

NOMADIC HERDED DUCK PRODUCTION AS A LIVELIHOOD TOOL IN SOME SELECTED AREAS OF BANGLADESH: A CASE STUDY

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Recently popularized nomadic duck production systems in Jamuna Floodplains of Sirajgonj and Pabna districts and the lower Padma basin in Faridpur and Madaripur districts were studied. Direct interviewing and FGD (Focus Group Discussion) was carried out to obtain required data for assessing the profitability of farming, feeding and management practices in the selected areas. The flock size varied from 146-687 number farmer⁻¹ depends on the economic base of each farmer. The farmers were categorized into three depending on their number of ducks farm⁻¹. Averaged price of each duckling was BD Tk. 25.55. Nomads usually moved from place to place for searching natural feeds enriched area from the start of monsoon to mid-autumn. During nomadic rearing, a lump sum amount of supplementary feeds such paddy, wheat and maize grains were supplied in the afternoon after day-long scavenging. The egg production was varied with seasons and availability of natural feeds. Economic analysis revealed that a farmer reared 285 ducks was obtained an gross return of Taka 330 450 per year. Non-availability of ducks vaccines and ducklings were the major problems identified in the nomadic duck production system in the areas. It may be concluded that nomadic duck farming is a profitable enterprise and is providing a huge contribution in family income, nutrition and overall livelihood of the farm families in the study.

Keywords: Ducks, nomadic system and livelihood

Duck population in Bangladesh comprises about 16.06% (48.86 million) of the total poultry population (304.17 millions) (Bangladesh Economic Review 2014) and

this handsome population is mostly rearing under scavenging and/or free-range systems. Along with other scavenging poultry species ducks plays a critical role in meeting daily protein needs and providing household income of farm families in the mixed farming systems of Bangladesh. It is considered to be the women's enterprise because about 80% female heads of the sampled rearers in rural areas hold the sole responsibility of rearing (Islam *et al.* 2016). Although a number of potential advantages, duck farming in Bangladesh is decreasing day by day (Islam *et al.* 2016) which could be due to scarce in scavenging areas and natural feed resources, drying up of natural waterbodies, excessive use of chemicals in crop fields, etc.

Transhumant and nomadic duck husbandry is a widely practiced in South and Southeast Asia. The duck flocks often migrated to nearby districts in search of fresh forage and water resources and the only job of the nomads is to forage the ducks and collect the eggs (Tamizhkumaran *et al.* 2013). In Bangladesh, nomadic duck production system has been popularized very recently in Jamuna Floodplains of Sirajgonj and Pabna districts and the lower Padma basin in Faridpur and Madaripur districts. The migration patterns of this nomadic duck rearing system depends on the availability of natural water bodies and feed resources. The present is directed towards identification of present status and technological practices followed by the nomadic duck farmers and to evaluate its impact as livelihood of the rural households.

MATERIALS AND METHODS

Study Site and Duration

A purposive survey was carried out in Jamuna Floodplains of Sirajgonj and Pabna districts the lower Padma basin in Faridpur and Madaripur districts among farmers having nomadic duck rearing system using a pre-designed questionnaire. The questionnaire was pre-tested and finalized. Data were collected on rearing practices, especially on farm family size, land, feeds and feeding systems, production systems, disease incidence, household income and expenditure, etc. Apart from the personal interviews, FGDs were conducted taking one session in each district to make qualitative analysis. The FGDs were to find out the impact of nomadic duck rearing on their socio-economic conditions and to find out effect of duck rearing on livelihood. A total of 38 nomadic farmers were selected. As the number of ducks per farm affects farmers' income (Huque *et al* 2001), the farmers in the survey were further categorized according to duck herd sizes. The total thirty eight nomads in different districts were divided into three categories having 100-250, 251-500, and above 500 ducks per farm. Data were edited, re-checked, and tabulated after processing. The analysis was done using descriptive statistics like percentage, frequency distribution, mean, and rank where appropriate in Microsoft Excel package.

RESULTS AND DISCUSSION

Farm and family size

About 52.6% farmers maintained ≤ 250 ducks, 36.8% had 250-500 and only 10.5% farmers hold above 500 ducks (Table 1). All the sampled farmers belong to small farm category according to land ownership (BBS 2005, Hossain and Nessa 2005) i.e. their landholdings were between 1.00-2.49 acres. Irrespective of farm size, the overall family size was 5.16 among the nomads. The distribution of duck raisers in relation to their land size is also shown in Figure 1.

