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Ending the Cycle of Undernutrition in Bangladesh

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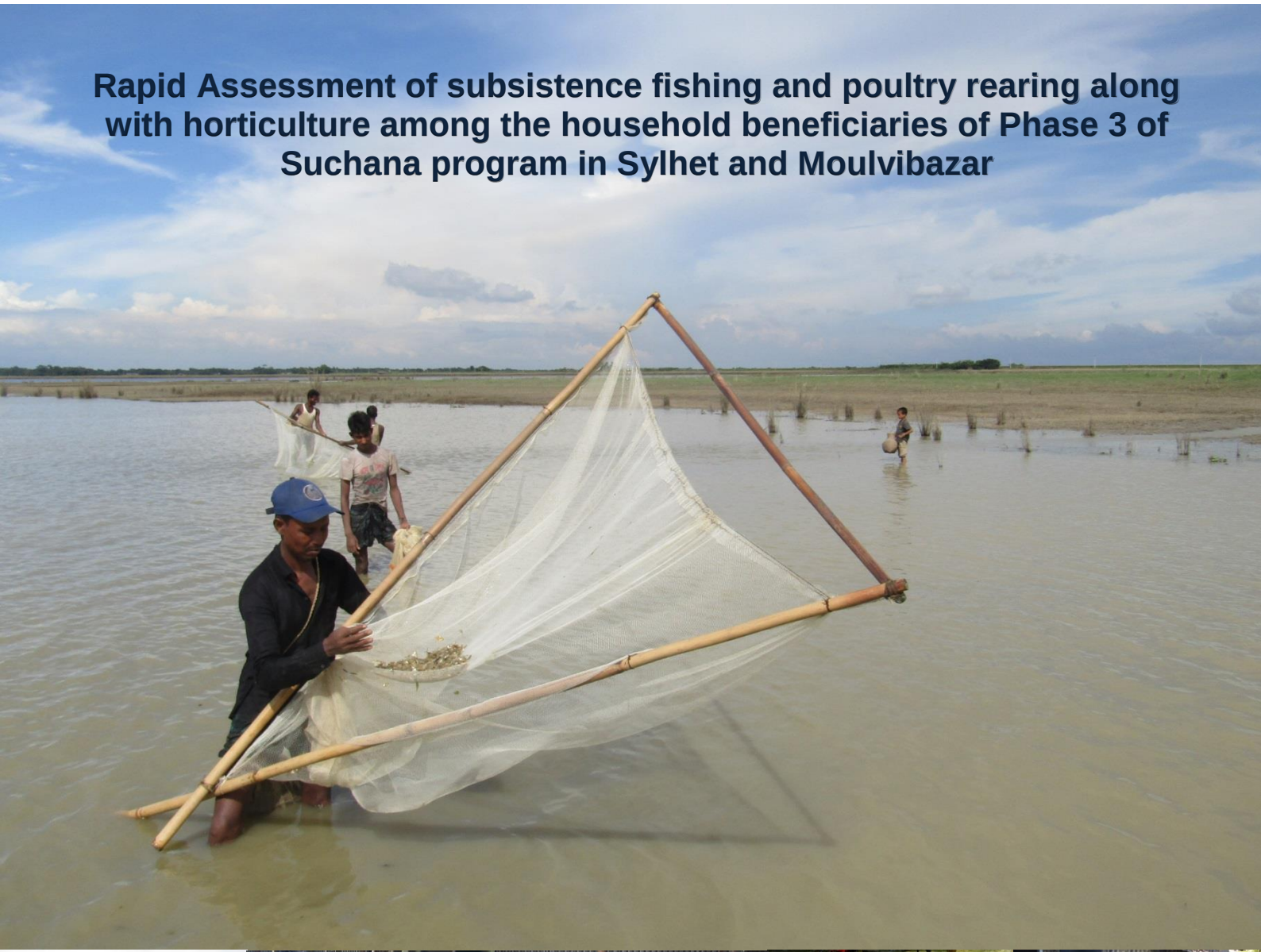
Rapid Assessment of subsistence fishing and poultry rearing along with horticulture among the household beneficiaries of Phase 3 of Suchana program in Sylhet and Moulvibazar







CNRS FIVDB আরডিআরএস বাংলাদেশ RDRS Bangladesh Save the Children Helen Keller INTERNATIONAL icddr,b iDE WorldFish

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Summary

Suchana: Ending the cycle of undernutrition in Bangladesh is a multi-sectoral nutrition program that aims to achieve a significant reduction in stunting amongst children under two years of age in Sylhet and Moulvibazar districts of Bangladesh by catalyzing support across government and other stakeholders. Suchana has adopted an integrated approach delivering both nutrition specific and nutrition sensitive interventions to prevent chronic malnutrition within the critical first 1,000 days of a child's life. The program is led by Save the Children and involves WorldFish, HKI, IDE, icddr,b, CNRS, FIVDB and RDRS as consortium partners. DFID and the European Union are providing the financial support.

Besides the promotion of nutrition-sensitive fish and vegetable production systems, WorldFish is also supporting on subsistence fishing opportunities at the beneficiary households of Suchana program especially those households didn't have access to pond but have access to fishing at nearby open water. Small-scale poultry rearing was also integrated there based on interest and feasibility of individual household. Fishing is one of the most ancient livelihood options. Still, it is very effective and popular to many households globally. Based on statistic from Department of Fisheries, capture fisheries contributed 28.45 percent to total national fish production in 2017-18. Sylhet is one of the leading regions for inland capture fisheries areas in the country. Besides plethora of the ponds and ditches, numbers of rivers, canals, haors, beels and floodplains are also available there. So, larger proportions of households have access to fishing there.

Up to November 2019, a total 4,354 BHHs have received subsistence fishing related supports besides the common horticulture package including training and some essential inputs. Out of those, 331 BHHs have received supports on only subsistence fishing, 16 BHHs have received supports on subsistence fishing and fish drying, and 4,007 BHHs have received supports on subsistence fishing and small-scale poultry rearing. As a pilot initiative, WorldFish conducted a rapid assessment to capture the level of outcomes from the interventions of subsistence fishing and related supports. It was mainly a quantitative survey following rapid assessment methodologies where total sample size was 90 BHHs. As there was no baseline assessment of these households, no comparisons was possible with the current findings.

Based on study findings, there was very encouraging progress in harvesting and usage of fish, poultry birds (chicken and duck), eggs and vegetables at the beneficiary households. They harvested diversified species of fish, and collected good numbers of eggs and wider varieties of vegetables; and more importantly a good proportion of their harvests, they used for their family consumption. It has also strong reflections on dietary diversity of reproductive age women. More than half (57.8%) of the reproductive age women (including the mothers of the children less than 2 years of age) at the beneficiary households of subsistence fishing had diversified diets within one year of Suchana interventions.

On an average 269 Kg of fish was harvested per beneficiary household in last 1 year. Out of those, 42% (114 Kg) was used for family consumption, 48% (129 Kg) was sold at the markets, 6% (16 Kg) used for producing dry fish and only 4% (10 Kg) was gifted to the relatives and neighbors. Within last 1 year, they reared 21 birds per households. It was included both chicken and ducks. Out of 21 birds, 7 (33%) was continued under the rearing process at the point of visit, 6 (27%) were used for table purposes of the family members, 4 (19%) were sold, 0.2 (1%) were gifted to relatives and neighbors, and 4 (19%) were died. Similarly on an average 101 eggs were collected per households from the homestead poultry from their chickens and ducks.

Out of 101 eggs, 59% (59 pieces) was consumed by the family members, 20% (20 pieces) was sold, 19% (19 pieces) was used for producing poultry birds through household level hatching practices using local hens, and only 1% (1 piece) was damaged. Average vegetable harvest was 144 kg per BHH. Almost three-quarter (74%) of harvested vegetables was used for family consumption averaging 106 kg. A small portion e.g. 10 kg (7% of total harvest) were gifted to their relatives and neighbors, and 19% of the harvest (50 kg) was sold to the neighbors and local markets.

The value of total harvest and production of fish, poultry birds and eggs was 60,927 BDT per BHH. Out of 60,927 BDT, the major contribution 56,261 BDT was from fish; and remaining 3,692 BDT and 974 BDT from poultry birds and eggs respectively. Out of those, 28,453 BDT was from direct income by selling the produces. Most of the households used the income by selling their fish and poultry for purchasing other food items (96% of BHHs), clothes (87%) and medicines (82%) and for children's education (76%).

Overall 91% respondent households expressed either satisfied (66%) or very satisfied (25%) after receiving the supports on either only subsistence fishing or subsistence fishing or small-scale poultry rearing in addition to the vegetable production system. Despite high level of satisfaction in receiving supports of subsistence fishing, small-scale poultry rearing and vegetable gardening; the BHHs also faced some challenges regarding their fishing and production practices. The key challenges were restriction from the representatives of lease holders or land owners, less fish available compare to earlier, theft of gears, natural hazard like storm, heavy raining, and excessive cold for the fishing. The highest proportion (71%) of the respondents mentioned 'attacking of poultry diseases' as one of the major problems for their poultry birds. Other challenges were attacking of wild animals, excessive cold in winter, shortage of quality vaccination and medicine, shortage of poultry feed and some natural calamities.

Therefore, further attention should be required to improve their fishing and production practices of poultry. Some co-management oriented initiatives for introducing a short ban period of fishing especially protection of naturally grown fish fry and strengthening of linkages between lease holders and fishers can be effective to enhance the sustainable growth of inland fisheries and fishing. Improving the poultry shed and strengthening the coverage of vaccination for the poultry birds following the recommended vaccination schedules, use of supplementary feeding and other improved rearing practices can be more effective.

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1. Background

Suchana: Ending the cycle of undernutrition in Bangladesh is a multi-sectoral nutrition program that aims to achieve a significant reduction in stunting amongst children under two years of age in Sylhet and Moulvibazar districts of Bangladesh by catalyzing support across government and other stakeholders. Suchana has adopted an integrated approach delivering both nutrition specific and nutrition sensitive interventions to prevent chronic malnutrition within the critical first 1,000 days of a child's life. The program is led by Save the Children and involves WorldFish, HKI, IDE, icddr,b, CNRS, FIVDB and RDRS as consortium partners. DFID and the European Union are providing the financial support.

WorldFish is mainly promoting nutrition-sensitive fish and vegetable production systems to the beneficiary households (BHHs) of the Suchana program. The Suchana program has a planned sequencing of intervention support where each union receives intensive support for the first year, technical and behavioral change support continued in the second year, and follow-up and monitoring up to the third year. After end of third year, the beneficiary households are being phased-out. A total of 235,500 beneficiary households from 158 unions of 20 upazilas are being received support through 4 phases over the project period since 2017 to 2022. It is anticipated that 30% of beneficiary-households would have access to ponds or other small water-bodies and would receive support on nutrition-sensitive fish production along with vegetable production and behavioral change messaging on nutrition. This includes technical training, coaching, inputs (lime, fish fingerlings and fish feed for fish culture; seeds, seedlings and cuttings for vegetables), and linkages with local market actors and service providers from both public and private sectors. Fish production focuses mainly on carp and tilapia poly-culture along with small indigenous fish species (SiS) including 'mola' using improved management practices.

