

**Innovation in Livelihood Adaptation:  
Examples from RESOLVE, Bangladesh**



## Innovation in Livelihood Adaptation: Examples from RESOLVE, Bangladesh

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*This is a 'Working Draft' and is meant to raise discussion and seek comments. Please do not quote.*

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## 1. INTRODUCTION:

Since the dawn of civilization, human has been adapting to environmental change for their survival. In the course of time, various technological and non-technological innovations have helped to shape and form current anthropocene. However, much has been loss to reach the current state, particularly causing irreversible modifications in the nature. Consequently, humanity has been facing revenge of nature in the form of increased frequency of natural disasters. For many no alternative remains unless adapting to this climate change. Therefore, both the policy makers and academics are recognizing climate change as the most significant environmental, economic and security threat that humanity facing.

Continuous search and research is going on developing and promoting innovative ways to respond to climate change. However, poor communities of developing countries mostly rely on traditional knowledge to find adaptive solutions to climate change. This is partly due to inaccessibility to advanced technological solutions and largely their time tested first-hand accumulated knowledge that they have gained over time with adapting to environmental change. Now there is a need for information on specific examples or case studies illustrating how these innovations can be implemented in the real world. This report purports to do just that by highlighting some specific examples of how innovation is being implemented, focusing climate affected villages of Bangladesh.

Innovation is to take advantages of new ideas leading to the creation of a new method, idea, product, service, etc. By definition, all innovation must contain a degree of novelty. However, it is not just the invention of a new idea, but covert idea into practice and developing comprehensive methodology to achieve certain goals. The Oslo Manual distinguishes three types of novelty: an innovation can be new to the firm, new to the market or new to the world. The first concept covers the diffusion of an existing innovation to a firm – the innovation may have already been implemented by other firms, but it is new to the firm. Innovations are new to the market when the firm is the first to introduce the innovation on its market. An innovation is new to the world when the firm is the first to introduce the innovation for all markets and industries (OECD and Eurostat, 2005). This paper will present three innovative livelihood practices of rural Bangladesh, which may not be totally new practice but reformulated to adjust with local context.

## 2. INNOVATION IN ADAPTATION:

Innovation can occur in any sector of the economy and society, including government services such as health or education or social services such as disaster volunteering. In case of innovation in adaptation, innovation means different activities practicing by the human to make the world safe, from present and upcoming shocks and surprises, particularly climatic shocks. Being one of the worst victim of climate change, Bangladesh's development has been repeatedly obstructed by floods, riverbank erosion, drought, salinity, cyclone, cold wave etc. Agricultural productions are

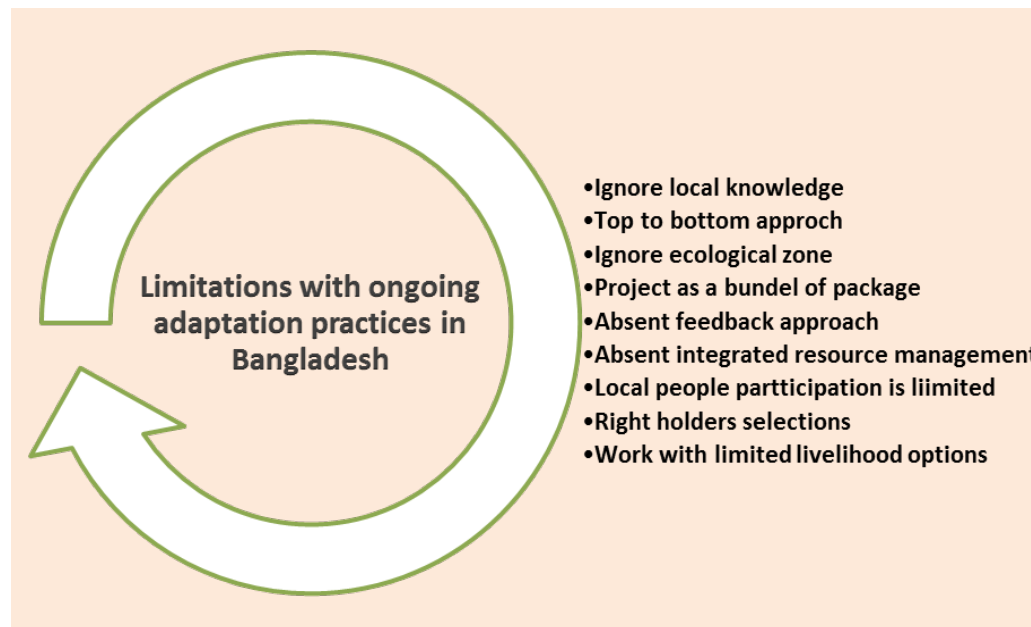
being hampered differently for different climate change impacts and causing food insecurity for the poor. Innovation is thus essential if countries and communities are to recover from the climatic shocks.