Population dynamics

Table 2 indicates that cattle and goat heads decreased with the increment of duck population. This could be due to avoid management hazards with higher cattle/goat heads which is mostly dominated by the

male partners of the family. It means higher duck population simply lowers the availability of family labour for large animals. Results indicate that chicken population per household increased with the increased of number of duck per farm. Ducks population in different categories of farm size averaged 146.50, 369.25 and 687.50, respectively (Table 2).

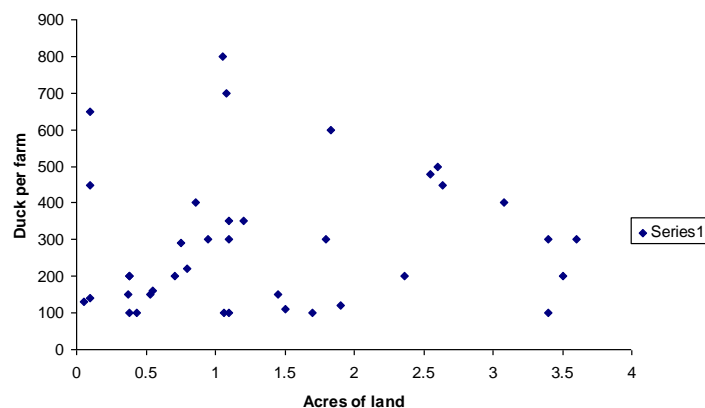


Fig. 1. Number of ducks per farm and the land size of the farms

Source of ducklings and feeding of ducks

It was observed that most (57-100%) of the farmers collected day-old ducklings from nearby local hatcheries (Table 3). The duck breed in the study area was Khaki Campbell. Large nomads (>500 ducks) were not involved in any sort of hatching of his own, although some medium (250-500 ducks) and very few small nomads hatched ducklings. This might be due to that fact that large nomads could not be able to pay extra labour for the hatching process. Price of ducklings averaged Tk. 25.55 which is almost in agreement with the present market price. They reported that about 66% of the sampled farmers purchased each duckling by BD Tk. 24-25. Large farmers spent less time in distant grazing that could be due to availability of natural feed resources in the particular area. However, irrespective of flock size, nomads reared the ducks on 4.62 months distant grazing, 5.20 months local foraging and 2.19 months confinement feeding in a year. Tamizhkumaran (2013) in a study found that duration for duck flocks in migratory places ranged from 3-4 months depending upon the rain fall and availability of harvested fields. The availability of natural feeds also varies season to season of the year. Findings indicate that naturals feed

Table 1. Farm and family information

| Parameter | Farm size | | | All farm |
|--|---------------|---------------|---------------|---------------------|
| | Up to 250 | 250-500 | Above 500 | |
| A. Farm family (No.) | 20 (52.6%) | 14 (36.8%) | 4 (10.5%) | 38 (100) |
| B. Farm size (Decimal farm ⁻¹) | | | | |
| i. Homestead | 10.25 | 23.50 | 14.00 | 15.53 (11.25) |
| ii. Pond/ditch | - | 20.21 | - | 7.45 (5.40) |
| iii. Cultivable land | 103.00 | 140.07 | 87.50 | 115.03 (83.35) |
| Total | 113.25 | 138.78 | 101.50 | 138.01 (100) |
| C. Family size (No. farm ⁻¹) | | | | |
| i. Male | 1.45 | 1.93 | 1.50 | 1.63 (31.59) |
| ii. Female | 1.35 | 1.86 | 1.25 | 1.53 (29.65) |
| iii. Child | 2.05 | 2.08 | 2.0 | 2.05 (39.73) |
| Total | 4.85 | 5.71 | 4.75 | 5.16 (100) |

Figures in the parenthesis indicate per cent of column total.

Table 2. Population dynamics (No. farm⁻¹) of household livestock and poultry

| Species | Farm size | | | All farm |
|--------------|---------------|---------------|---------------|------------------------|
| | Up to 250 | 250-500 | Above 500 | |
| Cattle | 2.30 | 3.71 | 1.75 | 2.76 (0.91) |
| Goat | 1.17 | 0.93 | 0.25 | 1.03 (0.34) |
| Chicken | 8.65 | 15.86 | 20.75 | 12.58 (4.17) |
| Duck | 146.50 | 369.25 | 687.50 | 285.53 (94.58) |
| Total | 158.62 | 389.75 | 710.25 | 301.90 (100.00) |

Figures in the parenthesis indicate per cent of column total.