Prospects of fishing

Fishing is one of the most ancient livelihood options. Still, it is very effective and popular to many households globally. Fish is one of the common diets and major source of animal protein, contributing 60% of animal protein in Bangladesh (HIES, 2010). Fish is the most frequently consumed animal-source food across all social strata, as well as the most frequently consumed nutrient rich food (Toufique & Belton, 2014). However, while there are many variations in terms of frequency, amount, and quality of consumption, particularly among poor households.

According to FAO report The State of World Fisheries and Aquaculture 2018, Bangladesh ranked 3rd in inland open water capture production and 5th in world aquaculture production. Currently Bangladesh ranks 4th in tilapia production in the world and 3rd in Asia. In 2017-2018, inland culture fisheries contributed 56.24 percent to total national fish production and inland capture fisheries contributed 28.45 percent (DoF 2018). Sylhet is one of the leading regions for inland capture fisheries areas in the country. Besides the ponds and ditches, numbers of rivers, canals, haors, beels and floodplains are also available there. So, larger proportions of households have access to fishing there.

Considering the expectations from the beneficiary households (BHHs) and local potentialities, WorldFish is also supporting on subsistence fishing opportunities integrating with small-scale poultry rearing especially those households don't have access to pond but have access to fishing at nearby open water. It is expected that these integrated supports will also enhance the

availability and accessibility of nutrition-sensitive vegetable, fish and poultry products at the beneficiary households of Suchana using the same amount of financial supports.

Table 1: Different types of intervention relate to subsistence fishing

Sl	Type of Interventions	CNRS	FIVDB	RDRS	Total
1	HFP- Subsistence Fishing only	180	101	50	331
2	HFP- Subsistence Fishing and Poultry	2,132	572	1,303	4,007
3	HFP- Subsistence Fishing and Fish processing	0	4	12	16
	Total	**2,312**	**677**	**1,365**	**4,354**

Table 1 shows that up to November 2019, a total 4,354 BHHs have received subsistence fishing related supports besides the common horticulture package including training and some essential inputs. Out of those, 331 BHHs have received supports on only subsistence fishing, 16 BHHs have received supports on subsistence fishing and fish drying, and 4,007 BHHs have received supports on subsistence fishing and small-scale poultry rearing. This is one of the especial initiatives as pilot; therefore, WorldFish conducted a rapid assessment to capture the level of outcomes from the interventions of subsistence fishing and related supports.

1.1 Objectives of the study

The main objective of the study to analyze the performance of subsistence fishing and poultry rearing along with the horticulture interventions; It also focused the capturing fish and producing poultry (eggs, chicken & ducks) and vegetables, and its uses.

1.2 Specific objectives of the study

- To analyze the harvest/ production, consumption and sales of fish, vegetables, and poultry birds and eggs at the beneficiary households of Suchana selected for subsistence fishing;
- To capture the diversity in the diet among the reproductive women/mothers;
- To identify the strengths and challenges faced by the households are involved within the interventions;
- To document the ongoing and potential challenges, and program responses over the course;
- To explore the overall learning and the future potentialities the interventions for the targeted communities;


2. Methodology

It was mainly a quantitative survey based rapid assessment. A set of well-structured questionnaire was used for the survey focusing the quantitative indicators along with some categorical information from the beneficiary households. As there was no baseline assessment of these households, no comparisons have been presented with the current findings.

2.1 Sample design

Considering the limitation of financial and human resources, and management decisions, total sample of 90 beneficiary households (BHHs) were interviewed especially those received the targeted interventions. A total 30 BHHs were selected from each of the implementing partners' working areas. Out of these 30 BHHs, 10 were selected from the BHHs those have received subsistence fishing only; and remaining 20 BHHs were selected from the BHHs those have received integrated supports including subsistence fishing and small-scale poultry rearing. Stratified random sampling technique was followed to select the 30 BHHs from each of the implementing partners.

2.2 Process of the study

Considering the limitation of resources, existing technical team members and MEAL personnel from WorldFish, Helen Keller International (HKI), Save the Children, CNRS, FIVDB and RDRS have collected the primary data and relevant information from the field. They have taken necessary supports from respective team members from other technical partners and implementing partners at the field levels. Data was collected in January 2020. Data analyst of WorldFish was responsible to develop the data entry package. A temporarily recruited Data Entry Operator entered the data. M& E Specialist of Suchana from WorldFish is responsible to lead the overall the study including the preparing concept note, tools (questionnaires and check lists), capacity building, final data processing and analysis, and developing the reports. The team has also received the necessary guidance, review and editing supports from the Project Manager/ team leaders and other senior team members of Suchana from Save the children and WorldFish. Besides the primary information, available secondary information from the existing documents, database and relevant publications have also been used for the study.

2.3 Limitation of the study

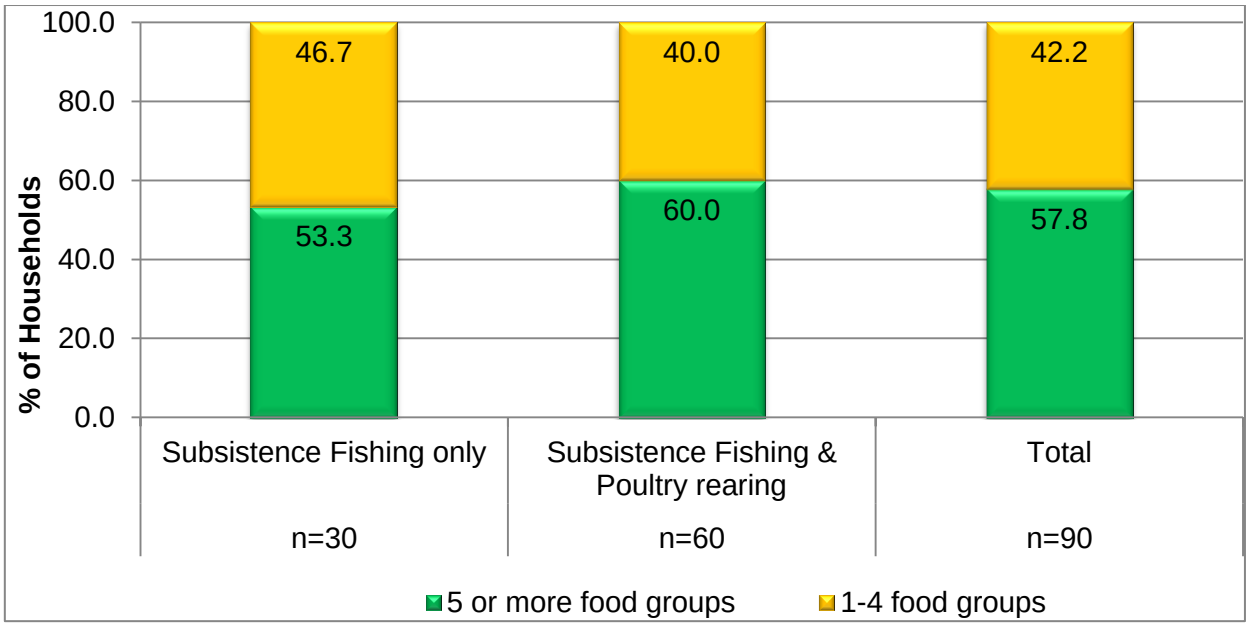
The sample size is only 90 intervention households for quantitative data. So it is not the statistically validated number. Project personnel including technical team members who were responsible for implementation might be bias while recording the data. This was tried to overcome by exchanging different areas and involving the staff members from other consortium partners. Moreover, no baseline was available to compare the current findings as this intervention was under taken from the phase-3 as pilot. Still, it is expected that it will give the good lessons for the program and senior management teams about the progress towards achieving the intendent outcomes of Suchana. It can also be a good learning document to improve the future initiatives and decision making.

3. Results and discussion

3.1 Dietary diversity of reproductive age women including the mothers

Figure 1 shows that more than half (57.8%) of the reproductive age women (including the mothers of the children less than 2 years of age) at the beneficiary households of subsistence fishing had diversified diets within one year of Suchana interventions.

Figure 1: Proportion of reproductive age women consumed diversified diets

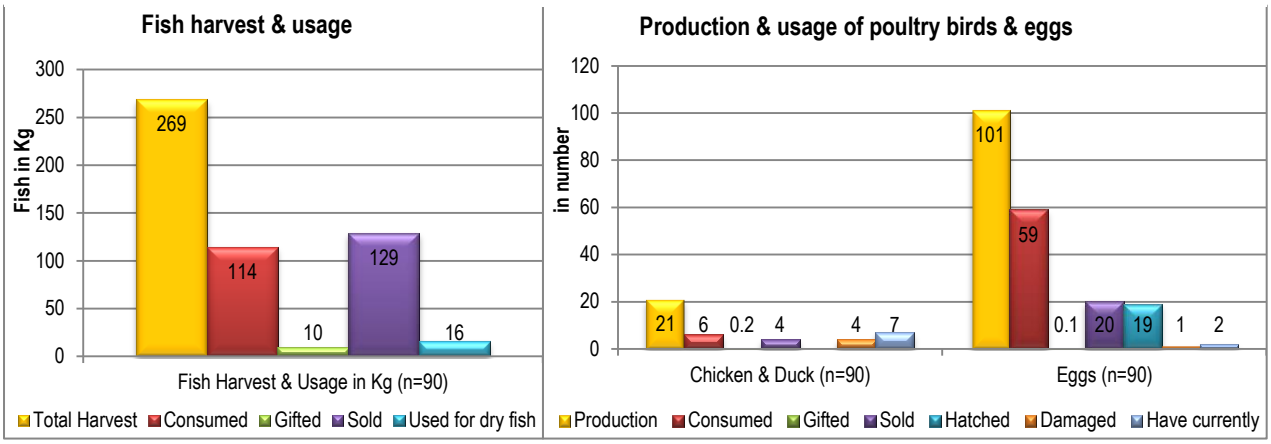


Out of the sample households, more proportions of women had diversified diets at the subsistence fishing and poultry rearing supported households (60.0%) compare to the only subsistence fishing households (53.3%); although most of the households of both categories had poultry rearing. It may be from their own initiatives only or may be combinations of Suchana supports and their own initiatives. Actually, the households received supports from Suchana based on the interest and local feasibility of individual households. These households have also received different nutrition specific interventions including courtyard sessions and counselling on nutritional practices.