Agriculture is one of the most affected sectors from climate change, where both direct and indirect loss incurred. Direct loss mainly occurs when different natural hazards destroy agriculture production and indirect loss is related to reduced production due to changing different parameters of climate like rainfall, temperature etc. Introducing innovative climate resilient practices for promoting sustainable agricultural and secured livelihood is very much essential for the people who are more vulnerable from climate change. With the aim of making rural communities more resilient towards adverse impacts of climate change and increase food security the RESOLVE (Regenerative Agriculture and Sustainable Livelihoods for Vulnerable Ecosystems) is being implemented in the Northern, Central and South-central part of Bangladesh. The project is different from other conventional adaptation projects where innovation is targeted and maintained in design, management and implementation.

### 2.1 Innovation in the RESOLVE

Despite proliferation of adaptation related projects in Bangladesh, most of them are failed to produce significant effect in the lives and livelihood of the affected communities. While evaluating the conventional adaptation projects, this paper has identified a number of reasons that limits affected communities' endeavour to way out from poverty trap. Climate change has been exerting extra burden to already threatened communities and compounding their vulnerability and creating a low level equilibrium situation where people find themselves trapped in a cycle which they termed as their fate. Unfortunately most of the donor dominated adaptation projects apply imported approaches which are failed to address local people's demand or do not match with local ecological condition that eventually fail to results in comprehensive adaptation.

**Figure 1: Limitations of the ongoing adaptation projects**



At the designing phase, RESOLVE has critically analysed the shortcomings of other existing adaptation projects and tried to address those in various steps ranging from design to management and implementation.

There are many types of advantages with RESOLVE project to make communities more resilient with climate change adaptation. For this RESOLVE takes different types of techniques to address different kinds of limitations with others adaptations programmes. Following are different types of limitations identified by RESOLVE to address it with RESOLVE adaptations techniques to make households and communities resilient with climate change adaptations

