

Blue Gold Program



FFS curriculum on
Homestead garden, Nutrition, Poultry, Fisheries, Livestock and Field
Crops Modules

**Embassy of the Kingdom of the Netherlands,
Dhaka, Bangladesh**

**Bangladesh Water Development Board (BWDB)
Department of Agricultural Extension (DAE)**

Dhaka, Bangladesh



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List of Abbreviations

AEC	Agricultural Extension Component (Funded DANIDA)
BWDB	Bangladesh Water Development Board
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DAE	Department of Agricultural Extension
DLS	Department of Livestock Services
DOF	Department of Fisheries
EKN	Embassy of the Kingdom of the Netherlands
FFS	Farmer Field School
FO	FFS Organizer
RFLDC	Regional Fisheries and Livestock Development Component (DANIDA)
NGO	Non Government Organization
TOT	Training of Trainers
WMG	Water Management Group
DLO	District Livestock Officer

1.Introduction

Under Blue Gold programme, Component 3 is supporting to improve income and food security of WMG members through increased agricultural production. Farmers in all agricultural sectors (livestock, fisheries, crops) will receive support to adapt their farm management and make optimal use of the changing environment and be better prepared for changes in the future. As per design Blue Gold is following farmer Field School (FFS) is an extension approach to empower farmers and help them become more confident in making their own farm management decision.

Subgroups of WMGs will receive training using the FFS approach. DAE will be organized crops related FFS. Depending the budget provision 1000 crops FFS will be implemented by DAE, and 200+200 livestock and aquaculture FFS will be implemented by TA budget. It may be possible to organize on an average 2 different FFS within a WMG. These FFSs will have a different commodity focus, based on the Village Development Plan. But also Polder Development Plan and Value Chain Selection will help determine which types of FFS are needed.

Primarily six modules are included with 1st and 2nd cycle FFS within TA budget. The modules are on;

- i. Introductory sessions
- ii. Homestead garden (vegetables and fruits)
- iii. Poultry (chicken and duck)
- iv. Nutrition
- v. Fisheries
- vi. Livestock (Beef fattening, Dairy , Sheep & goat rearing)

Before initiating FFSs, Blue Gold organized two curriculum development workshops. One workshop was on homestead garden, nutrition and poultry modules and another was on livestock and fisheries modules.

DAE also finalized a curriculum on field crops, homestead garden and nutrition before starting their FFS. They also organized a day long workshop to review the previous curriculum developed by AEC.

Objectives of the workshops are;

1. To review the existing modules developed by RFLDC and AEC
2. To include demand based expert opinion
3. To include new topic on production technologies

Approach of the workshop

Day long workshop was organized for modules review. The participants experienced on FFS from different organizations (IFMC-DANIDA, BRAC, FAO-ECRRP, BARI, DLS, DAE, and SCDP) are attended. Nutrition consultant, blue Gold technical staffs, FFS master trainers, team leader and Deputy team leader are also attended the workshops.

At the onset of the workshops BlueGold experts presented the draft modules narrating sessions, contents and time frame in front of participants. Then all participants are divided into four groups. Each group reviewed different modules and made their suggestions. After groups discussion every group presented their output. Followed by each presentation, a large group discussion was taken place. After that discussion the curriculums were finalized.

2. Introductory session

This is a field guide to start the FFS session. The module focused on the information collection process regarding community people, agricultural resource mapping, FFS participants selection, baseline survey, FFS. There is some introductory work done before start. The main purpose of first sessions is to get in touch and familiarize with the WMG and to discuss with the community what type of FFS they would like to have. This is followed by participatory selecting of the participants for the FFS. Then there will be one or more sessions with the FFS group to discuss expectations and learning objectives of the FFS and if possible set targets for increased production.

Below the details on introductory session.

Table 1: Introductory sessions

No.	Timing and Duration	Activities	Notes
1	5 – 6 hours	<ul style="list-style-type: none"> Transect walk Situation analysis and preparation of resource map after transect walk 	<ul style="list-style-type: none"> The FOs have to familiarize themselves with the WMG where the FFS will take place. This process starts by getting introduced to the WMG executive members. The Zonal Socio-Economists and Community Organizers (CO) of Component 1 are expected to assist in introducing the FOs to the WMG executive committee. FOs will conduct a transect walk into the village for collecting information about the resources and the present practices of different farm components. They will be accompanied by 2-3 WMG members. Community resource map preparation based on resource list obtained from transect walk. In most cases there will already be a village map prepared by the concerned CO which is kept at the Blue Gold Zonal office. That map should be used as a starting point and can be updated if necessary. If no map is available, the FO will produce the map. The FOs will analyse the situation by making: <ul style="list-style-type: none"> Resource list Present practice of different farm component Market facilities Existing problem and support services etc.
2	2.5 – 3 hours	<ul style="list-style-type: none"> Community meeting Module wise primary farmers selection Discuss ways of horizontal learning 	<ul style="list-style-type: none"> The FO, CO and WMG members jointly invite the villagers to attend the community meeting. During the meeting discuss the possibility of having a FFS and explain which modules are available now and which perhaps will follow in future. Make a (long) list of farmers interested to attend FFS modules and keep that with FO for future use. Make sure that the entire WMG should know

No.	Timing and Duration	Activities	Notes
			that only 25 FFS participants for particular module will get trained but that they will also have the responsibilities to share their knowledge with the rest of the interested WMG members.
3	5 – 6 hours	<ul style="list-style-type: none"> Household verification visits for verifying the resources of primary listed farmers. Finalization of list of 25 selected farmers (module wise) Bench mark survey of selected 25 farm families (for poultry, homestead garden, and nutrition module) 	<ul style="list-style-type: none"> Informally the FOs will visit houses of the interested farmers (listed during community meeting) to be able to select the most suitable participants. It is probably necessary to spend more time (another day) to finalize this activity. Prepare a list of about 30 farmers. Show that list to the CO and executive members of the WMG, and finalise a list of 25 farmers. Use the supplied format for bench mark survey of 25 farmers. Benchmark includes information about present level of production.
4	2 – 2.5 hours	<ul style="list-style-type: none"> Ballot Box Test (BBT) Norms and expectations Agree day and time schedule of FFS Group formation Responsibilities for horizontal spreading of knowledge. 	<ul style="list-style-type: none"> This session is with the 25 selected participants. FO should prepare 20 sets of BBT questions in advance covering the 3 modules (homestead, poultry, and nutrition). This test will be conducted today at the beginning of the FFS and again at the end of the FFS. The facilitators will discuss with the participants about general norms of FFS like timely attendance, working in groups, maintaining learning environment etc. They will also discuss with the participants about their expectations (topics, production, inputs, etc). The facilitator should divide the 25 participants in to 4 sub-groups. S/he will make the subgroups through a group dynamic exercise e.g. using leaves of 4 different fruit tries. They should not be biased on group formation. Select a Group Leader from each subgroup. A Host Team Leader (HTL) will be selected for this day. At the end of each session, select a HTL for the following day and discuss with the participants about their role as HTL, which are recap of previous day's activities, act as introducer of the day's schedule and assist the facilitators. With the 25 FFS participants discuss and agree to take initiatives for horizontal learning so that other WMG members can also benefit from the FFS.
5	2 – 2.5 hours	<ul style="list-style-type: none"> Problem analysis Presentation of FFS curriculum and incorporate the needs of the participants. Date wise session plan preparation, which module when will start and finish 	<ul style="list-style-type: none"> A role play would be organized before this session. The facilitators along with some of the participants will perform a role play on bad seed. After the role play the facilitator will explain the roots of the problem in a participatory discussion. Then s/he will show them the process how a problem analysis can be done for a particular sector (e.g. rice

No.	Timing and Duration	Activities	Notes
		<ul style="list-style-type: none"> Production target setting 	<p>production). Then the facilitator will assign four subgroups with four topics i.e. Poultry, Vegetables, Fruits, and Nutrition. The four groups will break down the problems in to smaller facets and finally rank them by scoring with seeds. Then each group would present their group work, become familiar with the common problems and their causes. After presentation of problems, relate the problems with the topics of curriculum.</p> <ul style="list-style-type: none"> The FO should prepare session schedule before coming to this session. They can present the schedule during the session and can have modification if really needed and requested by the farmers. Sessions should be planned based on season and farmers' interest. The FOs will discuss with the participants about their present production status of different farm components and also ask them to set targets for production increase i.e. the participants should see that as a goal of the FFS, they will produce more (vegetables, chicken, egg, etc.) in a sustainable manner.

Brief on curriculums :

Homestead garden, poultry, nutrition, fisheries and livestock curriculums are a guide line for FFS facilitator to conduct the sessions in a systematic manner. The curriculums are developed considering the project objectives. The curriculums focused on the time line, topics/activities and the session conduction process. There is a guideline for trial setup, horizontal learning and value chain.