Rahela Begum, her husband Nur Ahmedand 2 sons after fishing from the river at Gouripur village of Tukerbazar

3.2 Harvest/ Production and usage of fish and poultry products

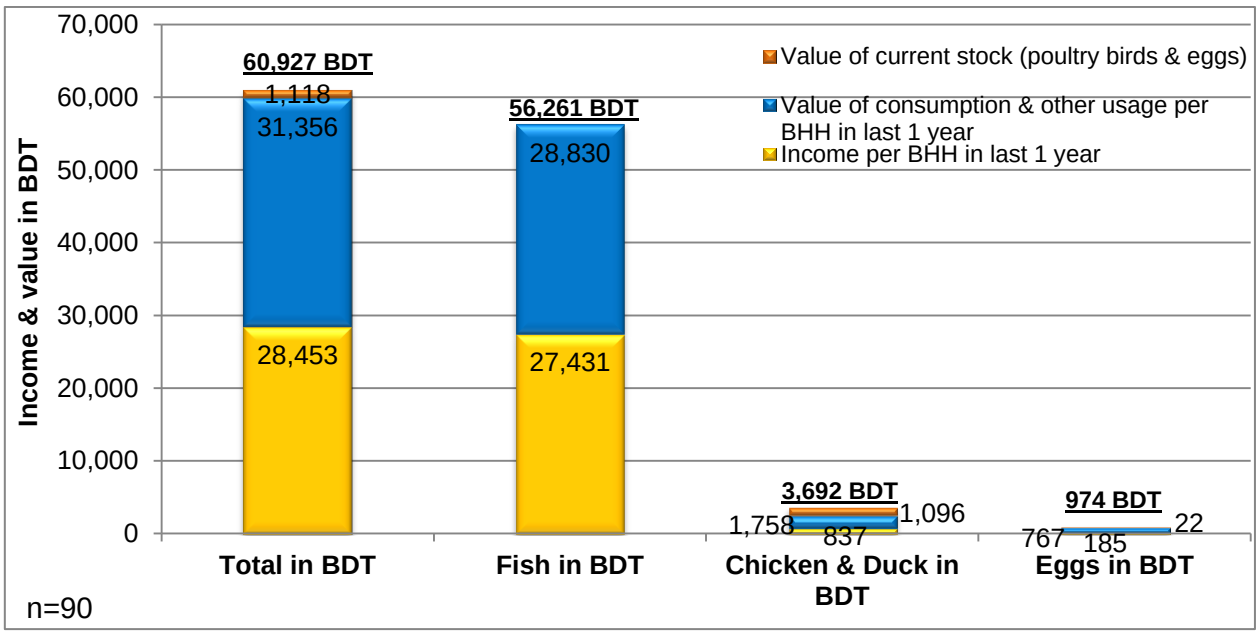
Figure 2: Harvest/ production and usage of fish and poultry products in last 1 year



Very attractive amount of fish was captured and poultry products were produced. Figure 2 shows that on an average 269 Kg of fish were harvested per beneficiary household in last 1 year. Out of those, 114 Kg (42%) was used for family consumption, 129 Kg (48%) was sold, 16 Kg (6%) was used for producing dry fish and only 10 Kg (4%) was gifted to the relatives and neighbors.

Within last 1 year, they reared 21 birds per households. It was included both chicken and ducks. Out of 21 birds, 7 (33%) was continued under the rearing process at the point of visit, 6 (27%) were used for family consumption, 4 (19%) were sold, 0.2 (1%) were gifted to relatives and neighbors, and 4 (19%) were died. Similarly on an average 101 eggs were collected per households from the homestead poultry from their chickens and ducks. Out of 101 eggs, 59 pieces (59%) were consumed by the family members, 20 pieces (20%) were sold, 19 pieces (19%) were used for producing poultry birds through household level hatching practices using local hens, and only 1 piece (1%) was damaged.

Figure 3: Value of fish, chicken, duck and eggs in last 1 year and current stock



Based one figure 3, the value of the total harvest and production of fish and poultry products including poultry birds and eggs was 60,927 BDT per BHH. Out of those, 28,453 BDT was from direct income by selling the produces, and the estimated value of consumption and other usage

(gift, producing dry fish and hatching of eggs) were 31,356 BDT; and 1,118 BDT was the value of current stock in hand or under current rearing process. Out of 60,927 BDT, the contribution of fish, poultry birds (including chickens and ducks), and eggs were 56,261 BDT, 3,692 BDT and 974 BDT respectively.

Sultana is exposing her dried fish in sun as for quality assurance at Fatepur of Mogolgaon union

Sultana is exposing her dried fish in sun as for quality assurance

3.3 Major characteristics of subsistence fishing

3.3.1 Involvement of family members in subsistence fishing

The family size of the sample households was 6.2; that was 6.9 at the households received subsistence fishing supports only and 5.9 for the households those received supports for both the subsistence fishing and poultry rearing.

Table 2: Average family members were involved in subsistence fishing in last 1 year

Involvement of family members in fishing	Subsistence Fishing only	Subsistence Fishing & Poultry rearing	Total
	n=30	n=60	n=90
Family size	6.9	5.9	**6.2**
Men	1.4	1.4	**1.4**
Women	0.3	0.3	**0.3**
Men & women	1.6	1.7	**1.7**

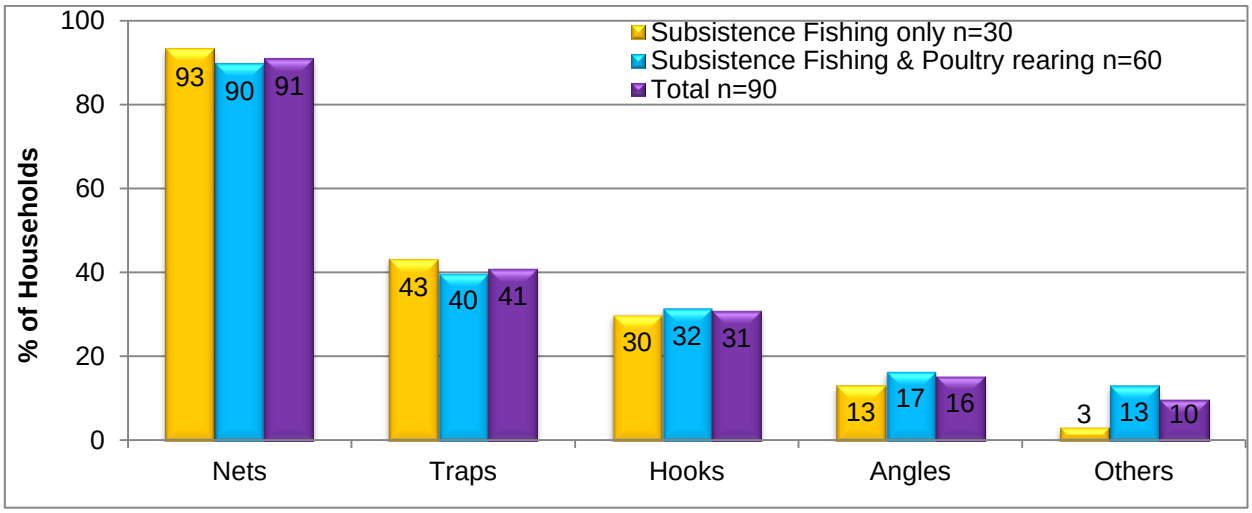
On an average 1.7 family members including the men and women were involved with the fishing. It was 1.4 persons of men and the remaining 0.3 person from women. Actually, most of the men were involved in direct fishing and most of the cases women played supporting roles besides some direct fishing as most of the fishing required to go down within the water bodies. The supporting roles were preparing the nets/gears, collecting the fish from the gears, processing of dry fish and some others.

3.3.2 Major gears and equipment/ materials used for your fishing

On an average each beneficiary household used about two types of gears. Almost half (47%) of them used one gear and remaining households used 2 to 4 types of gears. More than ninety percent of the beneficiary households used nets for fishing. The second highest proportion (41%) of households used different type of traps, 31% of the households used hooks (locally

called borshi), 16% of the households used angles like teta, thurkus and jut etc. One tenth (10%) of the households also used few other gears especially one kind of bamboo traps locally called polo. (Figure 4)

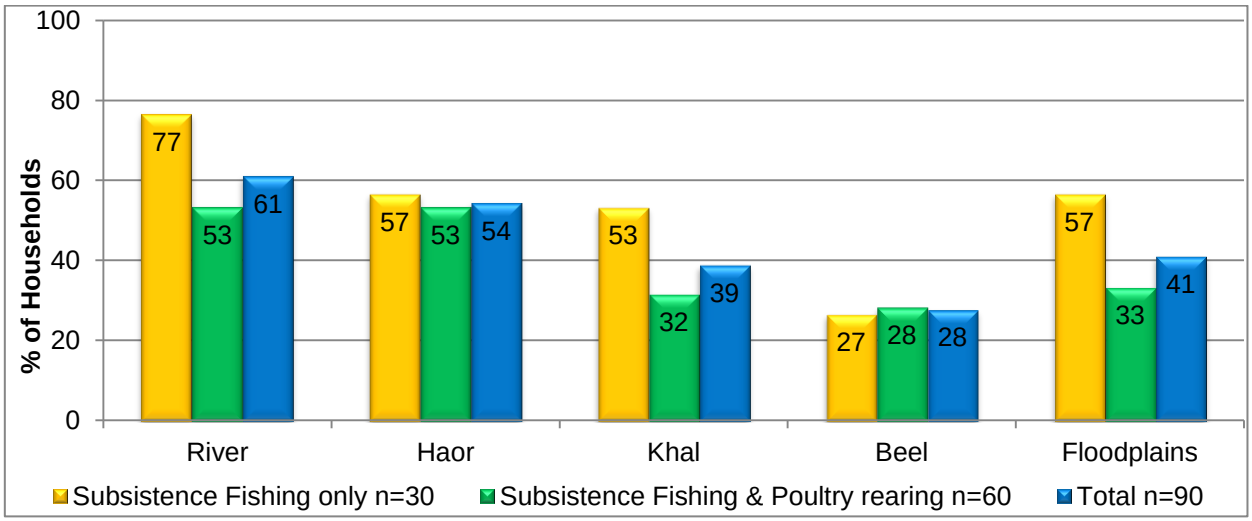
Figure 4: Proportion of BHHs used different gears for fishing in last 1 year



Mother of Mariam Akhter is harvesting fish at rice field of Balichiri village at Kulaura sadar union

3.3.3 Major fishing locations and water bodies

Figure 5: Proportion of BHHs used different fishing locations



Most of the households harvested fish from two to five types of water bodies. Only 20% percent households harvested fish from single locations. Highest proportion (61%) of the households harvested fish from rivers. The second highest (54%) proportion of the households harvested fish from haor. The other locations were Khal (39%), beel (28%) and other flood plains (41%) including rice fields.

3.3.4 Duration of fishing and number of species harvested

Actually most of the fishing areas are under the control of local elites and that may be through legal entity by leasing process from the respective public departments or may be through power plays. So most of poor fishers have to give some tall or maintain a negotiation process with local lease holders of controlling authorities or their representatives.

Table 3: Average duration of fishing and no. of species harvested in last 1 year

Fishing duration and no. of fishing	Subsistence Fishing only	Subsistence Fishing & Poultry rearing	Total
Fishing months (in number)	6.4	5.9	6.0
Fishing days (in number)	140	103	116
No. of Fish Species (in number)	15	13	14

Usually, small fishers get limited permission from the local authorities during rainy season and it is highly restricted during winter as main lease holders catch the more fish especially in dry season when water goes down. On an average, Suchana supported household harvested fish in 116 days within 6 months in last 1 year.