**Table 1: How RESOLVE addresses different limitations of adaptation practices**

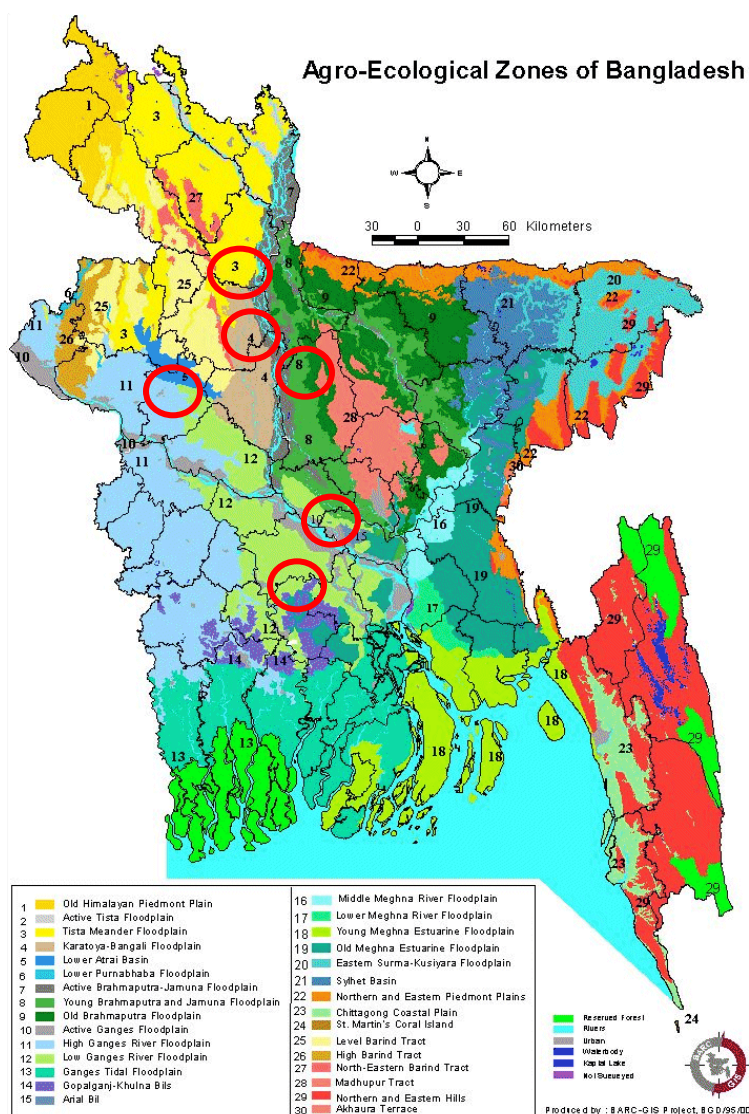
<b>Limitation with other adaptations programme</b>	<b>Effect of the Activity under RESOLVE</b>	<b>Novelty under RESOLVE</b>
<b>Ignore local knowledge</b>	People could not actively participate with different activities	Thorough consultation with local people and document available knowledge
<b>Top-Down approach</b>	Target people are considered as beneficiary and peoples demand does not reflected in the interventions properly	Bottom- Up approach
<b>Ignoring Characteristics of Agro-ecological zone</b>	The activities do not consider characteristics of agro-ecological zone	Different adaptations techniques practicing in different agro-ecological zone
<b>Project as a bundle of package</b>	Failed to prioritize	Different components are designed for different livelihood options
<b>Absence of feedback mechanisms</b>	Failed to address target communities demand and evaluate progress	Collect data every month on the state of livelihood
<b>Limited participation of local people</b>	Local people's demand and voice ignored that fail to produce sustainable outcome	All steps of the project including implementation carried in a participatory way
		Diversified livelihood
		Adaptive management
		Community people play central role in demand articulation and project implementation

RESOLVE identifies the target groups as Right holders based on the understanding that they are poor and vulnerable because of global climate change where their contribution is absent, but their right to growth is at stake due to climate change. Using GIS technology, the right holders location is pointed and a map was produced which could serve as justification for their selection. Moreover, all the interventions under RESOLVE were designed with thorough consultation with right holders where their demands were prioritized.

### 2.1.1 Innovation in Programme Design:

Much has been talked and studied about coastal vulnerability to climate change in Bangladesh. This is obvious that coastal region of Bangladesh is already experiencing bad impacts of climate change and will be the worst affected in future. However, other regions, mainly the northern, central and south central part of Bangladesh is also vulnerable to climate change differently, even though no such systematic study or adaptation practices so far been introduced or practiced.