Objectives:

- Identify farmers' practices on crop-livestock-aquaculture-homestead garden production and management
- Identify problems and constraints that farmers face in crop-livestock-aquaculture-homestead garden production
- Identify farmers' knowledge on and perception of social issues and health, nutrition and hygiene practices
- Set-up target plan and practice of systematic production technologies on on crop-livestock-aquaculture-homestead garden production and management

Expected output

- FFS facilitator will be able to conduct the session properly
- FFS members will be able to practice improved management on crop-livestock-aquaculture-homestead garden production
- FFS members will become aware of health, nutrition and hygiene practices
- FFS members will be able to change their production practices

Details on the modules are shown below;

2. Curriculum on Homestead Garden Module

Table 1: Homestead garden (vegetables and fruits)

No.	Duration	Activities	Notes
1	2.5 – 3 hours (0 day)	<p>Vegetable production planning</p> <ul style="list-style-type: none"> • Introduction to homestead garden module • Importance of vegetables • Homestead space planning • Preparation of vegetable production calendar • Vegetable seeds and saplings selection – variety, characteristic, germination test, seed treatment etc. • Group dynamics exercise (“List as many as you can”) • Trial Planning (plan for vegetable, spices, fruit trees cultivation, utilizing different places of homestead area) • Discussion part related to value chain • Summary of day’s activity and declaration of next day’s programme 	<ul style="list-style-type: none"> • Prior to the session, the facilitator will summarize bench mark survey forms for homestead garden and share with the participants about their production, consumption, marketing and potentialities. Give them an impression that they can improve their homestead and produce more than the present situation. Try to set goals for production increase. • FOs will discuss with the participants about their major problems of vegetable cultivation. Then FO will ask them how these problems could be solved. After the discussion, FO will plan some trials to be implemented by the FFS participants for experiential learning. Then one trial setting can be initiated on that day. • Discuss with farmers about availability of improved vegetable seeds, fertilizers, fencing tools and other production related inputs. Discuss if collective action (e.g. at WMG level) can solve input related problems.
2	3 hours (7 days after starting)	<p>Vegetable production technology</p> <ul style="list-style-type: none"> • Recap • Vegetable production technology (practical) • Land preparation • Preparation of seedbed, sowing seed, transplanting of seedling • Organic and chemical fertilizer management and water management • Crop management • Pest management in homestead vegetable garden using IPM concepts • Group dynamics (“Message relay”) • Trial set up (Fertilizer management Organic, organic+ inorganic and only inorganic treatment) • Discussion part related to value chain • Summary of day’s activity and declaration of next day’s programme. 	<ul style="list-style-type: none"> • Through participatory discussion, FO should provide training to the participants on vegetable seed bed/pit preparation, use of organic and inorganic fertilizer, land preparation, seed sowing/transplantation, mulching, water mgt. fencing and IPM methods of pest management. • Take the participants to the nearby field and show them ways of seed bed/pit preparation, soil treatment (through burning debris, using polythene sheet), seed sowing/seedling transplanting etc. by practically doing those things. Show them different fertilizer samples and teach them how these should be applied for vegetable production. • The FOs should have follow up of these activities. After providing training they should visit participants’ house the other days and observe whether the farmers are in right tract or not. • The FOs should visit different farmers’ house earlier and select suitable person/house for trial setup. • The FO will discuss about price and availability of vegetable production related inputs (such as good quality seeds) in that locality and note down the points in FFS

			<p>register.</p> <ul style="list-style-type: none"> • Make sure to agree how to take care of the trial plots until next meeting and who is responsible.
3	3 hours (22 day after starting)	<p>Vegetable pest management</p> <ul style="list-style-type: none"> • Recap • Collection, sorting, identification of pest and diseases sample of vegetables • Trial set up (pest management in vegetables – setup one trial from different options to different homesteads) • Fruit fly management in cucurbits (Bagging/poison bait/Sex pheromone)/ Leaf sucker (Hand picking, use of Neem extract, use of ash, use of soap water, use of tobacco dust, use of bio-agent) • Management of BSFB by clean cultivation, using bio-agent, using sex pheromone (discussion). • Adverse effect of pesticides (role play) • Practice AESA on vegetables • Discussion part related to value chain • Summary of day's activity and declaration of next day's programme. 	<ul style="list-style-type: none"> • FO will instruct the participants in the previous week to collect available insect, disease samples from their garden. FO will also collect some samples before coming to the session. FO will go to the field with the 4 subgroups to collect some more samples. Sort them in 3 groups (pest, beneficial and neutral), identify the pests and discuss with them about their common management options. • The FO should find suitable plots to set trials on pest management. They will try to establish as many trials as they can set considering availability of field and crop. Be careful in monitoring the trials. Share all information with the participants during trial visit. • Discuss with farmers about availability of, botanical pesticides, pheromone bait and other bio-agents for pest management. • Discourage use of chemical pesticides in homestead garden because of high risk for children and farm animals. • Discuss the present status of service providers related to pest management and availability of inputs. Discuss possibility of collective action via WMG to get access to inputs such as Neem, pheromone traps, etc..
4	3 hours (50 day after starting)	<p>Plantation of fruit tree</p> <ul style="list-style-type: none"> • Recap • Introduction, opportunities, Benefits and scope of fruit cultivation in that locality • Group dynamics ("Doing things for or with peoples" (across the river) • Sapling selection and planting • Trial set up (New fruit/ new variety of a fruit cultivation) • Trial observation (vegetables) • Review if decisions from AESA on vegetables were implemented • Discussion part related to value chain • Summary of day's activity and declaration of next day's programme 	<ul style="list-style-type: none"> • FO will discuss with the participants about their present production, consumption and sell of fruits by analysing the bench mark survey and highlight their potentialities. • Use an ideal sapling during discussion about sapling selection and demonstrate the method of sampling transplantation. • New fruit/ new variety of existing fruit sapling transplantation should set up by this time. • Observe the vegetable trials with the participants and encourage discussion about the performance. • Discuss with farmers about availability of quality saplings, nursery and service providers related to fruit cultivation, marketing, processing etc. • Make sure to agree how to take care of the trials/plants until next meeting and agree who is responsible.
5	3 hours (65 day after starting)	<p>Fruit tree management</p> <ul style="list-style-type: none"> • Recap. • Problem identification of fruit trees and their management • Pruning & training of fruit trees • Existing fruit tree improvement – budding & grafting 	<ul style="list-style-type: none"> • FO will instruct the participants during the previous week to collect different samples related to fruit problems. FO will also collect some samples before coming to the session. • Through participatory way FO will discuss about different major problems of fruit trees by showing the samples. During visit to the

		<ul style="list-style-type: none"> Removal of parasitic plant, Fertilizer management , Pest management, Water management Trail set up on Fruit Tree Management (Pruning & training of fruit trees; removal of parasitic plant, fertilizer management; pest management and water management) Group dynamics ("Water Brigade") Trial set up – Set one (or more) trial from 4 option from Mango hopper or weevil control / Bagging of fruit for controlling fruit fly / Powdery Mildew or anthracnose diseases Discussion part related to value chain Summary of day's activity and declaration of next day's programme 	<p>homestead the facilitator can show the problems to the participants. Facilitator will encourage participatory discussion on management of the common problems.</p> <ul style="list-style-type: none"> Set the trials at suitable places and observe those regularly. Distribute the trials among the FFS participants. Discuss with the farmers about problems related to different inputs like fertilizer, pesticides, and other management inputs and note those down.
6	3 hours (80 day after starting)	<p>Preparation of organic manure</p> <ul style="list-style-type: none"> Recap Importance of organic manure FYM pit preparation (discussion and set-up of FYM demonstration) Use of organic manure Group dynamics ("The boat is sinking"-Titanic) Discuss on AESA and Practice AESA on fruit tree Trial observation (vegetables and fruits) Discussion part related to value chain Summary of day's activity and declaration of next day's programme 	<ul style="list-style-type: none"> The FO will collect different samples of house hold wastes and start discussing with the participants how they manage and utilize these things. S/he will keep ready a farmer who will prepare a FYM pit during the discussion. All participants will also take part in the preparation of the FYM pit. During pit preparation, the facilitator will discuss all important issues about organic manure through participatory way. Facilitator will ask the participants about marketing facilities of organic manures, prospect of quick compost, vermi-compost etc. Encourage all farmers to start making FYM at their own homestead.
7	3 hours (95 day after starting)	<p>Harvesting of vegetables and fruits</p> <ul style="list-style-type: none"> Recap Review if decisions from AESA on fruit trees were implemented Vegetable seed production and storage – discussion and practical Seed production techniques (land selection, seed collection, seed treatment, seed sowing/seedling transplantation, follow modern cultivation method, isolation, roughing etc.) Group dynamics ("7 up game") Vegetable seed harvesting, threshing, winnowing and storing Fruits and vegetables harvesting, processing and marketing Trial plot observation Discussion part related to value chain 	<ul style="list-style-type: none"> The FO will discuss the topics in a participatory way. S/he will demonstrate proper methods of fruit and vegetable harvesting, processing and marketing. They will also show the methods of seed preservation techniques by using different natural repellents like dried neem leaves. They will demonstrate the pots, bottles and bags which can be used for seed preservation. Discuss with the participants about marketing of the fruits and vegetables. Try to know about price, market actors and constrains of marketing.

