
Semi-Scavenging Poultry Flock

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Summary

Defining semi-scavenging as a system in which poultry flocks are under partly controlled management and where the scavenged feed account for a significant part of the total feed eaten, the goes paper goes on to describe the Bangladesh Rural Advancement Committee (BRAC) model as it is organised in production, supply and service lines. The technology transfer approach of the model is briefly discussed. Data of recent field surveys and on-farm studies are used to undertake a financial evaluation. Factors affecting feed supply in a scavenging system are discussed using data from different locations. It is concluded the model is the most structured and most carefully designed available for smallholder poultry development, it has the potential to open new grounds in smallholder and scavenger poultry production. While the institutional set-up, structure and implementation procedure are well developed and documented, the technical part of the model needs still further documentation. However, there is no doubt that the model is viable, but also, that there is a great potential for technical improvements.

Key words: semi-scavenging, poultry, organisation, financial evaluation, location effect, technical improvement.

Introduction

The terminology semi-scavenging is used for small poultry flocks under partly controlled management and where the scavenged feed account for a substantial part of the total feed consumed. A Semi-scavenging Poultry Model (Saleque and Mustafa, 1996) is an integrated system to provide supplies and services to establish and to maintain a semi-scavenging poultry sector.

Scavenging poultry account for far the largest number of domesticated animals in the developing countries. Scavenging hens are, however, more or less neglected as an income generating activity by institutions as well as by the poultry holders themselves. The main activities to improve scavenging poultry holdings have been introduction of cockerel exchange programs and vaccination campaigns. However, the effect has been rather small because they have not been followed by other management activities.

¹ Proceedings of a Workshop edited by Frands Dolberg and Poul Henning Pedersen.
<http://www.kvl.dk/htm/php/tune.htm>

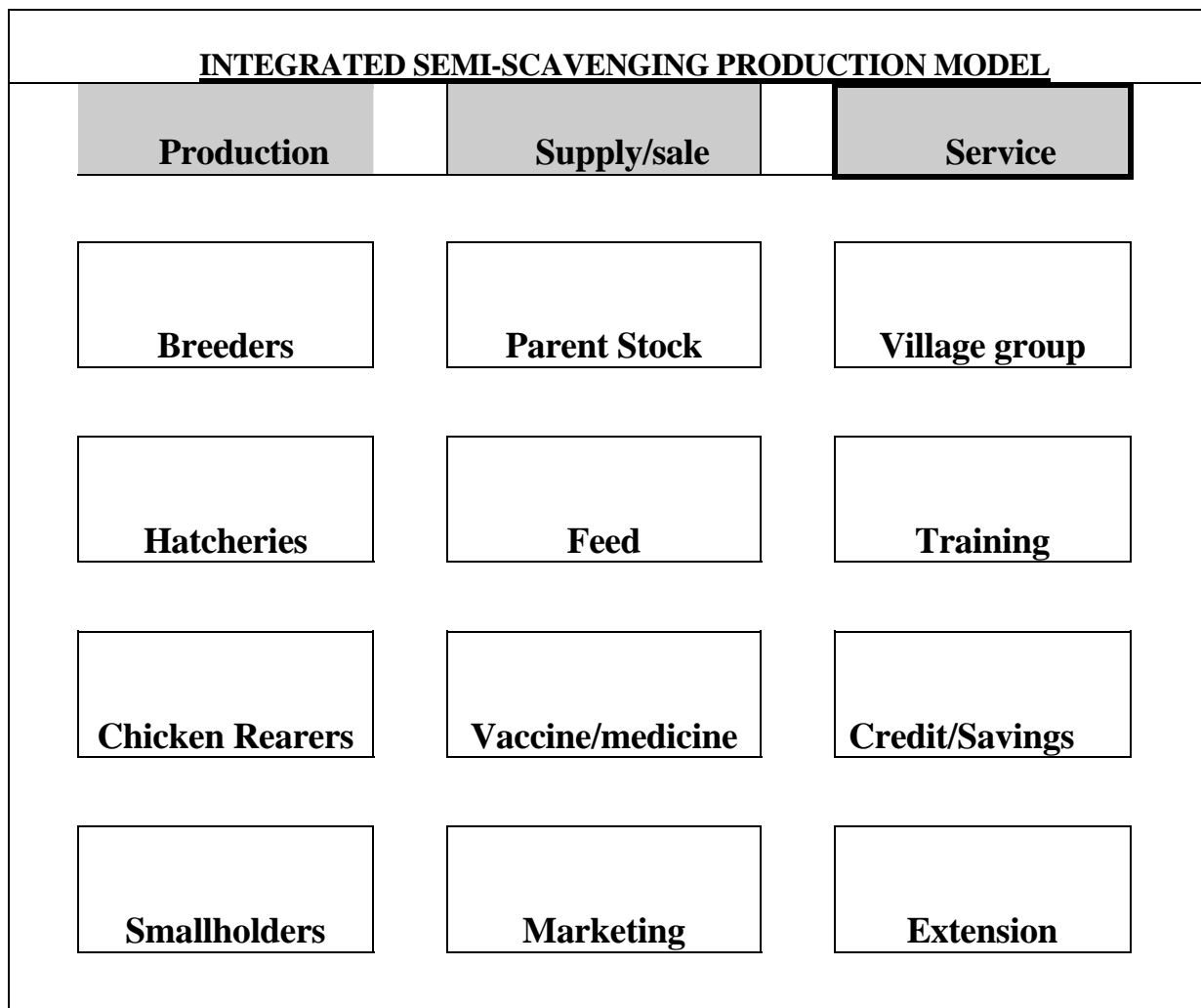
In Bangladesh there has, during the past decade, been developed a successful model for semi-scavenging poultry holding. In 1996 it was established more than 800,000 semi-scavenging smallholders and the number is now increasing with more than 100,000 per year.