**Figure 2: RESOLVE area based on agro-ecological zone**

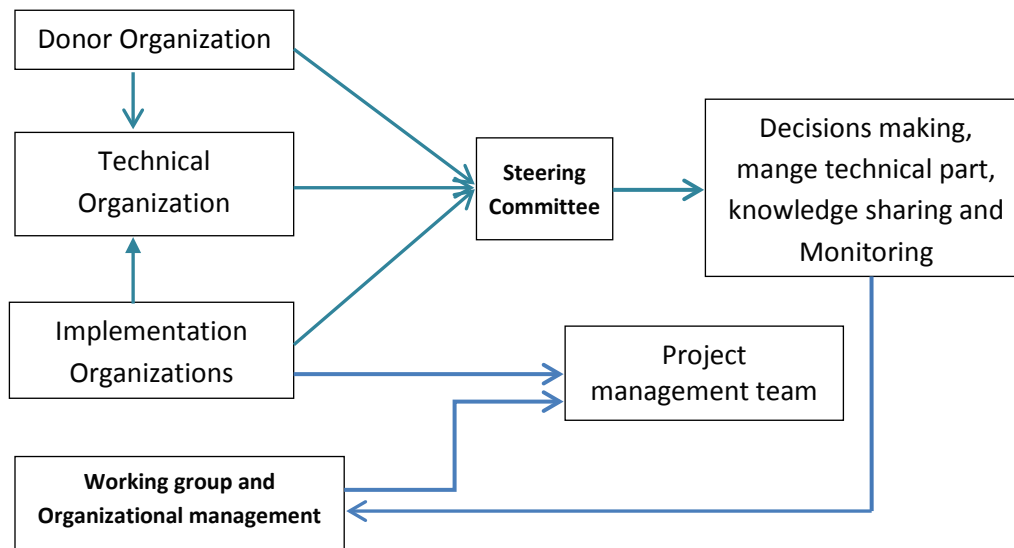


These regions produce a major share of country’s agriculture production but affected by recurring floods, river bank erosion, heat wave, cold wave and some sorts of salinization. The floodplain dominated landscapes is formed in the GMB basin where Gaibandha at the Bhammaputra basin, Sirajgonj is situated at the Bhammaputra-Jamuna basin, and Shariatpur at Ganges-Meghna basin. The RESOLVE, therefore, has purposively selected agro-ecological zone 2, 4, 7, 10, 12 based on agriculture practice and difference in vulnerability to climate change (Figure 1), where AEZ 2,7 are vulnerable to drought, flood and river bank erosion, AEZ 4,7 and 11 are vulnerable to flood and river bank erosion and AEZ 10, 12 are vulnerable to flood and salinization. Depending on different vulnerability factors, the RESOLVE has designed different adaptation practices for different AEZs.

### 2.1.2 Innovation in Management:

The management structure of RESOLVE is divided into two parts; Steering committee and Working group. The steering committee is formed with executive director or designated person from each partner organizations, who mainly deals with programme design decision-making, knowledge sharing and monitoring and evaluation of the project. On the other hand, the working group is responsible for implementing the project at field level, which is formed with project managers and project officers from each organization.

**Figure 3: Management structure of RESOLVE**



Unlike other projects, RESOLVE has established strong feedback loop to nurture and mainstream innovation. RESOLVE has been maintaining log-in-diary and arranging monthly working group meeting to share and review implementation status of the project as well as scooping innovative ways of implementation. Moreover, RESOLVE has introduce state of livelihood where data has been collecting from every right holders under certain categories on monthly basis to know the response of the interventions and accordingly adjust the activities based on evolved needs.



In addition, RESOLVE has formed a ‘concerned community people forum’ by involving peoples from different level (Local government, officials from government line departments, journalists, villagers) for monitoring, sharing and caring of ideas, activities and achievements both at implementation and learning level

### **3. INNOVATIONS AT RESOLVE FIELD:**

Sustainable management of land and water resources for intensification of agriculture and poverty reduction in many developing regions has remained one of the most challenging policy issues for a long time. Due to climate change the agro-ecosystems have been degrading more abruptly than before that gradually deprives the poor of key productive resources and affects communities whose livelihoods heavily rely on utilization of these resources. Degradation of land and water resources gradually diminishes the capacity of individual farmers and communities to undertake critical investments needed to reverse the situation. This in turn reduces opportunities for addressing nutritional and other necessities and depletes the ability to buffer shocks, thereby increasing vulnerability of livelihoods (Shiferaw and Bantilan, 2004).

Taking into account the observed and potential impacts of climate change on agriculture and resultant food insecurity, the RESOLVE has introduced three innovative agriculture practices for three different regions. The interventions were designed based on local agro-climatic factors targeting specific needs of specified groups of people. For instance, in Gaibandha, a water scarce area, Integrated Fish-Duck- Vegetable introduced to optimize water use and increased protein and vegetable supply for the poor communities using their tiny land who otherwise unable to afford their minimum nutritional requirement.; In Siragonj RESOLVE has introduced Compartmental Homestead Poultry to increase protein supply for the communities of Remote Island who usually take protein rarely once in a month and suffer from acute malnutrition; In Shariatpur, Hanging vegetable was introduced as most of area in the project village remain under water for whole rainy season. Moreover, increased salinization limits opportunity of land based agriculture in the area.

#### **3.1 Integrated Fish-Duck -Vegetable Cultivation (Gaibandha)**

The RESOLVE has targeted to transform landless or small holders farmers of Gaibandha into dual economic agents engaging simultaneously in the production and consumption of the same commodities and investments in improving productivity and sustainability of natural resources. Hence, smallholder farmers could be referred as farm-households. Right holders at Gaibandha are characterized by small land ownerships or no lands, mostly engaged in sharecropping.