		<ul style="list-style-type: none"> • Summary of day's activity and declaration of next day's programme 	
8	3 hours (110 day after starting)	<p>Results and conclusions</p> <ul style="list-style-type: none"> • Recap • Adverse effect of chemicals used for fruit ripening, fish & vegetable processing. • Trial plot observation and discuss results and make conclusions on fruits and vegetable study plots and economic benefit. • Group dynamics ("Finding lost items") • Discuss results and conclusions on fruits and vegetable production, analyze home consumption and marketing, economic benefit. • Conduct follow up survey on homestead garden. 	<ul style="list-style-type: none"> • The FO will collect different sample packets of chemical ripeners. They will also collect different commodities like fruits, vegetables, fried rice etc. which have been treated with chemicals. Discuss with the participants about the adverse effect of those chemicals on human health and nature. • Visit the existing trials finally and discuss about leaning from the trials. • Discuss with the farmers about their achievements of target which they set at the beginning of FFS sessions • If there is time constrain, conduct follow up survey during off time. • BBT would be conducted at the end of the 4 modules.

4. Curriculum on Poultry Module

Table 1: Poultry (chicken and ducks)

No.	Duration	Activities	Notes
1	2-2.5 hours (0 day)	First poultry session <ul style="list-style-type: none"> Introduction to the different topics of this module Production planning for poultry (Duck & Deshi Chicken) Planning of poultry learning sessions and trials Discuss bench mark data 	<ul style="list-style-type: none"> Discussion on importance of poultry sessions Collect local breed if available Facilitate a detailed discussion on poultry trial module. Practical production planning for chicken
2	1.5- hours (14 days after start)	Housing Management of Poultry <ul style="list-style-type: none"> Recap Importance of poultry housing Showing day and night shelter system for adult chicken Show how to set housing at the household level Introduce housing materials Measurement of ideal house for local poultry Group Dynamics-(Making Pyramid) Trial set up on improve and traditional rearing system of poultry; break down in to housing, early chicks separation, vaccination and de-worming etc Showing different types of local housing (two storied or baskets) Discuss inputs supply. Summary of day's activity and declaration of next day's programme 	<ul style="list-style-type: none"> Practical on keeping chicken in house or basket Discussion on why chicken and ducks house are separated? Discussion on importance of day and night shelter Discussion on different management of housing system Before setting a trial FO should select one beneficiary who will have at least 4-5 broody hen, build a two storied house, Hazal etc, for improve rearing system Collect information of broody hen which is going to incubate very soon for both case and control study. It can be replicate 1:2 or 2: 4 like this. Poultry housing placed in a convenient space in south facing. Make starting documentation as per register format. Discussion on availability of materials for housing preparation.
3	2 hours (28 days after start)	Observation of poultry housing system <ul style="list-style-type: none"> Recap Observation of feeding system Observation Hazal and incubation system Collect different data on poultry trials Group Dynamics-(Ball Toss Game) FMA 1 Practices 	<ul style="list-style-type: none"> During FMA discussion why feeding and watering during incubation is important? FO will ensure participation of all members. FO will in advance select four houses near to session place. Participants are divided into four groups and FO will send them to selected house. After observation of farmers house they will present what are their findings and then give suggestions to the respective farmers. All documented papers are kept in farmers' house so that they can use it when necessary.

		<ul style="list-style-type: none"> Summary of day's activity and declaration of next day's programme 	
4	2-2.5 hours (50 days after start)	<p>Laying and Broody Hen Management</p> <ul style="list-style-type: none"> Recap Identify broody hen for hatching eggs Why broody hen requires feed and water during incubation Select and preserve eggs for hatching How to handle and manage a broody hen Identify fertile and in-fertile eggs after seven days Group Dynamics-(People Knots Game) Health tips for broody hen management Setting of eggs for incubation Placement of Hazel Summary of day's activity and declaration of next day's programme 	<ul style="list-style-type: none"> Collect one or two broody hen for showing characteristics of good quality hen. Facilitator has prepared a Hazel as an example before taking this session Collect broody hen which was incubated not more than 7 days (5 days is better). All training materials should be prepared in advance. Collect fertile and in fertile eggs Practical on Hazel preparation. Divide the participants into four groups and ensure one Hazel for each group. Remember that Hazel cannot be made in one day. It requires time. So, follow up support is necessary to complete each Hazel. Set up trials on improved Hazel at selected farmer house or places and observe those regularly Before setting trial FO will ensure housing, feeding and incubating materials etc, Candling can be done in dark place.
5	2 hours (75 days after start)	<p>Chicks and duckling rearing management</p> <ul style="list-style-type: none"> Recap Importance of creep feeding system Prepare poultry saline for chicks Have practiced the use of a basket, gunny bags, straw Have practiced including feeding, watering and cleaning the area beneath the basket/Polo Chick separation Group Dynamics (Defend the Egg) Brooding of chicks and duckling Time of duckling releasing in water Have practiced vaccination. FMA -2 (Trial observation and information collection) Summary of day's activity and declaration of next day's programme 	<ul style="list-style-type: none"> FO will collect hen with chicks, or ducklings, Vaccines from DLS office or any private sectors or pharmacy, Polo or basket from farmers or market for showing creep feeding system. Practical: Showing the Creep feeding system Poultry saline like human saline but here include extra antibiotic for dry up yolk sac Chicks separate and reduce broodiness of hen. Observation data preserved for future analysis. FO will collect feeder, drinker, materials for saline materials Discussion on input supply chain for feed, vaccines, vitamins and medicines FMA-2, will practice on trial (Case-2, Control Group- 2 or 3) (Improve trial is 2 and traditional 2 to 3) Case one supported by project and case 2 supported by farmers herself but FO will encourage farmer to do it. Discuss about availability of inputs needed for chicks management, such as special quality feed, feeder, drinker, etc. Four group can practice FMA-2
6	2 hours (90 days after start)	<p>Poultry Health Care</p> <ul style="list-style-type: none"> Recap Identify healthy and unhealthy chicken/duck Symptoms of common diseases 	<ul style="list-style-type: none"> Collect picture of healthy and unhealthy birds or project can develop this materials Showing different types of poultry vaccines and practices dilution and application procedures

		<p>of poultry</p> <ul style="list-style-type: none"> • Internal and external parasites, public health important disease • Preventive measures for poultry diseases • Group Dynamics-(The Quiet Game) • Routine schedule of vaccination of poultry • Summary of day's activity and declaration of next day's programme 	<ul style="list-style-type: none"> • Collect picture of poultry diseases from pharmaceutical company or ULO. • Discussion on de-worming drugs, vitamins & minerals, vaccines, distilled water for vaccine dilution etc. • Show and participatory discussion on vaccine and chart as well • FO will careful during vaccine handling use flux for vaccine carrying. • Participatory discussion takes place on availability of services and on cool chain on vaccination. Discuss possibilities of collective action to better arrange these services.
7	2.5-3 hours (110 days after start)	<p>Participatory Epidemiology and Bio-security of poultry</p> <ul style="list-style-type: none"> • Recap • What is bio-security, why it is important • Disease causing agent that brought into farm? • How to prevent these causal agents from spreading disease? • House management and bio-security. • Group Dynamics-(The Magic Lamp) • FMA (Trial observation and information collection) • Conduct follow up survey on homestead garden • Closing Poultry module 	<ul style="list-style-type: none"> • Practical -Disease calendar will practices on mud or poster papers • Practice how to use potassium Permanganate (PPM) at farm level • BBT would be conducted at the end of the module. • Collect trial data and discuss results. • Make a cost benefit analysis. • Conduct follow up survey during follow up time. •