Figure 6: Proportion of BHHs involved in fishing at different months in last 1 year

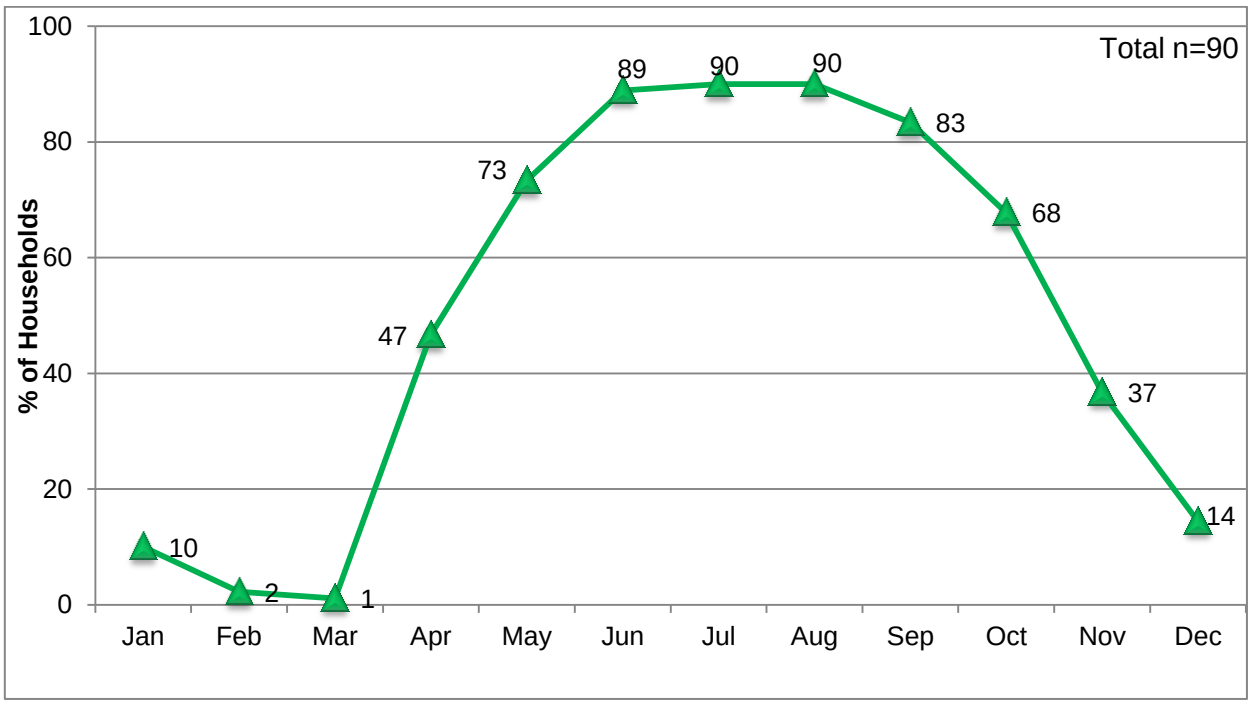
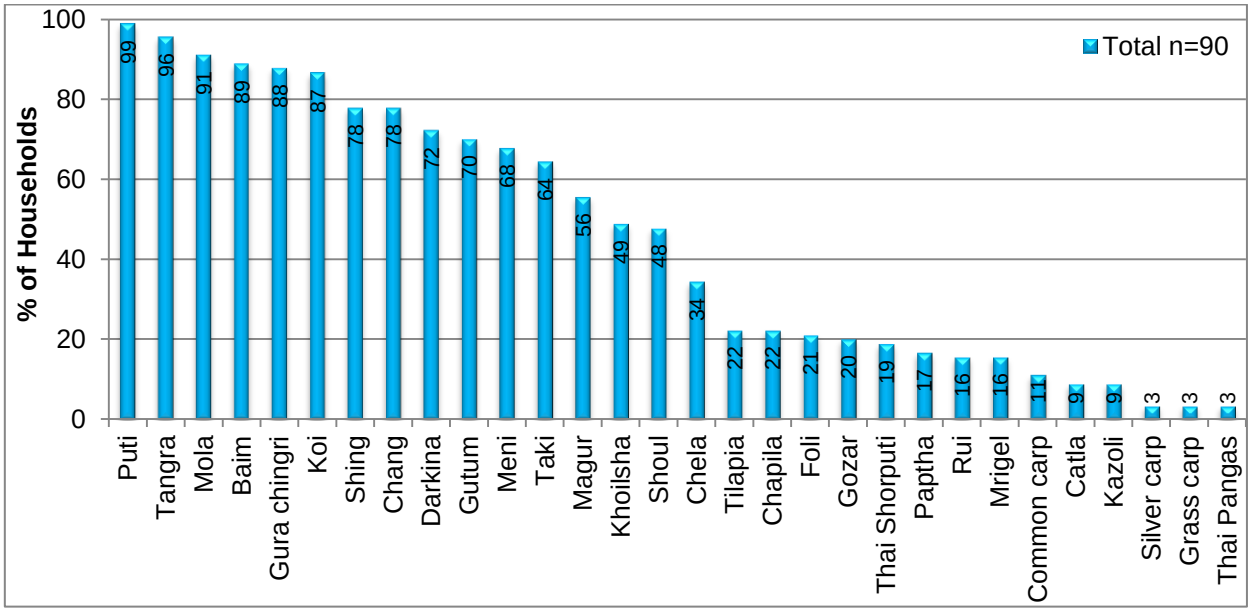


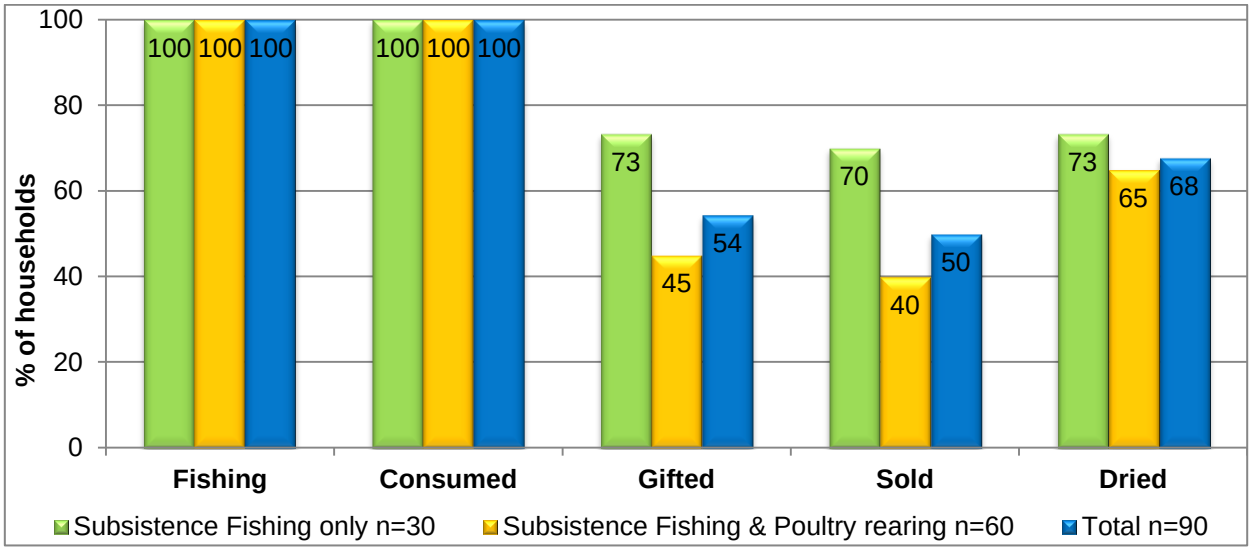
Figure 6 shows that most of the suchana supported households involved in fishing since April to November. Around ninety percent of households performed fishing during June to August in last 1 year.

Figure 7: Proportions of BHHs harvested different species of Fish in last 1 year



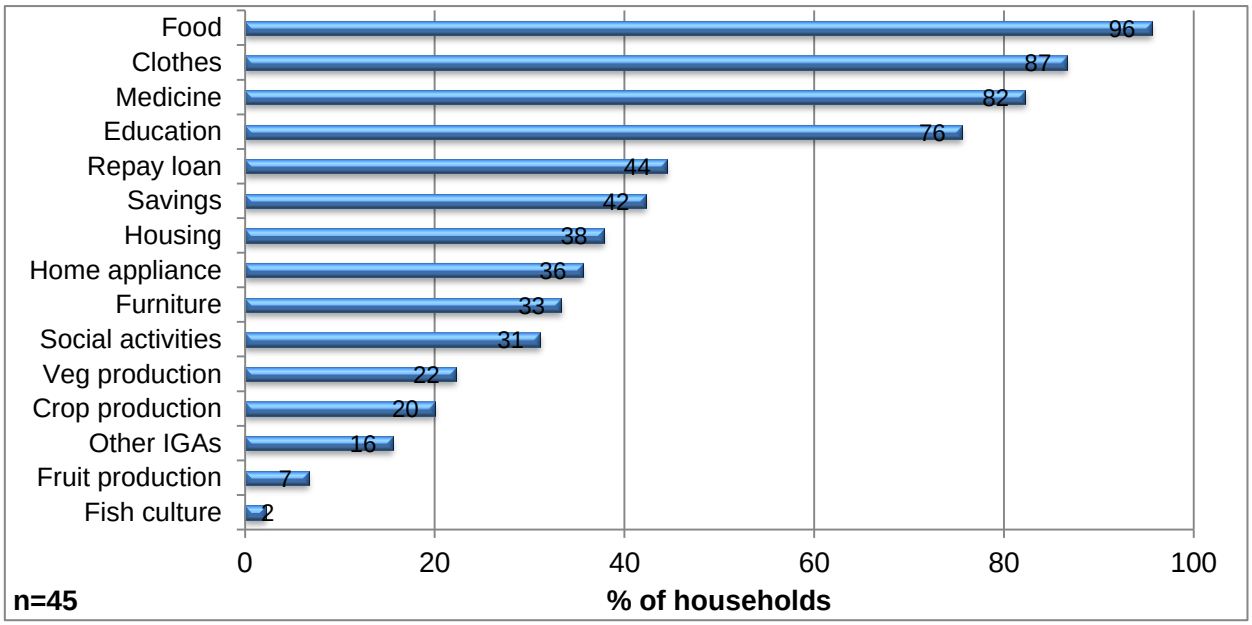
Based on figure 7, average 15 species of fish was harvested by Suchana households and it varies from 7 to 24 species per households. Most common 6 species were Puti, Tangra, Mola, Baim, Gura Chingri, and Koi. More than eighty percent (87% to 99%) of the households harvested these species. Around 60% to 80% of the households harvested other 6 species and those were Shing, Chang, Darkina, Gutum, Meni, and Taki. The other species were Magur, Khoilsha, Shoul, Chela, Tilapia, Chapila, Foli, Gozar, Thai Shorputi, Paptha, Rui, Mrigel, Common carp, Catla, Kazoli, Silver carp, Grass carp and Thai Pangas.

Figure 8: Proportion of BHHs used their fish for different purposes in last 1 year



Every household used their harvested fish for their family consumption. More than half (54%, 45%-73%) of the households gifted their harvest fish to their neighbors and relatives. A half (50%/ 40%-70%) of the households sold fish for income. More than two-third (68%/ 65%-73%) of the households used their harvested fish for preparing the dry fish as value added product and storing for future use.

Figure 9: Proportion of BHHs spent money earned by selling the harvested fish



Most of the households used the income by selling their fish for purchasing other food items (96%), clothes (87%), and medicines (82%) and for children's education (76%). The other uses were repaying the loan (44%), savings (42%), housing (38%), home appliance (36%), purchasing furniture (33%), social activities (31%) and some productive activities like vegetable production (22%), fruit production (7%), fish culture (2%) and other income generating activities (16%).