Table 3. Information on ducklings and feeding

| Species | Farm size | | | All farm |
|---------------------------------|--|---|------------------|----------|
| | Up to 250 | 250-500 | Above 500 | |
| i. Source of ducklings | Loc. hat. – 85% Distant hat. 10% Own hat. – 5% | Loc. hat. – 57% Distant hat. 14% Own hat. – 29% | Loc. hat. – 100% | |
| ii. Price of ducklings (Tk) | 25.37 | 25.8 | 25.75 | 25.55 |
| iii. Grazing (months) | | | | |
| Distant grazing | 5.25 | 5.36 | 3.25 | 4.62 |
| Local grazing | 4.80 | 4.29 | 6.5 | 5.20 |
| Confinement | 1.95 | 2.36 | 2.25 | 2.19 |
| iv. Natural feed avail. (month) | | | | |
| High | 4.65 | 4.29 | 4.50 | 4.48 |
| Medium | 3.80 | 4.00 | 4.00 | 3.93 |
| Low | 3.55 | 3.71 | 3.50 | 3.59 |
| v. Laying frequency (month) | | | | |
| High | 6.10 | 5.93 | 5.75 | 5.93 |
| Medium | 3.00 | 3.07 | 3.75 | 3.27 |
| Low | 2.90 | 3.00 | 2.50 | 2.80 |

Loc. hat., Local hatchery

resources were abundantly availability about four and-a-half months in a year. Natural feeds were scarce on about three and-a-half months. Ducks laid highest number of eggs for a period of about six months usually from September-February (crop harvesting seasons). Due to scarce in natural feed resources ducks' egg laying frequency was

poor for a period of about four months (March-April and July-August). Some other researchers (Huque *et al* 2001, Islam and Sarker 1994a&b) also found higher egg production during crop harvesting season. The duration for the duck flocks remaining in the migratory places is two to three months time depending upon the availability

Table 4. Information on major duck disease outbreak

| Disease/problem | Time of outbreak |
|---------------------|------------------------|
| Duck Cholera | Round the year |
| Duck Plague | Autumn and spring |
| Respiratory problem | Round the year |
| Poisoning | Rice harvesting period |
| Bird flue | Winter * |

* One farm was affected last year

Table 5. Information of morbidity and mortality of duck (No. farm⁻¹ year⁻¹)

| Disease/problem | Farm size | | | | | |
|---------------------|---|--------------|----------|---------------|-----------|------|
| | Up to 250 | | 250-500 | | Above 500 | |
| | Affected | Dead | Affected | Dead | Affected | Dead |
| Duck Cholera | 18.00 | 8.75 (48.61) | 28.57 | 13.33 (48.66) | - | - |
| Duck Plague | 5.00 | 0.25 (5.00) | 42.86 | 4.93 (11.5) | - | - |
| Poisoning | 8.00 | 0.95 (11.88) | 10.71 | 0.71 (6.33) | - | - |
| Respiratory problem | A few are affected round the year and some of them die suddenly | | | | | |
| Bird flu | - | - | 32.14* | 32.14 (100) | - | - |

* One farm was affected last year, Figures in the parentheses indicate percent mortality

Table 6. Household income (BD Tk.) farm⁻¹ year⁻¹

| Sources of income | Farm size | | | All farm |
|--|----------------------|----------------------|----------------------|----------------------|
| | Up to 250 | 250-500 | Above 500 | |
| Crop production | 61750.00 (22.30) | 74428.57 (11.25) | 52500.00 (6.60) | 65447.37 (13.83) |
| Backyard livestock production | 23900.00 (8.63) | 40428.57 (6.11) | 41750.00 (5.25) | 31868.42 (6.73) |
| Backyard chicken production | 1252.00 (0.40) | 1642.86 (0.24) | 1500.00 (0.18) | 1422.11 (0.30) |
| Duck farming | 177892.50 (64.24) | 449516.07 (67.96) | 676500.00 (85.12) | 330449.34 (69.85) |
| Business | 8500.00 | 89642.86 | 22500.00 | 39868.42 |
| Service | - | 4285.71 | - | 4285.71 |
| Agricultural and non-agricultural labour | 3600.00 | 1428.57 | - | 2705.88 |
| Total | 276894.50 | 661373.21 | 794750.00 | 473055.66 |

Figures in the parentheses indicate percent of total income

of natural feed resources. Therefore, the year round egg production patterns was variable and which may be due to the availability feeds resources in the water bodies and feeds on the paddy harvested fields. In addition to foraging, farmers also supplied little amount grains such as paddy, whole wheat and maize to the ducks at afternoon adjacent to the night shelter.