5. Curriculum on Nutrition Module

Table 1: Nutrition

No.	Duration	Activities	Notes
1	2 hours	<p>Food, nutrition, balance diet & malnutrition problem</p> <ul style="list-style-type: none"> • Food, Nutrition, Balance food, • Food classification on the basis of function (Practical) • Nutritional disorder and their remedies • Summary of day's activity and declaration of next day's programme 	<ul style="list-style-type: none"> • Collect all food ingredients • Use flip chart for different nutritional disorders • Participatory discussion and visualize by using materials.
2	2 hours	<p>Food, nutrition and care of infant, adolescent, pregnant & lactating mother</p> <ul style="list-style-type: none"> • Recap • Balanced food for different groups (infant, adolescent, pregnant, lactating, etc.) • Group Dynamic-(রাবার ব্যান্ড চালনা) • Make a comparison for the need of extra food for different age group • Summary of day's activity and declaration of next day's programme 	<ul style="list-style-type: none"> • Use flip chart and live samples
3	2-2,5 hours	<p>Safe food and food security. Safe water, water borne diseases, sanitary latrine</p> <ul style="list-style-type: none"> • Recap • Primary healthcare (Safe food, safe water, personal hygiene, immunization, water borne disease management, • Group Dynamic-(গাড়ি-নৌকা-বিমান) • sanitary latrine etc) (hand washing, making a symbolic latrine, cutting nails etc) • Summary of day's activity and declaration of next day's programme 	<ul style="list-style-type: none"> • All members participate practical parts
4	3 hours	<p>Proper cooking method, food processing and preservation</p> <ul style="list-style-type: none"> • Recap • Proper cooking, use vegetables from own garden, • Group Dynamic-(একত্রে রশি বাঁধা) 	<ul style="list-style-type: none"> • Ingredients collection for preparing hatch patch, egg halua and fruit salad •

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|--|--|--|--|
| | | <ul style="list-style-type: none">• Food preparation without loss any nutrition (Practical)• Conduct follow up survey on homestead garden | |
|--|--|--|--|

6. Curriculum on Livestock Modules (Beef fattening, Dairy Cattle and Goat&Sheep Modules)

Table- 5 : Small holder Beef fattening Module

No.	Duration	Activities	Notes
1	2 – 2.5 hours (0 days)	Introduction to the beef fattening module. <ul style="list-style-type: none"> Economic importance of Beef fattening Introduction to the different topics of this module Discussion on different breed and variety of cattle Production planning for beef fattening Planning for beef fattening sessions and trial 	<ul style="list-style-type: none"> Discussion on importance of cattle fattening Collect local breed/variety for live discussion if available Facilitate a detailed discussion on BF module and trial set up Practical production planning for beef fattening Make plan for total sessions with participatory discussions
2	2 – 2.5 hours (7 days)	Cattle housing management <ul style="list-style-type: none"> Recap Importance of a cattle housing Criteria of an ideal/improved cattle house Consideration for construction of a low cost cattle house Group dynamics(-(Ball Toss Game)Hygienic Management of cattle house Visit one housing system of any farmer and Trial set up on improved and traditional processes Sum up of day's activity and planning for next day's programme 	<ul style="list-style-type: none"> Showing ideal characteristics of cattle house, discussion will be held in front of one of the cattle house of farmers Collect locally available different housing materials and discuss how it can build with a lost cost. Discussion on different management of housing system Before setting a trial FO should select one beneficiary who will have at least 2-3 male cattle within the required age , repaired existing house or improved for trial, ensure manger for feeding and watering Maintain keeping record sheet or book/FFS register for economic analysis FO should Keep in mind that housing will be in south facing.
3	2 – 2.5 hours (15 day)	Cattle selection & de-worming of beef fattening <ul style="list-style-type: none"> Selection criteria of cattle for fattening Age and Body weight measurement (Using Body weight chart) (Practical) Group Dynamic (Making Pyramid) <ul style="list-style-type: none"> Farm Management Analysis (FMA) Brief discussion on de-worming and vaccination Administration of Tablet/Bolus (Practical) Sum up of day's activity and planning for next day's programme 	<p>Bring a cattle in front of farmers and practical discussion on selecting ideal characteristics of beef fattening cattle</p> <p>Showing how to control an ox</p> <p>Practical work on how to measure body weight of a cattle and discussion on its importance.</p> <p>Discussion on Farm Management Analysis (FMA) if not possible to do this job in the next day, it can be done increasing extra day.</p> <p>Hand on demonstration on Bolus/Tablets administration for this, FO will collect 3-4 vitamins tablets earlier.</p>

4	2-2.5 hours (21 days after starting)	Feeding management for beef fattening cattle <ul style="list-style-type: none"> Recap Introduction to different type of feeding technology and feeding system for beef fattening Thumb role feeding practices for beef fattening Demonstration of various types of concentrate feed ingredients One Kg ration (balance) formulation (Practical) Group Dynamics (The Magic Lamp) FMA Practice Hands on practice of Urea Molasses Straw (UMS) preparation Precaution of UMS and urea feeding Daily care and management of Cattle. Sum up of day's activity and planning for next day's programme 	<p>Collect different feeding materials for this sessions which are locally available</p> <p>Compare present and improve feeding practices</p> <p>Before doing these sessions, FO should collect feed ingredients for making one kg ration.</p> <p>Showing preparation of one Kg UMS practically and discussion on feeding method of UMS</p> <p>Four group Practice FMA, discussion on daily managements of beef fattening.</p> <p>Discussion on saline tolerant fodder and its cultivation methods, if requires, use extra one day for fodder cultivation</p> <p>FO will collect fodder cuttings and/seed for practical activities.</p> <p>Discussions on input supply chain related to value chain activities</p>
5	2-2.5 hours (30 days after starting)	Diseases prevention and primary health care <ul style="list-style-type: none"> Recap Introduction to the common infectious diseases (Bacterial and viral) of cattle Brief discussion on parasitic diseases Causes of parasitic disease Identification of ecto-parasites Control method for ecto parasites Group Dynamics (The Quiet Game) Vaccine and vaccination for cattle Identifications of different types of vaccines Primary health care <p>Sum up of day's activity and planning for next day's programme</p>	<p>Collect picture of healthy and unhealthy cattle or collect two live cattles of which one is cachectic and other is healthy or project can develop this materials</p> <p>FO will collect poster or leaflet for parasitic infestation for cattle from different pharmaceuticals company or from ULO or project will develop these training materials</p> <p>Identification of ecto parasites from affected cattle and discussions on its controlling methods</p> <p>Discussion on de-worming drugs, vitamins & minerals, vaccines,</p> <p>Show and participatory discussion on vaccine and chart as well and source of vaccine and vaccinators</p> <p>Discuss possibilities of collective action to better arrange these services.</p>
6	2-2.5 hours (120 days after starting)	Marketing <ul style="list-style-type: none"> Recap Preparation of cattle for showing Feeding before and during marketing Final observation, analysis and conclusion of trial results Cost benefit analysis (Tentative) Field day and conclusion of the training. 	<p>FO will select cattle for showing /Field day</p> <p>Ensure farmer to participate in departmental showing also</p> <p>Discussion on feeding during and before marketing</p> <p>Discussions on role and linkages with different actors of beef fattening value chain</p> <p>Sharing of result of trials and gross margin (GM)</p>

Table 6: Small holder Dairy cattle Module

No.	Duration	Activities	Notes
1	2 – 2.5 hours (0 days)	Introduction to the Dairy cattle module. <ul style="list-style-type: none"> Introduction to the different topics of this module Economic importance of small scale 	<p>Discussion on importance of dairy farming</p> <p>Collect local breed/variety for live discussion if available</p> <p>Facilitate a detailed discussion on SDC</p>

		<p>dairy farming</p> <ul style="list-style-type: none"> • Production planning for dairy cattle • Planning for dairy cattle sessions and trial 	<p>module and trial set up</p> <p>Practical -production planning for dairy cattle</p> <p>Make plan for total sessions with participatory discussions</p>
2	2 – 2.5 hours (7 days)	<p>Cattle housing management</p> <ul style="list-style-type: none"> • Recap • Importance of a cattle housing • Criteria of an ideal/improved cattle house • Consideration for construction of a low cost cattle house • Group dynamics (Open Cap of Bottle) • Hygienic Management of cattle house • Visit one housing system of any farmer and Trial set up on improved and traditional housing • Summary of day's activity and declaration of next day's programme 	<p>Showing ideal characteristics of cattle house, discussion will be held in front of one of the cattle house of farmers</p> <p>Collect locally available different housing materials and discuss how it can build with a lost cost.</p> <p>Discussion on different management of housing system</p> <p>Before setting a trial FO should select one beneficiary who will have at least 2-3 male cattle within the required age , repaired existing house or improved for trial, ensure manger for feeding and watering Maintain keeping record sheet or book/FFS register for economic analysis</p> <p>FO should Keep in mind that housing will be in south facing.</p>
3	2.-2.5 hours (21 days after starting)	<p>Feeding management for cattle (Concentrate and fodder)</p> <ul style="list-style-type: none"> • Recap • Participatory discussion feed and fodder • Balance feed • Considerations of feed formulation • Feed requirement for different stages of cattle • Ration formulation (Practical) • Thumb rules method of feeding • Group Dynamics (Cattle Buying) • Introduce different types of fodder available in Bangladesh • Cultivation pattern of fodder • Hands on practice on fodder cultivation • Demonstration of fodder cultivation • Relevant input supplies for cattle • Summary of day's activity and declaration of next day's programme 	<p>Collect different feeding materials for this sessions which are locally available</p> <p>Compare present and improve feeding practices</p> <p>Before doing these sessions, FO should collect feed ingredients for making one kg ration.</p> <p>Showing differences of feeding stage in respect to production</p> <p>Discussion on different fodder crop and identifying of fodders.</p> <p>Hands on cultivation of fodder</p> <p>Discussion on saline tolerant fodder and its cultivation methods, if requires, use extra one day for fodder cultivation</p> <p>FO will collect fodder cuttings and/seed for practical activities.</p> <p>Discussions on input supply chain related to value chain activities</p>
4	2 – 2.5 hours (40 days)	<p>Breeds, breeding and care/management of pregnant Cow</p> <ul style="list-style-type: none"> • Recap • Dairy cattle breeds available in Bangladesh with characteristics. • Heat detection and breeding time • Importance of Artificial Insemination and cross breeding • Group dynamics (Land allocation) • Farm Management Analysis (FMA) 	<p>If available, bring local and cross breed cattle and discussion its characteristics</p> <p>Show how to identify heat and discussion on breeding time and when and how AI should done.</p> <p>Practice FAM .</p> <p>Discussion and showing milking characteristics of a cow. How to take care of pregnant cow. then share pre and post</p>