3.3.5 Major challenges in subsistence fishing

More than one fourth (26.7%) of the respondents have mentioned that restriction from the representatives of lease holders or land owners as one of the major challenges. The other challenges were less fish available compare to earlier, theft of gears, natural hazard like storm, heavy raining, excessive cold, Sometimes they can't work due to sickness, and uncomfortable weather like storm, heavy raining, fogs, and very cold. More than a quarter (26.7%) of the BHHs didn't mention any problems.

It is one of the common scenarios of floodplains and haor basis of entire Sylhet region that many people capture millions of spawn of many local fish species during rainy season; and these are mainly used for consumption or selling to the other for the same. Therefore some co-management focused initiatives for introducing a short ban period of fishing can be effective for enhancing the sustainable growth inland fisheries in Sylhet region.

3.4 Vegetable gardening

Vegetable gardening is a traditional agricultural activity in rural Bangladesh and vegetables have a very important role in human diets as a source of valuable micronutrients. Considering its importance, vegetable production has been one of the common interventions recommended for all beneficiary households in Suchana. About 98% households had active vegetable gardens during the data collection; and entire beneficiary households had one within last one year. The usual locations for these gardens were at homestead land (74%), nearby crop field (54%), roadsides (16%) and pond dikes (13%).

Table 4: Average area of vegetable garden per BHHs in decimal

Location of Veg garden	% of BHHs had Veg Garden n=90	Size of Veg Garden in decimal n=90
Pond dike	13%	0.3
Road side	16%	0.2
Homestead	74%	0.8
Crop field	54%	3.1
Total	**100%**	**4.4**

Table 4 shows the average area (decimal) of vegetable gardens using different categories of land. Average sizes of vegetable gardens were 4.4 decimals per beneficiary households.

3.4.1 Production and use of vegetables

Entire households harvested vegetables in last one year. Average vegetable harvest was 144 kg per BHH (Figure 10).

Figure 10: Harvest and uses of vegetables in last one year

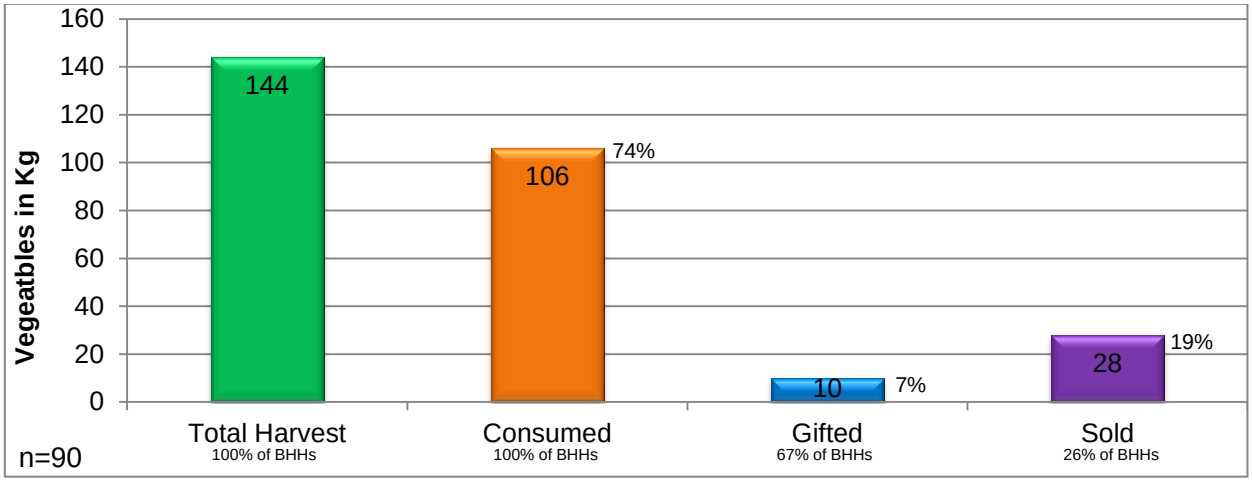


Figure 10 shows that almost three-quarter (74%) of harvested vegetables was used for family consumption averaging 106 kg. Some of the vegetables like 10 kg (7% of total harvest) were gifted to their relatives and neighbors, and 19% of the harvest (50 kg) was sold. The average income was 713 BDT per household in last 1 year.

Figure 11: Proportion of BHHs spent money by selling vegetables from their gardens

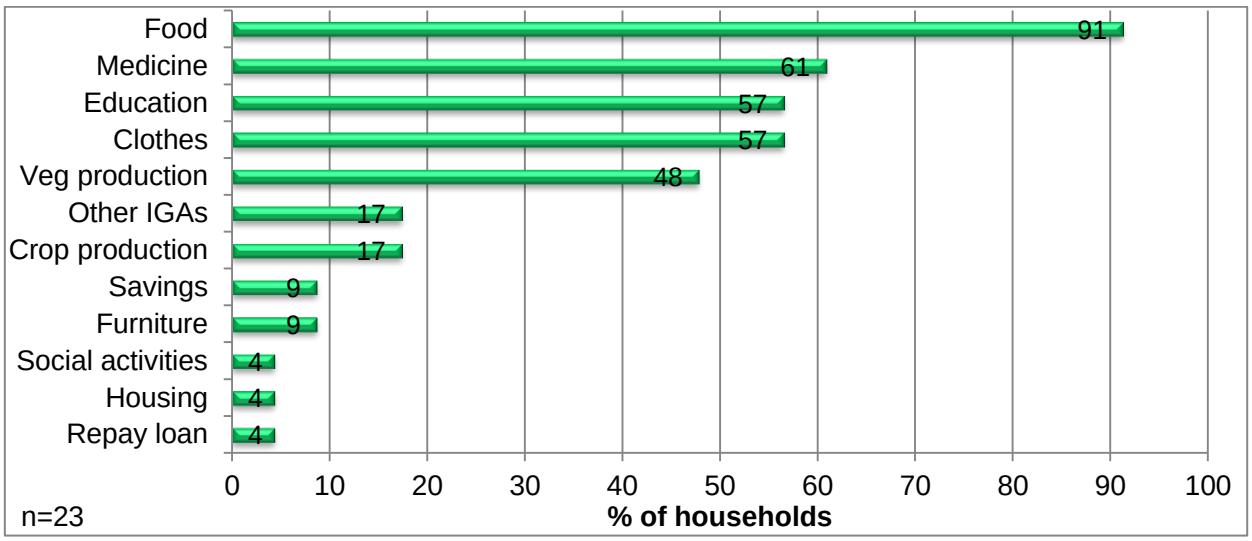


Figure 11 shows that the highest proportion (74%) of the households used the money earned by selling harvested vegetables were used for purchasing other food items, and second layer of uses were for purchasing medicines (61%), on education for the children (57%) and clothes (57%) for the family members. Then considerable proportions of BHHs used for productive activities and income generating activities (IGAs) especially veg production (48%), crop production (17%) and other IGAs (17%). Other uses were for savings (9%), repaying loan (4%), purchasing furniture (4%), social activities (4%) and housing (4%).

3.4.2 Challenges faced by the BHHs related to vegetable production

Figure 12: Challenges faced by HFP-pond HHs during intervention in last 1 year

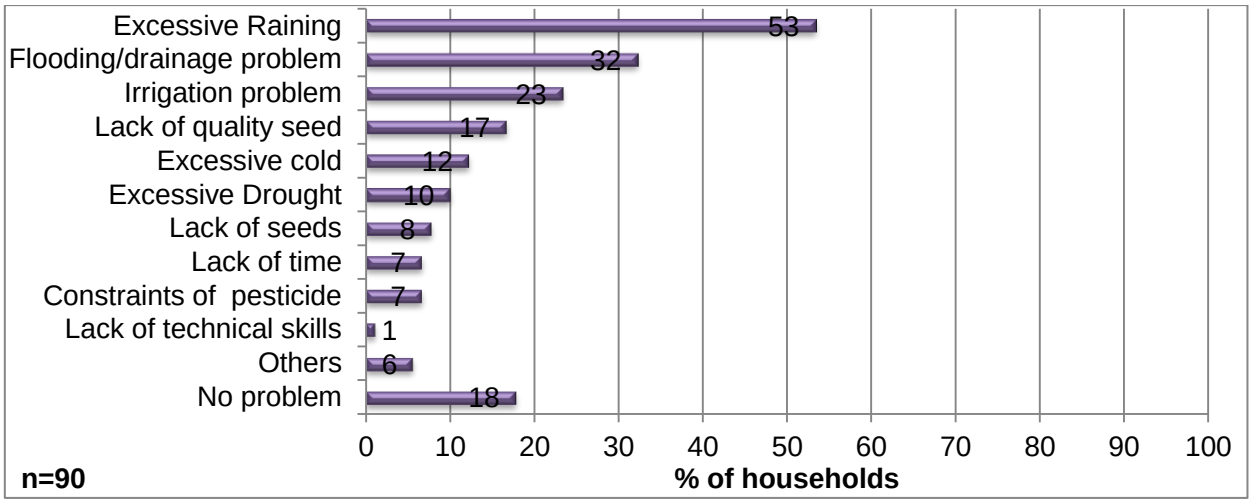


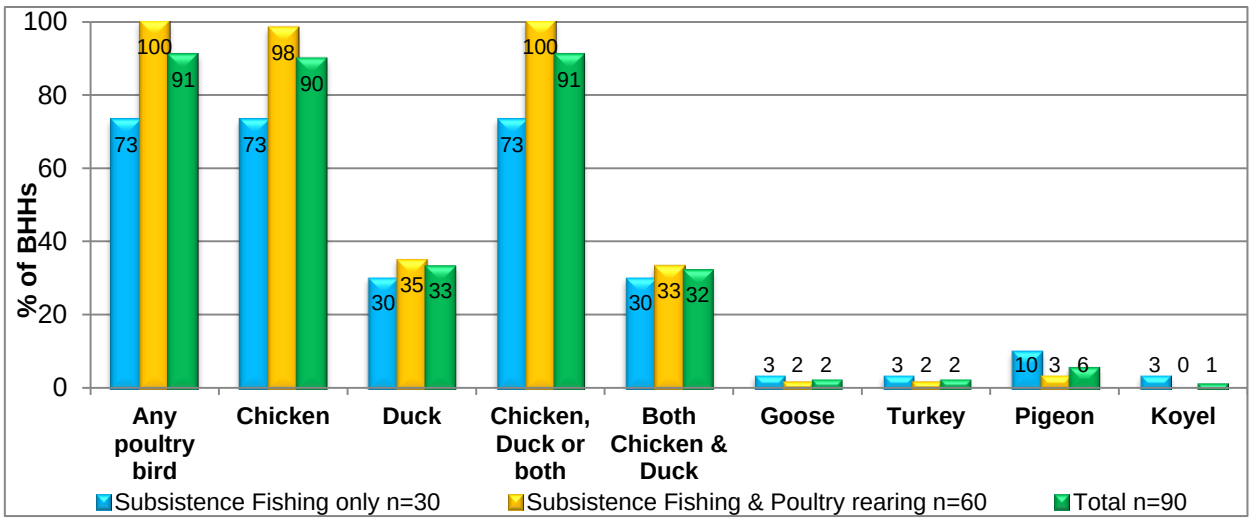
Figure 12 shows the major challenges faced by the beneficiary households. Overall more than eighty (82%) of the respondent households faced different types of challenges. The major challenges were excessive raining (53%), flood and drainage problems (32%), irrigation problem (23%), and lack of quality seeds (17%). Some other challenges were excessive cold (12%), excessive drought (10%), fewer amounts of seeds (8%), lack of time (7%), constraints of pesticides/ pest control (7%), lack of technical skills (1%), and some others (6%). About 18% of the respondent didn't mention any challenge.