All the farmers maintained their ducklings and also their ducks in a traditional manner i.e. night shelter was made temporarily and supplementary feed was not on scientific basis. Although tradition, the deficiencies was replenished by the abundant natural feed resources in the major half of the year.

Disease frequency

Most of the farmers reported that duck plague and duck cholera were the major diseases affect their flocks (Table 4). They also informed that during paddy harvesting season, poisoning of ducks was observed. Next to these diseases respiratory infection and bird flu were also noticed by the farmers.

Table 5 shows that mortality of ducks was high enough due to outbreak of duck cholera (48.00%) which contradict the finding of Tamizhkumaran (2013) who reported the ducks plague as major threatening disease. Farmers were aware of the vaccination. But they opined that even after applying duck cholera vaccine, they faced problem with

Table 7. Household expenditure (Tk.) farm⁻¹ year⁻¹

| Field of expenses | Farm size | | | All farm |
|--------------------|------------------|-------------------|-------------------|-------------------|
| | Up to 250 | 250-500 | Above 500 | |
| Food | 54500.00 | 75000.00 | 65000.00 | 63157.89 |
| Clothing | 4325.00 | 9285.71 | 6500.00 | 6381.58 |
| Health management | 5250.00 | 7428.57 | 14250.00 | 7000.00 |
| Education | 4550.00 | 21428.57 | 3000.00 | 10605.26 |
| Housing | 6650.00 | 13357.14 | 20500.00 | 10578.95 |
| Cosmetics | 1025.00 | 3535.71 | 1375.00 | 1986.84 |
| Land leased | 73750.00 | 167857.14 | 225000.00 | 124342.11 |
| Cost of restocking | 40000.00 (14.55) | 108571.43 (17.73) | 158750.00 (19.67) | 77763.16 (17.08) |
| Operating capital | 84750.00 (30.84) | 205714.29 (33.60) | 312500.00 (38.73) | 153289.47 (36.67) |
| Total | 274800.00 | 612178.57 | 806875.00 | 455105.26 |

Figures in the parentheses indicate percent of total income

duck cholera. No diseases outbreaks were reported in the flocks of large nomads' in the study area. This could be due to planned vaccination and deworming practices.

Contribution in the family income and livelihood of farmers

Sector wise contributions to total annual family income are presented in Table 6. Duck farming was the dominant sector of family income in all the farm categories and on an average it accounted for about 70% of the total. Trends indicate that higher farm size (number of ducks) contributed more to the annual family income. The second highest contribution came from crop sector in all the categories. Results indicate that duck farming was the single largest income source for the livelihood of the farm families in the selected localities.

Household expenditure

Household expenditure patterns revealed that farmers usually maintained some capital for restocking of ducklings for the next year (Table 7). Other than an operational expenditure during brooding and rearing, disease control and supplementary feeds, farmers also invest on an average 36 % of their household income for continuation of the flock. Higher expenses in education in the farms having 250-500 ducks may be due to the higher expenses of tuition fees and other costs for their children.

Constraints faced by the farmers

Problems faced by farmers were ranked from 1-4 based on their perception. Lack of technical knowledge, inadequate supply of quality ducklings and vaccines, disease outbreak, and unavailability of ready feed

were the major problems noticed by the respondents. Farmers reared above 500 ducks opined that lack of reliable worker and unavailability of commercial feed were the major problems for them.

CONCLUSION

Since the nomadic duck production is still on a traditional system, hence, location specific technological interventions are to be carried out to refine the existing practices. Among the diseases, duck plague and duck cholera only causing heavy damage which could be reduced sharply by vaccinating the birds. There are great potentials for an improvement of duck production systems if some constrains could be conquered. The most noticeable constrains are inadequacy in quality ducking and vaccines and lack of technical knowledge in the study area. Regular vaccination and use of balanced supplementary diets may have a great effect on duck rearing by providing quality products for human consumption and reducing nutritional deficiencies and poverty reduction. Per annum return from the farm families indicate that nomadic duck farming may be a profitable business.

Government initiatives for organized technological training on duck production practices along with the assurance of availability of quality ducklings and vaccines might have a reflective influence on increased duck population in Bangladesh. If the arrangements could be done, this enterprise may act as an effective tool for

livelihood and food security of the farm families.

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