		<ul style="list-style-type: none"> • Selection criteria for milking cow • Care and management of pregnant cow • Pre, during and post parturition care and management of cow 	parturition care.
5	2 – 2.5 hours (50 days)	Care / Management of milking cow, heifer and calf <ul style="list-style-type: none"> • Recap • Care and management of newborn calf • Care and management of heifer • Care and management of lactating cow and dry cow • Group dynamics (Dystocia) • Farm Management Analysis (FMA) • Hand milking practices • Relevant input supplies for cattle • Summary of day's activity and declaration of next day's programme 	FO will show practical calf feeding and others care he or she should collect one heifer and lactating cow and do practical on milking system. FO will collect milking pot or tub and showing to clean tub, milkers hand and how to maintain hygiene of milking parlour at farm. Practice FMA.
6	2-2.5 hours (75 days after starting)	Diseases prevention and primary health care <ul style="list-style-type: none"> • Recap • Introduction to the common infectious diseases (Bacterial and viral) of cattle • Brief discussion on parasitic diseases • Causes of parasitic disease • Identification of ecto-parasites • Control method for ecto parasites • Group Dynamics (Make square with rope) • Vaccine and vaccination for cattle • Milk fever and mastitis control program • Identifications of different types of vaccines • Primary health care • Summary of day's activity and declaration of next day's programme 	<p>Collect picture of healthy and unhealthy cattle or collect two live cattle of which one is cachectic and other is healthy or project can develop this materials</p> <p>FO will collect poster or leaflet for parasitic infestation for cattle from different pharmaceuticals company or from ULO or project will develop these training materials</p> <p>Identification of ecto parasites from affected cattle and discussions on its controlling methods</p> <p>Discussion on milk fever with pictures and its control protocol.</p> <p>Discussion on de-worming drugs, vitamins & minerals, vaccines,</p> <p>Show and participatory discussion on vaccine and chart as well and source of vaccine and vaccinators</p> <p>Discuss possibilities of collective action to better arrange these services.</p>

Table 7: Small holder Goat and Sheep module

No.	Timing and Duration	Activities	Notes
	2-3 hours	<ul style="list-style-type: none"> • Farmer Selection for FFS • Benchmark survey of selected Farmer for Goat & Sheep rearer 	Household visit & individual interview
1	2 – 2.5 hours (0 day)	Introduction of Livestock Module (Goat and Sheep) <ul style="list-style-type: none"> • Introduction of FFS approach, objective & activities. • Discussion on different breed and variety of sheep and goat • BBT (Ballot Box Test) if single module only 	<ul style="list-style-type: none"> • Discussion on importance of FFS approach for Goat and Sheep rearing • Collect materials for Ballot Box test and organize Ballot Box test • Facilitate a detailed discussion on Goat and Sheep rearing module

No.	Timing and Duration	Activities	Notes
		<ul style="list-style-type: none"> • Introduction to the different topics of this module • Expectation of participants on Goat & sheep rearing • Horizontal learning method and role of the participants 	<ul style="list-style-type: none"> • Make a expectation list in a participatory way • Discussion on horizontal learning and its importance and make a way out • Make plan for total sessions with participatory discussions
2	1.5-2 hours (15 days after starting)	<p>Economic importance and production Planning</p> <ul style="list-style-type: none"> • Economic importance of goat and sheep rearing at homestead level • Production planning for goat and sheep • What is trial set up and objectives of trial set up for goat & sheep rearing • Discussion on benchmark data 	<ul style="list-style-type: none"> • Discussion on importance of livestock rearing at homestead level • Making production plan for Goat and Sheep rearing • Discussion on trial set-up, its importance • Discussion on benchmark survey and do Practical on production planning for Goat & Sheep rearing
3	2-2.5 hours (30 days after starting)	<p>Goat & Sheep housing Management</p> <ul style="list-style-type: none"> • Recap • Economic importance of Goat and Sheep housing • Locally available low cost material for housing • Criteria for ideal Goat & Sheep housing. • Demonstration of an ideal Goat and Sheep housing system • Demonstration of setting housing at the household level • Measurement of an ideal house for goat and Sheep • Group Dynamics () • Theoretical discussion on Farm Management Analysis (FMA) • Practical session on FMA • Trial set up on improved and traditional rearing system of Goat/Sheep (break down into housing, feeding, vaccination and de-worming etc) • Discussion on inputs supplies for goat and sheep • Summary of day's activity and declaration of next day's programme 	<ul style="list-style-type: none"> • Discussion on economic importance of Goat and Sheep housing • Showing ideal characteristics of housing, discussion will be held in front of one of the feasible farmer house • Collect locally available different housing materials and discuss how it can build with a lost cost. • Discussion on set-up demonstration on ideal housing • Discussion on different management of housing system • Discussion on Farm Management Analysis (FMA). Four groups will do practical on it. • Before setting a trial FO should select one beneficiary who will have at least 2-3 Goat and Sheep. Repaired existing house or improved for trial, ensure manger for feeding, vaccination de-worming and watering. Maintain keeping record sheet or book/FFS register for economic analysis • FO should Keep in mind that housing will be in south facing.

No.	Timing and Duration	Activities	Notes
4	2-2.5 hours (45 days after starting)	Special care of pregnant goat & kids <ul style="list-style-type: none"> Recap Importance of breeding through natural service by good quality buck. Importance of pregnant goat and kid care Heat detection & timing of insemination of Doe. Participatory discussion on care during pregnancy and parturition Observation of symptoms of pregnant goat. Check pregnancy by hand (Practical) Demonstration of different Material used for delivery period Group Dynamics Care and management for Kids & Mother just after parturition (Hands on practice on kids respiration after delivery, Disinfectants use and cutting of umbilical cord, Cosy environment,) Importance & proper time of castration of Kids Importance of colostrums feeding for the Neoborn kids Feeding management for more than two kids Relevant input supplies for goat and sheep Summary of day's activity and declaration of next day's programme 	<ul style="list-style-type: none"> Discussion on importance of special care for pregnant goat and sheep Discussion on importance of special care for kid Discussion on heat detection and timing of insemination of Doe. Practical session on pregnancy detection, demonstration on different materials used for delivery period. Practical on care of mother and kid after delivery Discussion on importance of colostrums of kids. Discussion on feeding management of kid Relevant input supplies for goat and sheep
5	2 hours (60 days after starting)	Feed management for goat & sheep <ul style="list-style-type: none"> Recap Introduction to Different feeding system of small Ruminant Participatory discussion on local feeding system Types of feed Feed used for different stage of goat and sheep Group Dynamics () Demonstration of different feed ingredients One kg concentrate Ration formulation for Goat /sheep From Locally available low cost feed materials Relevant input supplies for goat and sheep Trial observation & group presentation Summary of day's activity and declaration of next day's programme 	<ul style="list-style-type: none"> Discussion on different feeding system, participatory discussion on local feeding system and types of feeding FO will Collect different feeding materials for this sessions which are locally available Introduction of feed ingredients among the FFS members Practical on preparation of one kg concentrated ration for goat and sheep.
6	2.2.5 hours (75days after starting)	Health Management of Goat & sheep <ul style="list-style-type: none"> Recap Causes of diseases in goat / sheep Brief discussion on infectious/non-infectious/parasitic/protozoal diseases parasitic diseases Identification of common ecto parasites & Control measures for ecto parasites Group Dynamics () Importance of de-worming of small Ruminant 	<ul style="list-style-type: none"> Discussion on causes of disease in goat/sheep Discussion on infectious/non-infectious/parasitic/protozoal diseases parasitic diseases Identification of ecto parasites from affected goat/sheep and discussions on its controlling methods Discussion on de-worming drugs,

No.	Timing and Duration	Activities	Notes
		<ul style="list-style-type: none"> • Importance of Vaccination for disease control (Demonstration of different types of vaccine & their application method) • Importance of cleaning and disinfection for disease control. • Summary of day's activity and declaration of next day's programme 	<p>vitamins & minerals, vaccines,</p> <ul style="list-style-type: none"> • Show and participatory discussion on vaccine and chart as well and source of vaccine and vaccinators • Discuss possibilities of collective action to better arrange these services. • Discussion on preventive measure like cleaning and disinfection for disease control.
7	1-1.5hours (120 days after starting)	<p>Field day and Result sharing</p> <ul style="list-style-type: none"> • Field Day • Result Discussion • Cost-benefit analysis 	<ul style="list-style-type: none"> • FO will organize field day • Trial farmer will explain his/her experience regarding traditional and improved methods benefits • Live demo will show to invited farmers • Result will be explained to the audience.