3.5 Homestead poultry rearing

Homestead poultry rearing is also one of the very traditional practices for rural Bangladesh including Sylhet and Moulvibazar districts. In recent decades, commercial poultry has grown dramatically though intensive rearing practices. Still, local poultry has huge demand in the market and price is also 40% to 60% higher compared to the broiler chicken. But they face a number of constraints and limitations during rearing the local chickens especially attacking of diseases, higher mortality due to poor rearing practices and diseases, loss by the predators, and less production in terms of size and number of eggs, and meat per bird compared to the commercial ones. Besides the number of constraints and limitations, there are many advantages in rearing of local chickens, such as immune capacity is stronger than hybrid or improved chicken, scavenging and semi-scavenging rearing is possible, easy adoptable in rural environment, new chickens can be hatched at the household levels, feeding and rearing costs are comparatively lower, market demand is higher, easy to sell, and sustainable rearing practices.

Nurful and her family member in front of their house

Figure 13: Proportion of BHHs had poultry rearing in last 1 year

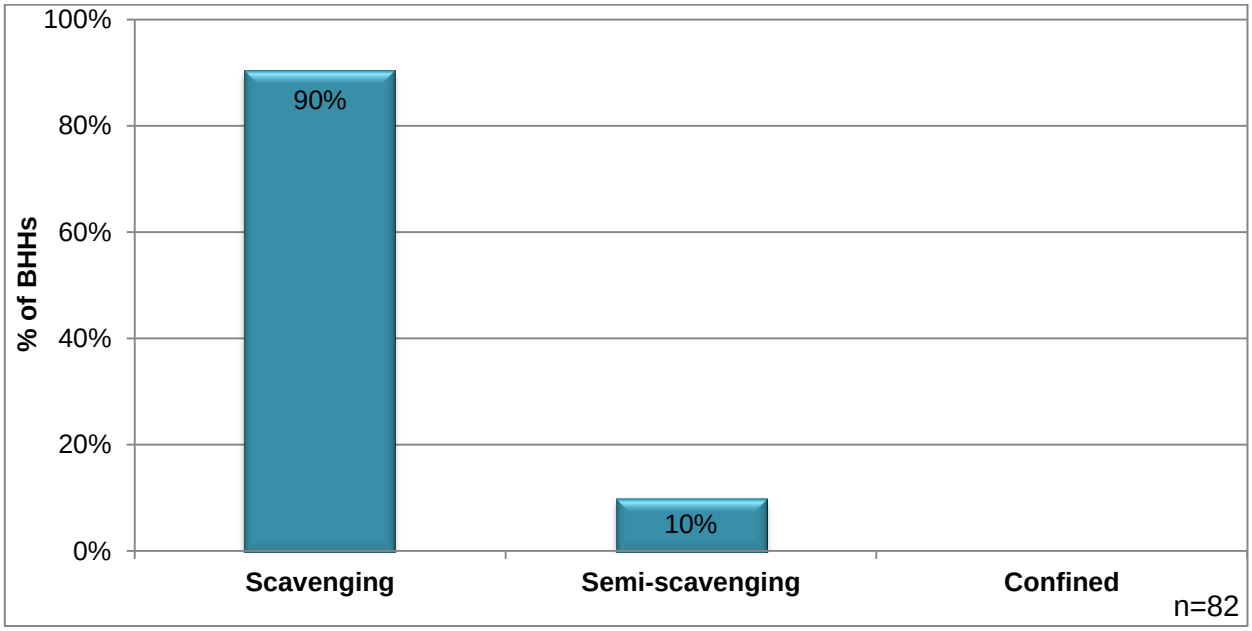


Based on figure 13 more than ninety (91%) percent of the subsistence fishing beneficiary households had poultry rearing either chicken (90%) or duck (33%), or both chicken and duck (32%). Entire (100%) beneficiary households had poultry those have received supports on both the fishing and poultry rearing but the households those have received interventions only on subsistence fishing, 73% of them had also poultry rearing from their own initiatives. Besides the chicken and duck, few proportions of the households had also goose (2%), turkey (2%), pigeon (6%) and koyel (1%) from their own initiatives. But current report is mainly focused on the performance of chicken and duck rearing.

3.5.1 Poultry rearing practices

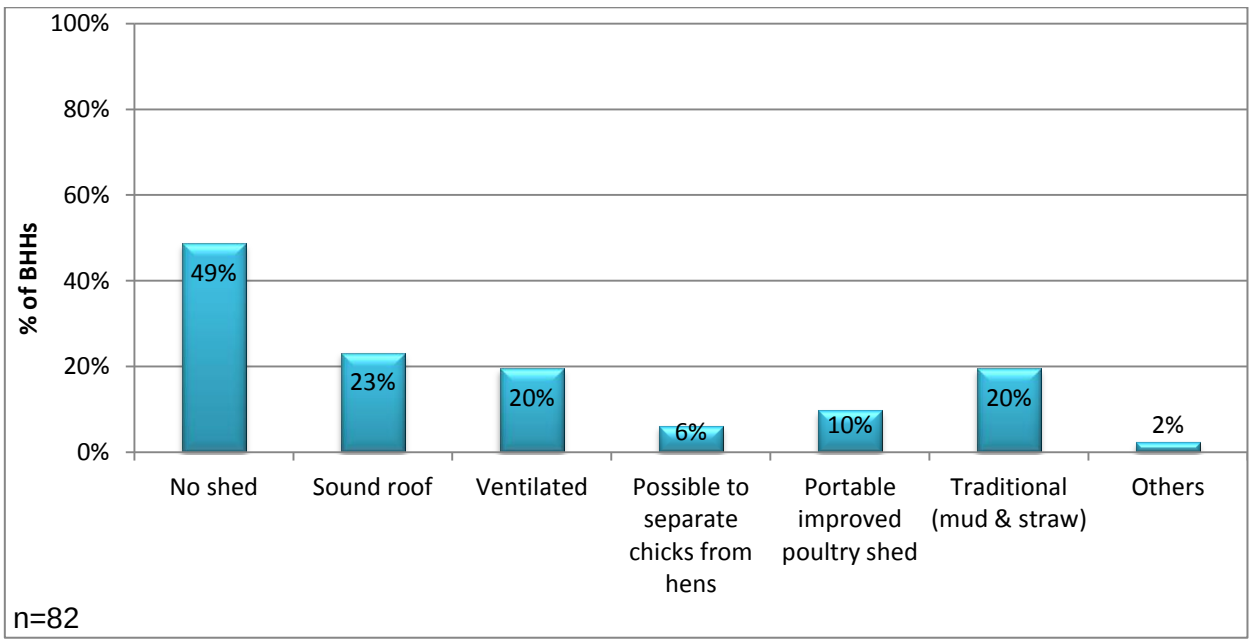
Figure 14 shows that 90% of the beneficiary households followed scavenging rearing practices and 10% BHHs followed semi-scavenging practices. None of the BHHs of followed confined rearing practice.

Figure 14: Proportion of BHHs followed different types of rearing practices in last 1 year



3.5.2 Status of poultry shed at the beneficiary households

Figure 15: Proportion of poultry shed were used at the BHHs



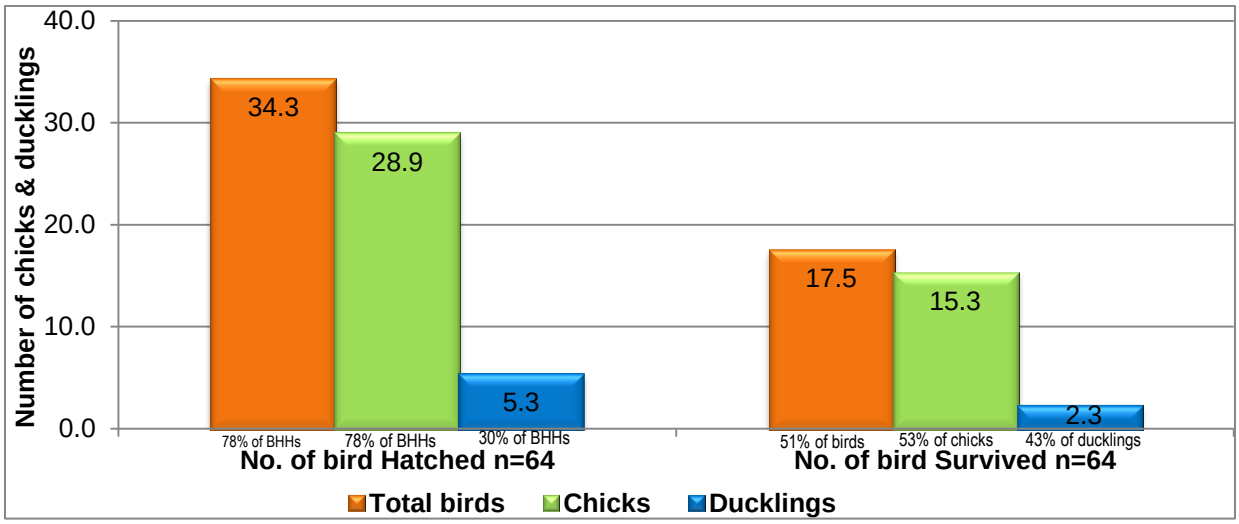
About a half (49%) of the households didn't have any separate poultry shed and one fifth (20%) of the households had traditional poultry shed made by mud and straw or similar other materials. Only 6% of BHHs had poultry shed where chicks may possible to separate from the

hens where as 20% BHHs had poultry shed with sound roof and 20% BHHs had poultry shed with well-ventilation facilities. Only 10% BHHs had portable improved poultry shed, and 2% of BHHs had other facilities for keeping their poultry.

3.5.3 Hatching practices

Hatching is also very important for rearing the local poultry and ducks for both the long term sustainability and profitability.