The smallholder, the producer of the end product, constitute around 95% of the total number of small entrepreneurs involved in the model.

The Bangladesh model

Organization

The Model is a three pronged organization where each prong has its specialized functions. The institutional structure behind the Model is the Government through the Department of Livestock Services, DLS and NGO's, mainly Bangladesh Rural Advancement Committee (BRAC). In figure 1 is shown the three lines involved in the Model and the tasks of each line.



Production line

1. *Breeders (model rearers)*. Small low cost parent farms with 25 parent hens and cocks per farm. The hens are kept in confinement and fed with balanced feed. The Parent Stock are of improved breed such as White Leghorn, Rhode Island Red and Fayoumi and the males and females are of different breeds.
2. *Mini hatcheries*. Small low cost hatcheries operated with close to 100% solar energy. Black pillows filled with rice husk are heated in the sun and the eggs are placed in a cylinder between 2 pillows for hatching. Each hatchery has a capacity to hatch 1,000 chicken per month.
3. *Chicken rearers*. Small rearing farms, each with a capacity of 200-300 chicken. The chicken are reared in a low cost house from day old to 8 weeks of age. The chicken are fed with balanced feed supplied by the local feed seller.
4. *Smallholders (key rearers)*. Small farms with only 10 hens, mainly improved breeds supplied by the chicken rearers and a few Desi (local) hens. The hens are kept under semi-scavenging conditions and fed 30-70% supplemented feed and scavenge for the remaining part.

Supply line

1. *Parent stock*. The parent stock are supplied by the Directorate of Livestock Services to market price for day old chicken. The breeds are mainly Fayoumi, White Leghorn and Rode Island Red.
2. *Feed*. The feed is supplied by a number of small feed sellers located in the villages. The sellers purchase local by-products from the milling industry and mix it with fishmeal, vitamins and minerals. A feed seller sells about 1 ton of feed per month.
3. *Vaccine/medicine*. A number of poultry workers are trained to vaccinate the birds. The vaccine is supplied free of charge by the Government but the poultry workers charge a vaccination fee.
4. *Marketing*. The eggs are collected by egg collectors and marketed in the nearby towns or the poultry holders sell the eggs and chickens themselves in the village.

Service line

1. *Group formation*. The involved NGOs form small village groups with some 30 members. The groups hold weekly meetings to discuss relevant subjects and new poultry holders are selected from the groups.

2. *Training.* Before a poultry holder is established she has been through a 4 days training programme followed by refreshment courses.

3. *Credit.* Depending on the activities each member is provided with a small loan ranging from USD 25 to USD 200. The repayment period is 1 year.