7.Carp-Golda Mix Culture Module

Table 8: Carp-Golda mix culture

No.	Timing and Duration	Activities	Notes
1.	2-3 hours	<ul style="list-style-type: none"> Farmer Selection for FFS Bench Mark survey of Selected Farmer for fisheries 	Household visit & individual interview
2.	2 – 2.5 hours (0 day)	<p>Introduction of Module (Carp-Golda)</p> <ul style="list-style-type: none"> Introduction of FFS approach, objective & activities. BBT (Ballot Box Test) <ul style="list-style-type: none"> Introduction of the module and its objectives Participatory discussion on bench mark survey (present situation) Opportunities of the locality for fish culture Group dynamics/Ice break Visit selected demo/trials and observation sharing Summary of the day and plan for next session 	<ul style="list-style-type: none"> Introduce each other between selected participants and FO, and discuss about the modules activities, FFS approach, month wise session work and objectives. Prior to the session, the facilitator will summarize bench mark survey information for carp – golda mix culture and share with the participants about their scope in area, present culture techniques , advantage and disadvantages, different problems of fish culture, , their production rate, marketing and potentialities etc. Give them an impression that they can improve their production rate more than the present situation and try to set goals for production increase. FOs will discuss with the participants about their major problems for fish cultivation in their pond. Then FO will ask them how these problems could be solved. After the discussion, FO will plan some trials to be implemented by the FFS participants for experiential learning through learning by doing process. Then one selected trial can be visited on that day to know the present situation of pond and what will be done. Discuss with farmers about availability of quality fingerlings, fertilizers, marketing scope etc. Discuss if collective action (e.g. at WMG level) can solve input and marketing related problems. Lastly, FO will summarize the session and inform the next session topic, dates and time, and end the session with vote of thanks to all participants. FOs will start follow up visit in each and every participant's pond to observe the present situation to enrich the next session activities in proper ways.

No.	Timing and Duration	Activities	Notes
3.	2 – 2.5 hours (after 30-40 days)	<p>Pond preparation and pre-stocking How can we start fish culture in ponds? Planning for fish culture A) Pre stocking management B) Stocking management C) Post stocking management</p> <p>A) Pre stocking management</p> <ul style="list-style-type: none"> • Sharing of follow up visit with participants • Repairing of pond dykes (why, how & when) with participatory discussion • Remove of excess muddy soil (why, how & when) • Remove of long branch of trees & bush from dykes (why, how & when) • Removal of unwanted and carnivorous fish by dewatering, netting & rotenone (why, how & when) • Group dynamics/ice break • Field visit to understand the activities on above discussion • Sharing of knowledge with surrounding fish farmer of WMGs (horizontal learning) • Conclusion discussion of the day and plan for next session 	<ul style="list-style-type: none"> • Wel- come the participants firstly and recap the last session. • Through participatory way, FO should discuss with the participant from follow up visit information, after that they can share the FFS activities like how to start fish culture in your area. • FO should give some message to participants, which ponds are suitable or not, what are problems, and future scope for development. • FO will take special attention to participants through active participatory discussion about repairing of dykes, remove excess of muddy soil from bottom, remove of long branch trees, inform carnivorous species and how to remove of unwanted and carnivorous fish from pond (why and, when). • After that take the participants to the nearby trial field and show them present situation of the trial on pond dyke. excess muddy bottom soil and any long branch trees etc. • Show the carnivorous and unwanted fish through netting in the pond and inform negative side of these fishes. Give them some idea how to remove these fishes through repeated netting or dewatering or by applying rotenone powder, and how they use the rotenone powder in pond, when and how. • Give them some idea about quality rotenone powder, its price, and where its availability. • Lastly, FO will advise to participants to sit U shaped ways and recall all activities of this session through active participation through two ways communications, and FO also can ask individually to ensure clear ideas about the topics.
4.	2-2.5 hours (after 60 days)	<p>Pre stocking management</p> <ul style="list-style-type: none"> • Application of lime (why, how & when) • Application of organic & inorganic fertilizer (why, how & when) • Examination of natural feed (why, how & when) • Test of toxicity of water (why, how & when) • Sharing of knowledge with surrounding fish farmer • Practical work on above discussion in 	<ul style="list-style-type: none"> • FO can discuss the last follow up visit of participant's ponds where their lacking the fish culture technology in pond and how to solve this to achieve the target. • Discuss about the importance of lime, organic and inorganic fertilizer in pond, amount of doses of lime and fertilizer, how and when it will be used in culture pond. • Invite all the participants to go to the

No.	Timing and Duration	Activities	Notes
		<p>trial pond</p> <ul style="list-style-type: none"> Summary discussion of the day and plan for next session 	<p>trial pond for practical work on lime and fertilizer application which is required or not, show them practically through use of litmus paper for testing PH range for liming, and use of sechi disc and drinking water glass for natural feed testing. All practical events should be done through involvement of all participants actively.</p> <ul style="list-style-type: none"> FO will also show the test of toxicity in pond water, using hapa or silver pot through direct participation of participants. FO can talk with participants, how to learn the surrounding farmers for horizontal learning. Discuss about input supply through collectively at WMG or FFS level to save time, price and quality inputs. At the end, FO will recall the whole session activities and declare the next session topic, time and date and end the session with vote of thanks
5.	2-2.5 hours (after 80-85 days)	<p>Stocking Management</p> <ul style="list-style-type: none"> Selection of species (depend on farmer opinion, pond size & depth) Identification of quality fingerlings (why & how) Treatment of fingerlings (why, when & how) Size of fingerlings stocking (why) Number of fingerlings stocking (depend on mix culture & mono culture considering seasonal & perennial pond such as carp-golda; carp, golda & mola ; carp & tilapia; carp & pangus; and koi, sing & magur etc) Fry/fingerling transportation Techniques of fingerlings adaptation Technique of fingerling release (why, when & how) Sharing of knowledge with surrounding fish farmer Practical work on above said discussion in trial field Summary discussion of the day and plan for next session 	<ul style="list-style-type: none"> Talk about the last session and follow up visit of participant ponds. FO will discuss the selection of species depending on pond size, depth, culture type and water layer etc. Discuss can be carried out on identification of quality fingerlings,, treatment process, and stocking number of different species on pond size and depth. FO will discuss on fingerling adaptation and release, and its importance, when and how? All participants will go to trial pond and do all above said activities with direct involvement and instruction of FO. FO should talk about horizontal learning among the surrounding farmers of WMG and BG area. At last, FO will recall the whole session activities and declare the next session topic, time and date and end the session with vote of thanks

No.	Timing and Duration	Activities	Notes
6.	2-2.5 hours (after 110-115 days)	Post Stocking Management <ul style="list-style-type: none"> • Sharing of follow up visit with participants • Application of fertilizer and its amount dose (why, when & how) • Types of supplementary feed, its dose amounts on stocking considering species density, and culture types, and its application procedure (why, when & how) • Sampling (why, how and when) • Shelter for Golda (why, when & how) • Techniques of sharing of knowledge with surrounding fish farmer • Practical work in trials • Conclusion of the day and plan for next session 	<ul style="list-style-type: none"> • Through participatory discussion, recap the last session and follow up visit of the FO on participant ponds. • Talk about the types of natural and supplementary feed, home made and industrial made feed etc, and its dose amount and ratio of composition, depending on stocking number of species and culture types. FO will discuss about feed supply techniques and its appropriate procedure and time. • Discuss about shelter of Golda and making procedure, why and when is good. • Talk about fish sampling and its importance and learn about the calculation of supplementary feed amount of dose is required in their ponds with different ratio & types of feed. • FO will invite participants to go to trial pond for practical activities. FO will conduct the whole practical work on above said discussion with direct involvement of all participants and the same time FO would discuss on practical activities. • Discussion on sharing of knowledge with surrounding WMG fish farmers for horizontal learning.
7.	2-2.5 hrs (after 170 days)	Post stocking management (Cont.) <ul style="list-style-type: none"> • Sharing of follow up visit with participants • Pond bottom raking (why, when & how) • General discussion on different problems and solution of fish culture • Partial harvesting and restocking of fish (why and when) • Marketing • How to share the knowledge with surrounding fish farmer • Practical work on above discussion in trial pond • Conclusion discussion of the day and plan for next session 	<ul style="list-style-type: none"> • Talk about the last session and follow up visit of participant ponds. • FO will discuss about pond bottom raking for removing gas from pond water. • Discuss about some general problems of fish culture like deficiency of oxygen in pond water, turbidity of water, green/red layer on the surface of pond water and gas bubble in water, and how to solve/remove from fish culture pond. • FO will talk about advantages of partial harvesting of fish and which species and size is good or bad. And which species is better for restocking. • Discuss with participants about fish selling, marketing time, season and marketing chain etc and how to conduct the whole activities with collective ways with WMG members. • All participants will go to trial pond side to do the work practically for bottom raking activities and to observe the suitable size of partial harvesting of fish and the same