Figure 16: Number of poultry birds was hatched per the BHHs in last 1 year

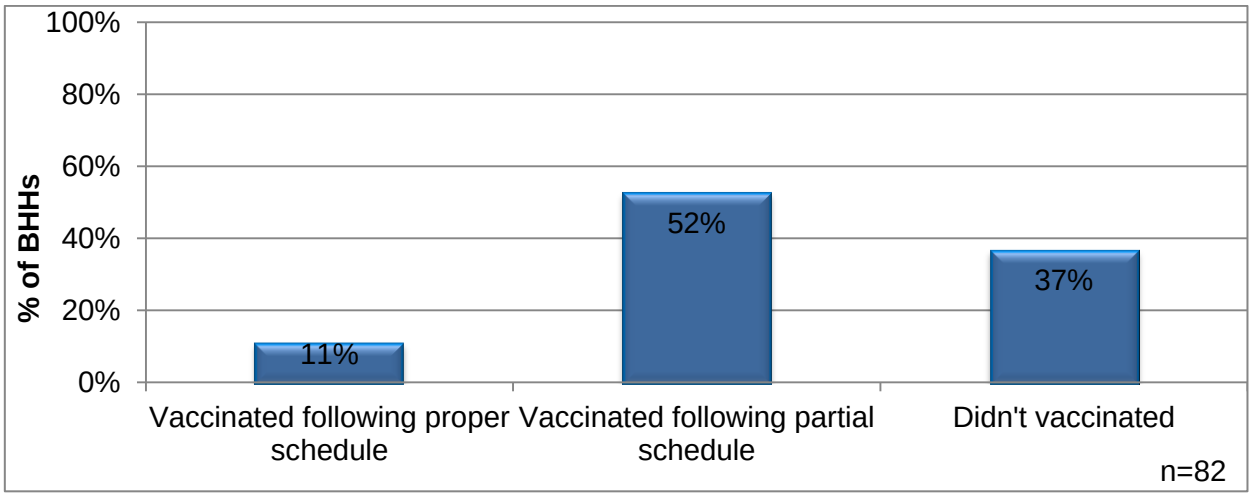


Overall 78% of the respondent households hatched poultry bird using their local broody hens in last 1 year. Out of those, 78% households produced chicks and 33% households produced ducklings. On an average total 34.3 numbers of birds were hatched per households; of which 28.9 were chicks and only 5.3 were ducklings. But overall survival rate of the birds was 51%, and that was 53% for chicks and 43% for ducklings (Figure 16).

3.5.4 Status of vaccination

Routine Vaccination plays an important part in the health management of the poultry birds. It helps to prevent a particular disease by triggering or boosting the bird's immune system to produce antibodies. So, outbreak of many diseases can be prevented through ensuring of the routine vaccination of poultry bird since day old chicks.

Figure 17: Status of vaccination of the poultry birds in last 1 year



Based on the findings, more than one third (63%) of BHHs used vaccination for their poultry and 37% of the BHHs didn't vaccinate their poultry birds in last 1 year. Only 11% households vaccinated following the recommended schedule and 52% households vaccinated their poultry bird following partial schedule.

Figure 18: Proportion of BHHs used poultry vaccination through local service providers

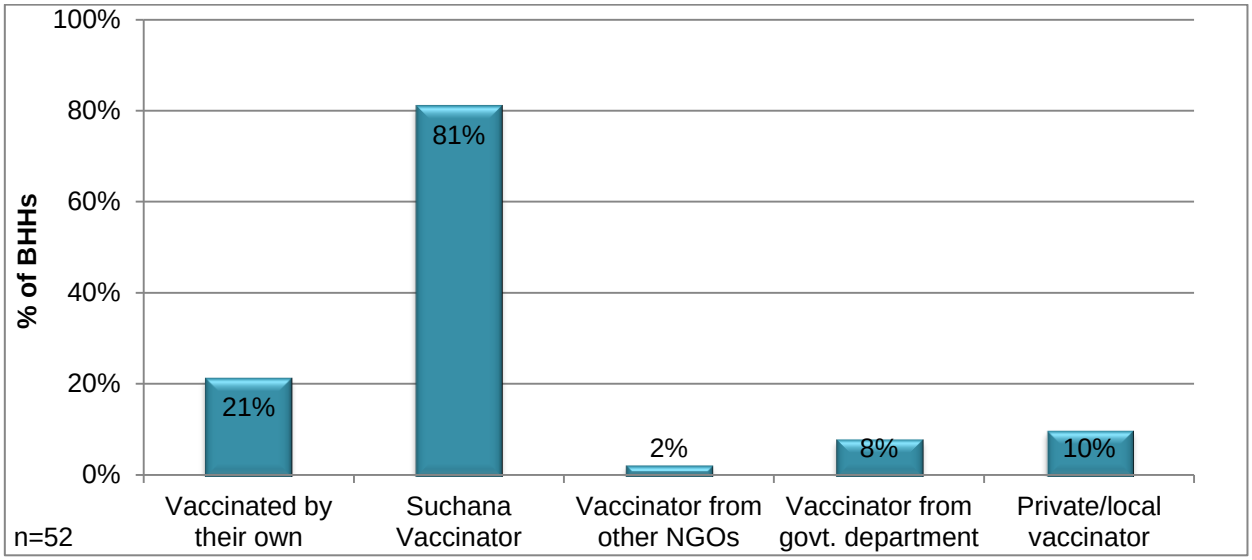
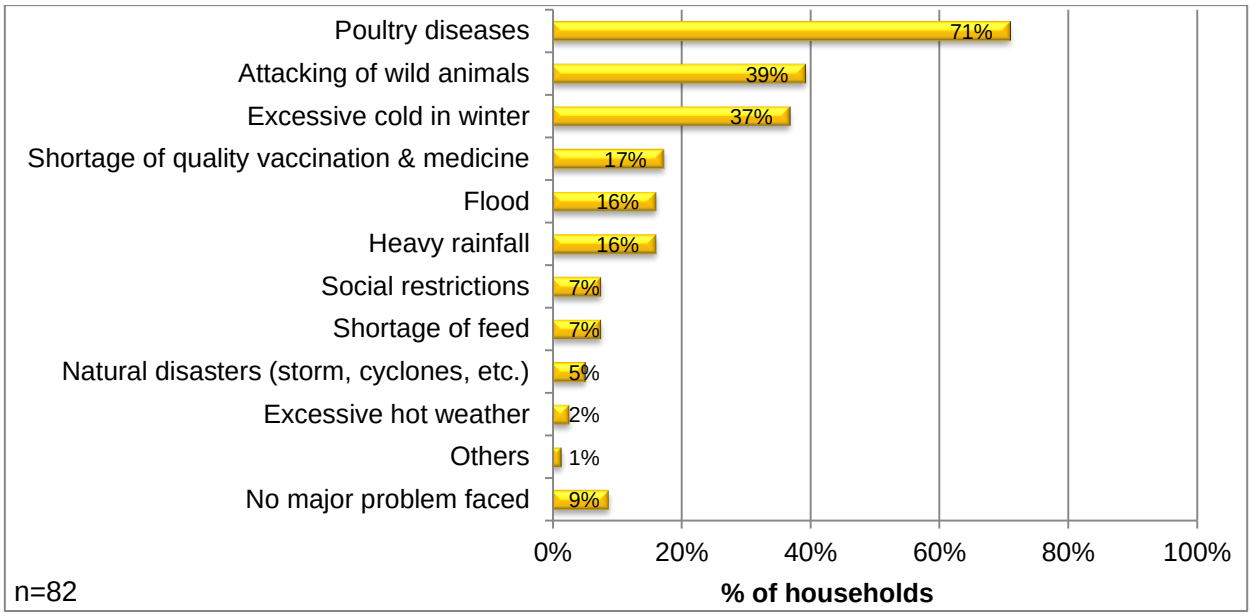


Figure 18 shows that 81% of the BHHs vaccinated their poultry using mainly Suchana vaccinators, 21% of the BHHs vaccinated by their own and some BHHs used the vaccinators from other NGOs (2%), government department (8%) and other private vaccinators (10%).

3.5.5 Challenges were faced by the BHHs on poultry rearing in last 1 year

Figure 19: Proportion of households faced challenges regarding poultry rearing



Based on figure 19, highest proportion (71%) of the respondents mentioned 'attacking of poultry diseases' as one of the major problems for their poultry birds. Other challenges were attacking of wild animals (39%), excessive cold in winter (37%), shortage of quality vaccination and medicine (17%), flood (16%), heavy rainfall (16%), social restrictions (7%), shortage of poultry feed (7%), other natural disasters like storms, cyclones etc. (5%), excessive hot weather (2%)

and few others (1%). Only 9% of the respondents didn't face any major problem. Overall 59.8% (n=82) of the respondents (those had poultry) informed that they faced damages poultry birds within last 1 year. Major reasons of damages were death from the diseases (88%, n=49), death from the accident (4%), killed/ captured by predators (35%), theft (4%), excessive cold in winter (8%), and some unknown reasons (10%). (Annex, Figure 24) Most of these challenges can be reduced through regular vaccination following the recommended schedule and improving the poultry shed, use of supplementary feeding and other improved rearing practices including the biosecurity.

3.6 Level of satisfaction about the integrated support

Figure 20: Level of satisfaction after receiving the integrated supports from Suchana

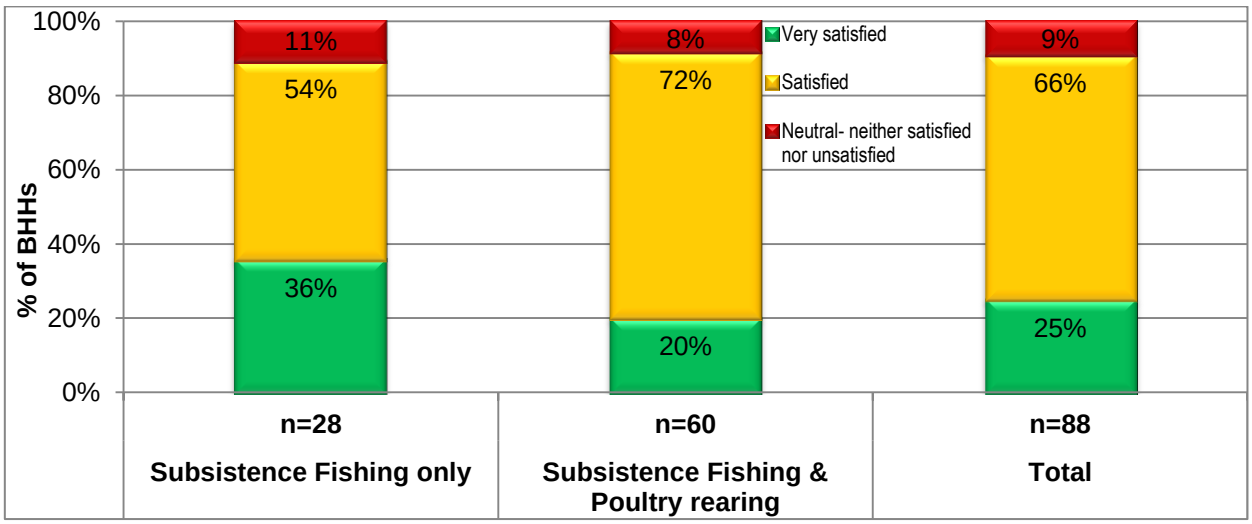


Figure 20 shows that overall 91% respondent households were either satisfied (66%) or very satisfied (25%) after receiving the supports on either only subsistence fishing or subsistence fishing or small-scale poultry rearing in addition to the vegetable production system. Still, it is important that 9% of the BHHs mentioned their neutral impression about the subsistence fishing oriented supports. They were neither satisfied nor unsatisfied. More proportion of BHHs were very satisfied those received subsistence fishing only (36%) compare to the BHHs those received supports on both the interventions including subsistence fishing and poultry rearing (20%) using same of amount of allocated money per beneficiary household.