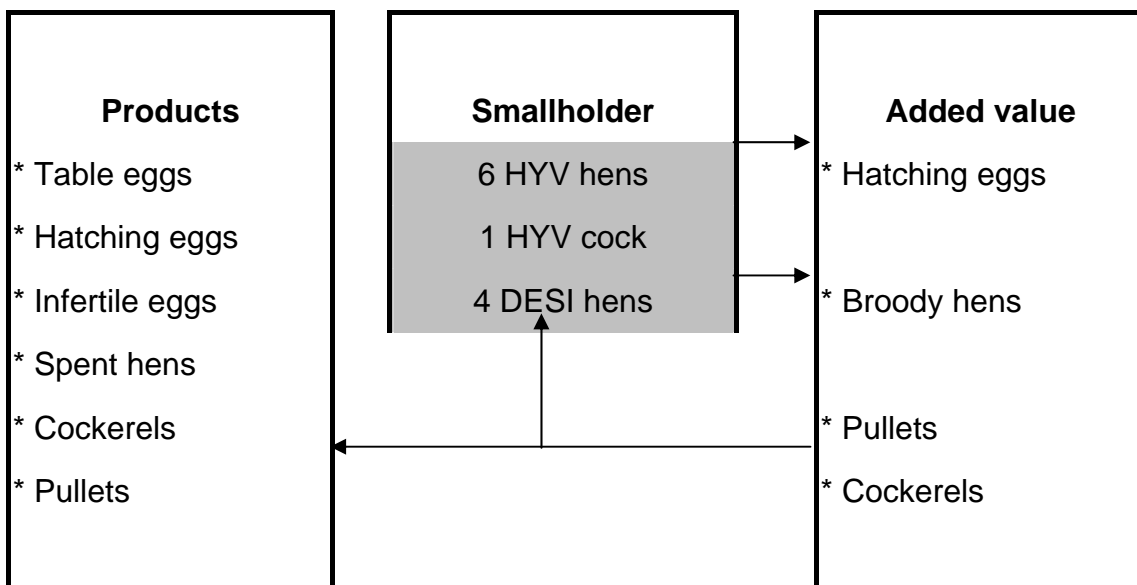
4. *Extension.* Extension services are provided as a cooperation between the Government and the involved NGOs.

The organization of the Model is well developed and well functioning. There is, however, a big gap on the technical side. The scientific resource base for semi-scavenging poultry holdings is rather weak and a professional network for this discipline is not established yet (Dolberg, 1996).

Smallholders

Smallholder structure

Smallholder flow



Smallholders constitute 95% of the units in the integrated model shown in figure 1. The sustainability of the model rely fully on the viability of the smallholders because all other links are established to serve the smallholders.

A smallholder unit is a rather complex operation and, even small in size, it comprises several activities as shown in figure 2. This complexity of activities makes it possible for the individual smallholder to adapt her operation to the prevailing market conditions and demand.

The use of Desi (local) hens as a value adding element for the eggs produced by the exotic hens is an essential activity in the smallholder set-up.

Transfer of technology

The structure of a smallholder unit does in many ways mirror an entire poultry sector with parent stock, hatchery, rearers and broiler and egg producers. The infrastructure is further supported by the supply and service functions which are an integral part of the model.

The concept behind the Bangladesh Smallholder Livestock Project implies that 10% of the population in the project area are directly involved as smallholders or in one of the supply and service activities. There is in this way an environment established for others to establish themselves within the poultry business. The smallholders' increasing standards of living serve as examples of the viability of poultry holdings and thereby establish the awareness of using poultry as an income generating activity.

Financial evaluation

The investment to establish a smallholder unit amounts to some US\$ 30 allocated as 50% to pullets and Desi (local) hens, 25% to housing facilities and 25% as working capital. The cash flow is positive from the first year of operation and the average annual profit is between Taka 3.000 and 6.000 or US\$ 75 to 150 (Alam, 1996).

In table 1 is shown the distribution of income and operation cost for a smallholder belonging to the Smallholder Livestock Development Project. The figures are from a survey planned by Hanne Nielsen (Nielsen, 1996) and conducted by Jahangir Alam (Alam, 1996).

Table 1. Distribution of income and expenditure per week

<i>Income</i>	<i>Amount (Taka)</i>	<i>Percentages</i>
Sale of egg	94.7	76.42
Sale of chicken	10.29	8.30
Home consumption of eggs	7.07	5.70
Home consumption of chicken	1.12	0.90
Other poultry income	10.74	8.66
<i>Total income</i>	123.95	100.00
<i>Expenditure</i>		
Feed	19.68	61.26
Transport	0.31	0.95
Medicine/vaccine	1.27	3.97
Labour	9.11	28.38
Others	0.09	0.28
<i>Total expenditure</i>	32.12	100.00

Source: Alam, 1996.