No.	Timing and Duration	Activities	Notes
			<p>time, FO will talk about on practical activities.</p> <ul style="list-style-type: none"> • FO should talk about horizontal learning among the surrounding farmers of WMGs and BG area. • At the end, FO will recall the whole session activities, and declare the next session topic, time and date, and end session with vote of thanks

No.	Timing and Duration	Activities	Notes
8.	2-2.5 hrs (after 210 days)	<p>Fish disease management</p> <ul style="list-style-type: none"> • Sharing of follow up visit with participants • Fish disease and its prevention (symptom, prevention & treatment) • Discussion of demo/trial in seasonal ponds and conclusions on fish production activities • How to share the knowledge with surrounding fish farmers • Discussion on linkage with marketing and value chain • Conclusion discussion of the day and plan for next session 	<ul style="list-style-type: none"> • Discuss about the last visit of participant ponds, what they have done and recap the last session. • Discuss different disease of fish like white spot disease, tail rotten disease, dropsy diseases etc what are the main causes, and its symptom, prevention and treatment. During session, FO will arrange some diseases fish for better understanding participants. • FO will invite the participants to go to trial pond to observe it in trial fish pond, which species is good or which is diseases affected fish, it may be arranged through harvesting of fish by proper netting. • Discussion on appropriate price of fish (when & how) and how to linkage between participants (growers) and marketing peoples, it may be conducted through collectively with FFS farmers/WMGs members. • At last, FO will recall the whole session activities, and declare the next session topic, time and date, and end the session with vote of thanks

No.	Timing and Duration	Activities	Notes
8.	3-4 hrs (after 270-280 days)	<p>Final harvesting, experience sharing and cost benefit analysis</p> <ul style="list-style-type: none"> • Recap the culture technology through skilled demo /trial farmer • Final harvesting of fish • Sharing of experience (weakness, good & bad side) with other FFS farmer and surrounding fish farmers • Sharing of cost and benefit analysis with FFS farmers. • Distributing prize in the first and second best farmers 	<ul style="list-style-type: none"> • Arrange a field day at suitable place and time • Minimum 3 skilled farmers mainly the trial operated farmers would describe their good/ bad experience of BG, FFS to share the other FFS participants and surrounding farmers of BG (minimum 150 participants). Here not that floor will be open to all for fruit full discussion and to enrich FFS activities that which will be very helpful to implement the next year FFS activities. • Sometimes will be allocated to describe cost and benefit analysis in session. • Prize will be distributed among the best farmers mainly in first and second farmer to enhance the FFS activities among the surrounding fish farmers. • At the end of field day, Blue Gold will request them to continue their fish culture activities and also to request them to share and spread their knowledge to surrounding farmers and end the session with lot of thanks.

Table-9: Curriculum for DAE-FFS (Crop, Homestead garden and Nutrition module)

No.	Timing and Duration	Activities	Notes
0	2-3 hours (0 days)	<ul style="list-style-type: none"> Farmer Selection for FFS Bench Mark survey of Selected Farmer <p>Before FFS</p> <p>(Facilitators along with tag SAAO will organize a meeting with the possible FFS farmers of a WMG formed by Blue Gold Program. In some places, FFS Organizers (FO) of Blue Gold already prepared a list of interested participants through a community meeting. The list should be taken into consideration. This preparation should start at least 2-3 weeks before seedbed preparation.)</p>	<p>Preparation should be start at least 2-3 weeks before seedbed preparation . These include:</p> <ul style="list-style-type: none"> Contacting the WMG committee and discuss the planning of the FFS Comunicate with FO of BlueGold programme and collect a list of interested participants already prepared through community meeting Site selection for the FFS Selection of 25 farm families (man and wife/daughter/in law) Benchmark survey Identify the local crop production constraints after discussing with the farmers Site selection for trial plots. Collection of seeds for trials/observation plots Collection of vegetable seeds for ails crops Preparation of materials for ballot boxes (prepare separate questions, 10 for male farmers (rice/field crop) and 10 for female farmers (homestead garden and nutrition) Purchase & collection of FFS materials.
1.	3-4 hours	<p>Introductory session (Before seedbed preparation)</p> <ul style="list-style-type: none"> Pre FFS ballot box test for men and women Introduction to Farmer Field School (FFS) Norms and Expectations for FFS participants Horizontal learning Presentation of main subjects for each of the 20 sessions. Presentation of the budget for the FFS and list of materials Group formation Group Dynamics: Role plays to present the name of the groups. Brief inauguration of the FFS Discussion on value chain Production target Summarize and planning for next session <ul style="list-style-type: none"> Both man and women farmer will attend the session 	<ul style="list-style-type: none"> Material collection for conducting BBT Discussion on imporatnce of FFS, main topics, total sessions and norms of FFS Prepare expectations list Discuss the importance of group work and form groups for women and for men Discussion on agriculture value chain i.e. availability of improved vegetable seeds, fertilizers, and other production related inputs and services After participatory discussion make a production target Discuss on horizontal learning methods and role of the participants
2.	4 hours	<p>Quality seed selection and ideal seed bed preparation (Time of seed bed preparation)</p> <ul style="list-style-type: none"> Recap Special topic on seed health Ideal seedbed preparation and sowing Group Dynamics (e.g. "List as many as you can") Importance of organic manure Soil test 	<ul style="list-style-type: none"> Characteristics of good quality seed, seed selection, sorting of seeds, germination test of vegetables and rice (discussion and practical) Discussion on ideal seed bed preparation and seed sowing ((establish within this week). Discussion on importance of organic manure

No.	Timing and Duration	Activities	Notes
		<ul style="list-style-type: none"> - Summarize and planning for next session • Both man and women farmer will attend the session 	<ul style="list-style-type: none"> - Testing soil types of farmer's fields and effect of organic matter on it (practical)
3.	3-4 hours	<p>Homestead Garden</p> <ul style="list-style-type: none"> - Recap - Germination test. - Introduction to homestead garden management - Importance of vegetable production in homesteads - Year round vegetable selection - Group dynamics/ Ice break - Homestead space planning and trial set up (plan wise vegetable/fruit cultivation utilizing different places of a farm house) • Only women will attend this session 	<ul style="list-style-type: none"> - Observation and short discussion on results of germination test (Plot visit for germination test) - Discussion on importance of homestead garden management - Vegetable calendar preparation for month wise vegetable selection - Farm house visit for space planning and trial set-up
4.	3-4 hours	<p>Fertilizer management (Before transplanting)</p> <ul style="list-style-type: none"> - Recap - Observation of germination test & seed bed and discussion on it. - Group Dynamics: "Message relay" - Fertilizer recommendation on the basis of AEZ for study plots and that locality - Adjustment of different chemical and organic manure - Functions of different fertilizers and their deficiency symptoms (with sample or picture) - Discussion on input supply related to market orientation (discuss where they get quality seed and fertilizer and how to improve the situation. Can they take any collective action, for example as WMG group?) - Discussion on preparation of different trial observation plots - Summarize and planning for next session. • Only man will attend this session 	<ul style="list-style-type: none"> - Discussion on germination test and seed bed preparation (Plot visit) - Discussion on chemical and organic fertilizer and make recommendation on the basis of AEZ - Discussion on functions of different fertilizer
5.	3-4 hours	<p>Fertilizer management cont. (Transplanting time)</p> <ul style="list-style-type: none"> - Recap - Uprooting and transplanting technique - Discuss and set-up the study/observation plots * ICM plot versus FP plot * Variety study plot * Saving urea fertilizer study plot (compare granular and prilled urea) - Summarize and planning for next session. 	<ul style="list-style-type: none"> - Visit study plot - Practical on uprooting and transplanting technique