With the aim of increasing income within limited homestead area, Integrated Fish-Duck-Vegetable cultivation introduced in Gaibandha where a 15 feet long and 7 feet wide pond developed for fish cultivation, the whole pond was covered with small net to protect the small fish from duck, at the dyke of pond seasonal vegetables were grown. The water for pond comes from a tube-well through a pipe, where women can supply water easily by hand pumping only half an hour every day in dry season; in rainy season the pond receives pond from rain. Another advantage of watering everyday by tube-well is it helps mixing oxygen in water that is essential for fish growth.

Masuda Begum, one of the right holders of RESOLVE project, started practicing Integrated Fish-Duck-Vegetable cultivation since February 2011 on her 2 decimal home-yard. Her husband Mominul is a sharecropper and struggling to manage food for his six member family. Last year, due to flood he lost significant amount of yield and after sharing rest of the yield with landowner he failed to feed his family three times in a day. He had to work a day labourer, but could not able to manage a work for whole rainy season. Masuda Begum was helpless and did not find any options to contribute her family in those bad days. Under the circumstances, with the technical and logistic support from RESOLVE she started Integrated Fish-Duck- Vegetable cultivation in her home yard. Now she is producing different vegetables, and after fulfilling her family demand she sells additional amount and earn 600 Bangladeshi taka each month. Moreover, she sells duck and egg which supplement her income. Her 6 year old son started going school. She is planning to sell fish from her tiny pond this year. Her family now takes fish four times in a week from her own pond, where last year they were able to consume fish once in every month occasionally.

**Figure 4: Integrated Fish-Duck-Vegetable Cultivation by Masuda Begum at Gaibandha**

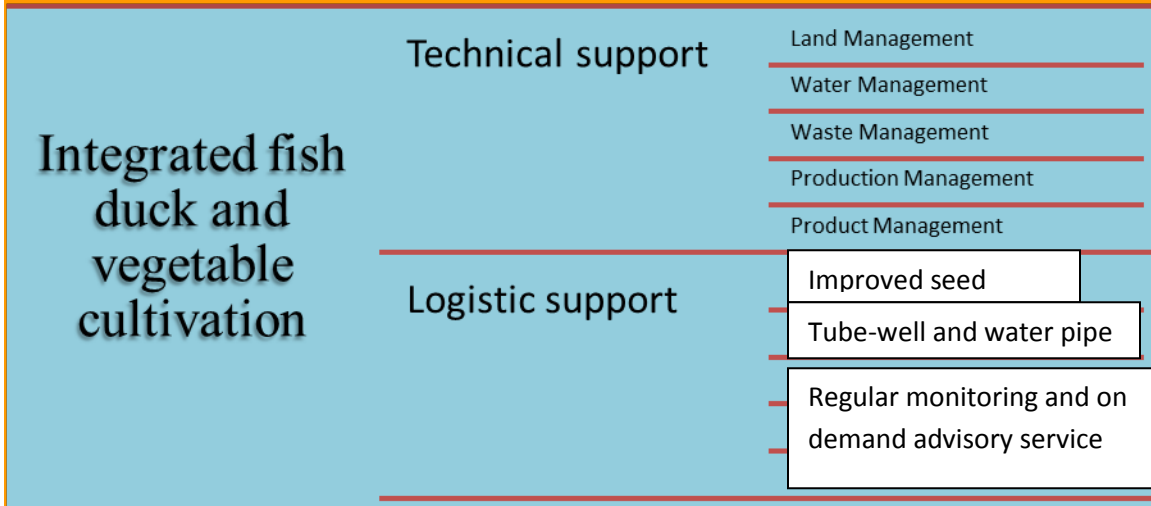


Along with training on different components such as fish culture, duck rearing and vegetable production, RESOLVE has been providing right holders with quality seeds, improved variety of duck and fish seeds. Moreover, a tubewell has been provided and erected which serves drinking water and water for fish culture in dry season.

In addition, RESOLVE is providing all kinds of technical supports such as how to use land properly, how to manage water, how to produce organic fertilizer by managing different kinds of wastes and how to market additional products to. It seems right holders' income has increased by

practicing Integrated Fish-Duck and Vegetable along with increasing nutritious food consumption which implies that they are more resilient to climate change in case of livelihood options.