Another survey conducted in 1994 and mainly in Tangail District showed that income from sale of chicken is higher than indicated above (Jensen, 1995). Sensitivity analyses are presented in tables 2 and 3 of a smallholder with both exotic and Desi (local) hens. The parameters used in the analyses originate partly from surveys and partly from information provided by Bangladesh Rural Advancement Committee and cover a normal year of production.

Table 2. Sensitivity analysis for 6 HYV hens

			<i>Gross profit (Taka/year)</i>	
<i>Parameter</i>	<i>standard</i>	<i>variation</i>	<i>standard</i>	<i>+variation</i>
Egg yield, hd, %	50	+5	1066	+226
Age at lay, month	7	-1	1066	+202
Feed sup. rearing, kg	6	-1	1066	+56
Feed sup. lay. g/h/day	70	-10	1066	+184
Mortality rate, %	25	-5	1066	+68

Table 3. Sensitivity for 4 Desi hens

			<i>Gross profit (Taka/year)</i>	
<i>Parameter</i>	<i>standard</i>	<i>variation</i>	<i>standard</i>	<i>+variation</i>
Clutches per year	3	+1	2170	+703
Hatchability, %	67	+10	2170	+267
Mortality, chickens, %	50	-10	2170	+299
Mortality, adult, %	25	-5	2170	+30
Feed sup. g/hen/day	0	+10	2170	-158
Feed sup. kg/chicken	0.5	+0.25	2170	-116

Even though the main income seems to come from the Desi (local) hens it is stressed that income is based on hatching eggs from the exotic hens.

Location effect

The cornerstone in the semi-scavenging system is that scavenged feed constitute a substantial part of the total feed consumed. As such, there are two prerequisites to the system:

1. Scavenged feed shall be available in sufficient amounts.
2. Birds must have safe access to scavenge the feed available.

Sufficient feed available for scavenging depends on an area's carrying capacity influenced by factors such as cropping patterns and on the density of birds. Regarding the problem with density it can be solved in a manner seen in an location in Orissa, India, where each household maximum is allowed to keep 4 hens. Another method is to increase the amount of feed available for scavenging.

Predators are one of the main constraints met by scavenging poultry holdings. Especially young chicken below 8 weeks are vulnerable to predators which can account for more than 80% of the mortality.

Even though, the birds are kept in confinement as in the semi-scavenging model, predators are still a threat.

Performance data from three locations in Bangladesh are shown in table 4. A detailed description of the scavenging conditions at the three locations is under preparation. However, Manikganj is the area where the model has been developed and Bangladesh Rural Advancement Committee as well as the villages have experiences in this type of poultry holding, which may be the reason for the good results. Rajshahi is a typical sugar cane area with many predators and with scarcity of feed to scavenge.

Table 4. Location effect on performance, 6 to 11 months of age

<i>Traits/location</i>	<i>Jessore</i>	<i>Manikganj</i>	<i>Rajshahi</i>
Number of egg/hen	48	740	33
Mortality, diseases, %	19	11	16
Mortality, predators, %	1	0	8
Sup. feed g/bird/day	59	41	52

Conclusions

The Smallholder Model developed in Bangladesh is the most structured and the most carefully designed smallholder poultry programme in any developing countries. Chicken mortality has been brought down to an acceptable level and the resource consumption, mainly feed, seems even to be competitive with the intensive poultry production.

The model has a potential, apart from improving the living conditions of the smallholders, to open new grounds in smallholder and scavenger poultry production.

The institutional set-up, structure and implementation procedure are well developed and documented. The technical part of the model needs still more documentation of performance and structure of the operations. However, there is no doubt that the model is viable, but also, that there is a great potential for technical improvements.

Acknowledgements

The author is grateful to DANIDA and IFAD for funding the Smallholder Livestock Development Project in Bangladesh and to the staff of the Directorate of Livestock Services, Government of Bangladesh; Bangladesh Rural Advancement Committee and Bangladesh Livestock Research Institute for fruitful discussions and cooperation. Also thanks to the Technical Assistance Team: Frands Dolberg, Hanne Nielsen and Tamas Fehervari, for providing information and documentation materials.

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