4. Conclusion and recommendations

To address the malnutrition for the poor households by using the very small resources, there was very encouraging progress in harvesting and use of fish, poultry (chicken and duck), eggs and vegetables at the beneficiary households those received support either on subsistence fishing only or both subsistence fishing and small-scale poultry rearing. They harvested diversified species of fish, and collected good numbers of eggs and wider varieties of vegetables; and more importantly a good proportion of their harvests, they used for their family consumption. It has also strong reflections on dietary diversity of reproductive age women. Despite high level of satisfaction in receiving supports of subsistence fishing, small-scale poultry rearing and vegetable gardening; the BHHs also faced some challenges regarding their fishing and production practices. The major challenges related to fishing were restriction from the representatives of lease holders or land owners, less fish available compare to earlier, theft of gears, natural hazard like storm, heavy raining, and excessive cold for the fishing. Sometimes they can't work due to sickness, and uncomfortable weather like storm, heavy

raining, fogs, and very cold. The highest proportion (71%) of the respondents mentioned ‘attacking of poultry diseases’ as one of the major problems for their poultry birds. Other challenges were attacking of wild animals, excessive cold in winter, shortage of quality vaccination and medicine, flood, heavy rainfall, social restrictions, shortage of poultry feed, and other natural calamities.

Therefore, further attention should be required to improve their fishing and production practices of poultry. Some co-management oriented initiatives for introducing a short ban period of fishing especially protection of naturally grown fish fry and strengthening of linkages between lease holders and fishers can be effective to enhance the sustainable growth of inland fisheries and fishing. Improving the poultry shed and strengthening the coverage of vaccination for the poultry birds following the recommended vaccination schedules, use of supplementary feeding and other improved rearing practices can be more effective.

Barik Mia- husband of.Sultana, Fotepur village of Mogolgaon union is fishing with another co-fisher at Jilkar Haor, Sylhet

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6. Annexes

Figure 21: Proportion of reproductive age women consumed different food items in 24 hours of previous day

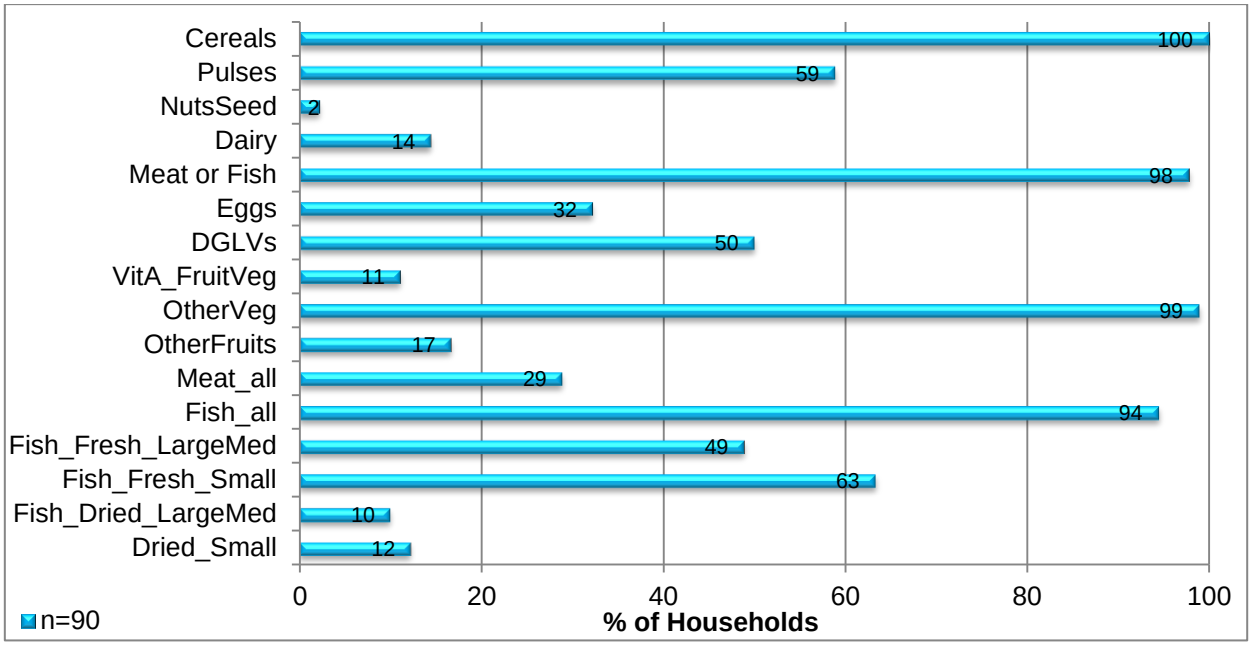

Figure 22: Proportion of BHHs had poultry rearing in last 1 year

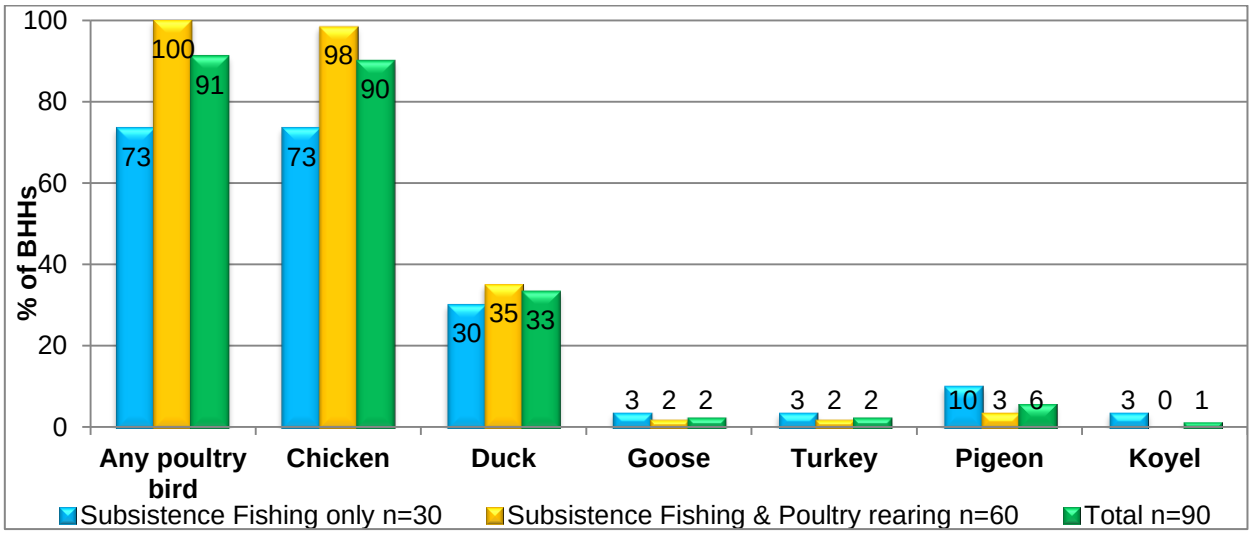

Table 5: Harvest/ production and usage of fish and poultry products in last 1 year

Items	Total harvest/ production	Consumed	Gifted	Sold	Used for dry fish	Hatched	Damaged/ died	Have currently/ bio-mass
	n=90	n=90	n=90	n=90	n=90	n=90	n=90	n=90
Fish (in Kg)	269	114 (42%)	10 (4%)	129 (48%)	16 (6%)			
Chicken & Duck (in number)	21	6 (27%)	0.2 (1%)	4 (19%)			4 (19%)	7 (33%)
Eggs (in number)	101	59 (59%)	0.1 (0%)	20 (20%)		19 (19%)	1 (1%)	2 (2%)

Proportions of uses of the produces are showing in the parenthesis

Figure 23: Proportion of BHHs produced different varieties of vegetables in last 1 year

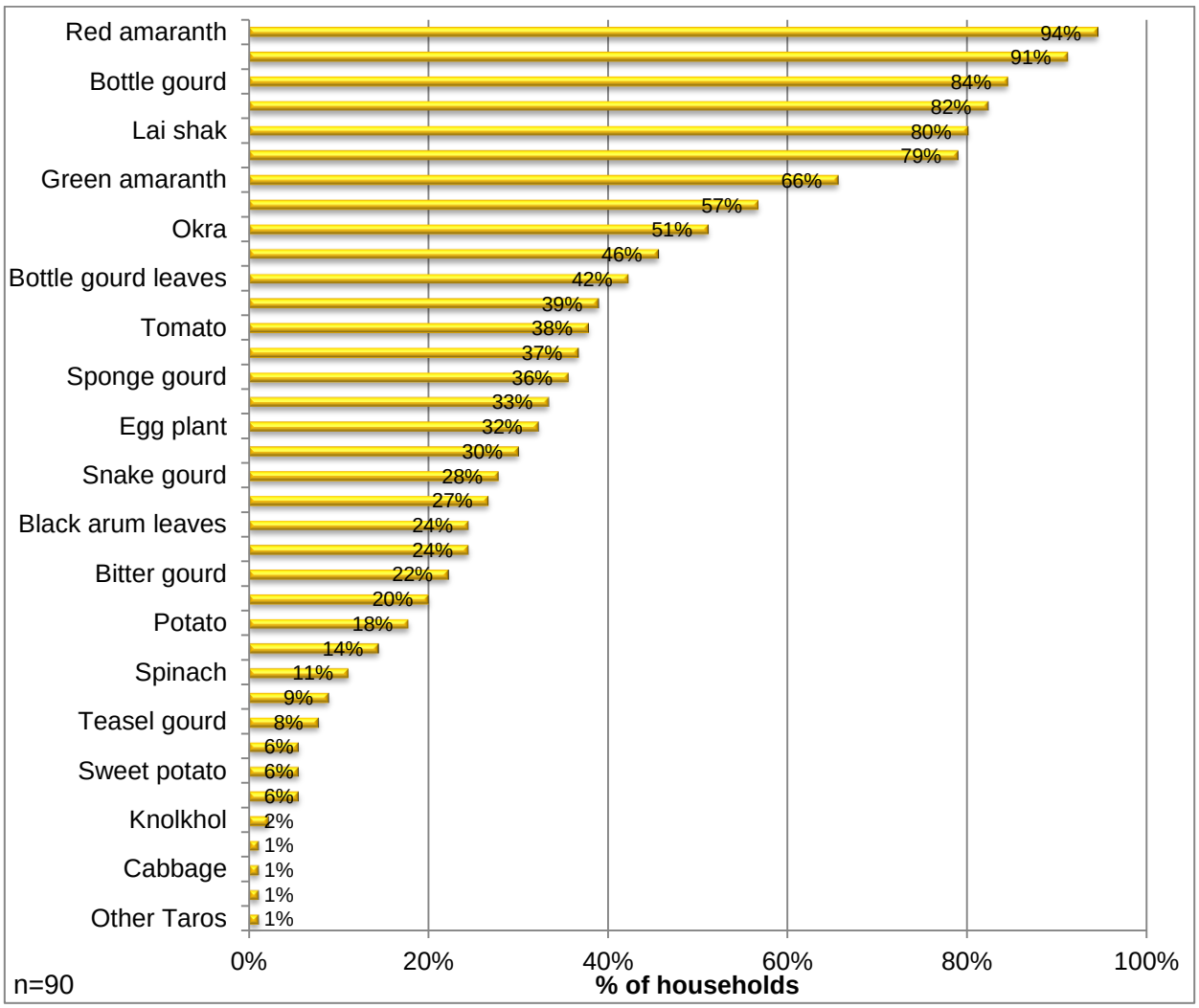

Figure 24: Major reasons behind the damages pf poultry birds in last 1 year