No.	Timing and Duration	Activities	Notes
		<ul style="list-style-type: none"> • Only man will attend this session 	
6.	3-4 hours 7 DAT	<p>Fertilizer and Pest management</p> <ul style="list-style-type: none"> - Recap - Discuss and set-up study/observation plots: Insect Zoo (IZ) - Application of USG in Urea fertilizer save method study plot - Adverse effect of pesticides and how to reduce risk of pesticides (discussion and role play) - Discussion on effect of salinity on rice production and adaptation options - Summarize and planning for next session. 	<ul style="list-style-type: none"> - Field work on study plot set-up/observation - Practical on fertilizer application
7.	3-4 hours	<p>Homestead Garden</p> <ul style="list-style-type: none"> - Recap - Vegetable production technology in homestead (practical) and trial set up on "Vegetable production management": - Collection, sorting, identification of pest and diseases sample of existing vegetables - Set up vegetable insect zoo - Group dynamics/ ice break - What is AESA, why and how to conduct AESA in homestead garden - Summarize and planning for next session. • Only women will attend this session 	<ul style="list-style-type: none"> - Trail set-up. - Set-up vegetable insect Zoo - Practical work on AESA
8.	3-4 hours 21 DAT	<ul style="list-style-type: none"> - Recap - Observe insect zoo and reset the insect zoo, if necessary - Set-up observation plots on detillering and defoliation - Sorting, collection and identification of pests and defenders - GD: "Role play on predation" - Discussion: Introduction to the concept of Agro-ecosystem. What is Agro Ecosystem Analysis (AESA)? How to do AESA? - Summarize and planning for next session. • Only man will attend this session 	<ul style="list-style-type: none"> - Practical on collecton and identifying pests and defenders
9.	3-4 hours	<p>Homestead Garden</p> <ul style="list-style-type: none"> - Recap - Assessment of demand of fruit cultivation in FFS locality - Month wise fruit selection planning for year round fruit supply - Group dynamics - Sapling selection and planting techniques 	<ul style="list-style-type: none"> - Sapling selection and planting techniques (practical) - Demonstration set up on New fruit/ new variety of a fruit sapling transplantation" - Fruit tree management (discussion and practical) (fertilizer management, water management and pruning

No.	Timing and Duration	Activities	Notes
		<ul style="list-style-type: none"> - Demonstration set up on New fruit/ new variety of a fruit sapling transplantation” - Fruit tree (fertilizer management, water management and pruning) - Insect zoo (vegetable) observation and reset - Summarize and planning for next session. • Only women will attend this session 	<ul style="list-style-type: none"> (practical) - Insect zoo (vegetable) observation and reset (Practical) -
10.	3-4 hours 35 DAT	<ul style="list-style-type: none"> - Recap - Observation of Urea fertilizer save trial and insect zoo - Collection and identification of rice disease sample - Group Dynamics. “Water Brigade” - Practice AESA-1 - Management of important existing/current pest in the field (insect and/or disease) - Progression on horizontal learning - Summarize and planning for next session. 	<ul style="list-style-type: none"> - Practical on sample collection and identification of rice disease
11.	2.5-3 hours	<p>Nutrition</p> <ul style="list-style-type: none"> - Recap - Introduction to Food and Nutrition - Food classification on the basis of function (practical) - Group dynamics / Ice break - Food, Nutrition and nutritional disorder and their remedies - Summarize and planning for next session. • Both man and women will attend this session 	<ul style="list-style-type: none"> - Poster , leaf let, flip chart - Food classification on the basis of function (practical)
12.	3-4 hours 49 DAT	<ul style="list-style-type: none"> - Recap - Observation of insect zoo, Detillering and Defoliation study - Review if decisions from AESA-1 were implemented - Practice AESA-2 - Management of important existing pest in the field (insect and/or disease) - Special Topic: Soil health management (exercise on nutrient mining and nutrient flow) - Summarize and planning for next session. 	<ul style="list-style-type: none"> - Practical on AESA-2 -
13.	3-4 hours 56 DAT	<ul style="list-style-type: none"> - Recap - Observation of insect zoo, Detillering and Defoliation study - Collection Sorting, and identification of pests and defenders of rice - Review if decisions from AESA-2 were implemented - Practice AESA-3 - Special topic: Conservation and Augmentation of Natural Enemies (parasitoids and predators) 	<ul style="list-style-type: none"> -

No.	Timing and Duration	Activities	Notes
14.	3-4 hours	<p>Homestead Garden</p> <ul style="list-style-type: none"> - Recap - Collection, sorting, identification of pest, diseases and nutritional disorder sample of existing fruits - Problem identification of existing fruit trees and their integrated management and trial set up on “Improve techniques of fruit bearing plant management” - Insect zoo (vegetable) observation and reset - Group dynamics/Ice break: Searching lost items - Importance of organic manure and Farm Yard Manure (FYM) production and trial set up on ‘Farm Yard Manure production’ • Only women will attend this session 	<ul style="list-style-type: none"> - Problem identification of existing fruit trees and their integrated management (practical) - Trial set up on “Improve techniques of fruit bearing plant management” (practical) - Trial set-up on ‘Farm Yard Manure production’(practical)
15.	3-4 hours 63 DAT	<ul style="list-style-type: none"> - Recap - Observation of insect zoo and varietals trial. - Group Dynamics: “Role play on seed” - Seed production techniques and practice roughing - Discussion on seed production techniques and practice roughing - Valu chain for seed production - Management of important existing/current pest in the field (insect and/or disease) - Summarize and planning for next session. 	<ul style="list-style-type: none"> - Discussion on seed production techniques and practice roughing (Practical) - Discussion on seed production as a collective business if the participants could take with the assistance of WMG. If they agree, Blue Gold can arrange additional training for groups to do this)
16.	3-4 hours 77 DAT	<ul style="list-style-type: none"> - Recap - Observation of insect zoo and urea fertilizer save trial - Review if decisions from AESA-3 were implemented - Practice AESA-4 - Group Dynamics: “Titanic” - Discussion on market orientation - Management of important existing pest in the field(Insect/disease) - Summarize and planning for next session. 	-
17.	3-4 hours 17 th session For women	<p>Homestead Garden</p> <ul style="list-style-type: none"> - Recap - Practice on AESA -1(Vegetables) - Adverse effect of pesticide (role play) and adverse effect of chemicals used for fruit ripening & vegetable processing - Collection, sorting, identification of pest and diseases sample of vegetables and their integrated management - Summarize and planning for next session. • Only women will attend this session 	-

No.	Timing and Duration	Activities	Notes
18.	2.5-3.0 hours 18 th session For man and women	<p>Nutrition</p> <ul style="list-style-type: none"> - Recap - Balance food and Importance of balance food - Balanced food for different groups (infant, adolescent, pregnant, lactating, etc.) (Making comparison for the need of extra food for different age group) - Group dynamics/ Ice break - Safe food and food security - Proper cooking, use vegetables from own garden without loss any nutrition (practical) - Summarize and planning for next session. • Both man and women will attend this session 	-
19.	3-4 hours 19 th session	<p>Homestead Garden</p> <ul style="list-style-type: none"> - Recap - Practice on AESA -2(Fruits) - Collection, sorting, identification of pest, diseases and nutritional disorder sample of existing fruits - Group dynamics/Ice break - Management of pest, diseases and nutritional disorder of fruit using IPM concepts - Trial plots (vegetable and fruit) observation and discuss results and make conclusions on fruits and vegetables - Summarize and planning for next session. - Only women will attend this session 	-
20.	-	<p>Field day session</p> <p>4 hours</p> <p>Before harvesting time (= with crop still in field, but no yield data available) or After harvest (no crop in field, but all yield results are available)</p>	<ul style="list-style-type: none"> - Registration - Group formation, - Field and booth visit. <ol style="list-style-type: none"> 1. ICM Component booth: Banners, explanation of what is ICM, including the ail crops, LCC and USG, show fertilizer recommendations on the basis of AEZ, plant nutrition, nutrient mining and nutrient flow, results from observation (if AEZ based fertilizer recommendation) 2. AESA booth (rice & vegetables): Explain AESA, Pests and Defenders, augmentation and conservation, Insect Zoo, Results of DT & DF 3. Pesticides booth: Adverse effect of pesticides and risk reduction: showing adverse effect and how to reduce risk while transportation, storage, spraying, etc.

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			<p>4. Seed booth: Seed health, seed germination , seed production, storage and preservation, results from variety study plots etc</p> <p>5. Improved homestead activities: Showing homestead vegetable garden, information on human nutrition and cooking, improved stove, FYM, tree plantation, management of fruit trees, results from homestead related observation plots etc.</p> <p>Big group presentations:</p> <ul style="list-style-type: none"> - A male farmer summarizes what they have done and learned in the FFS (max 5 minutes) - A female farmer summarizes what the women have done and learned in the FFS (max 5 minutes) - Two persons (male and female) present their plans for collective actions (each max 5 minutes) - Rewarding of the best female and best male farmers. - Distribution of certificates to FFS farmers (if all sessions completed)