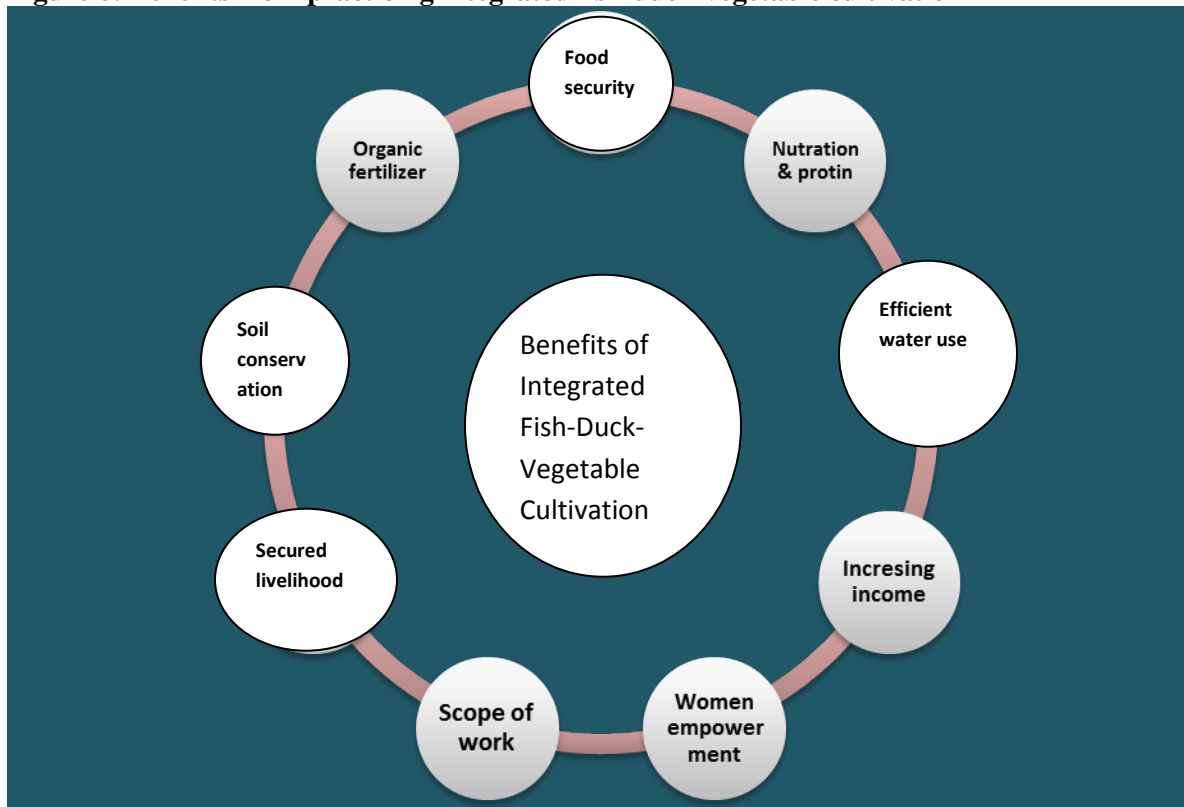
**Figure 5: Different types of support provided by RESOLVE for Integrated Fish-Duck-Vegetable Cultivation**



### 3.1.1 Benefits from Integrated Fish- Duck -Vegetable Cultivation:

Integrated Fish-Duck-Vegetable cultivation provides multiple products such as vegetables, fish, duck and as by product organic fertilizer and contribute to ensure household food security, particularly in the lean season. The practitioners are receiving extra income from selling additional produce after their consumption. Another important outcome of the practice is women empowerment. This practice is easily manageable by women in their homesteads. Through this practice women can utilize their available time and ensure households food security and contribute to family income by selling additional amount of produces. Women’s earning entity makes them decision making body in their family affairs as well as social issues.

**Figure 6: Benefits from practicing integrated fish-duck-vegetable cultivation**



### 3.2 Compartmental Poultry at Homestead Area (Sirajganj)

Most of the right holders under RESOLVE are living in remote river island of Sirajganj who are landless poor, small and marginal landowner and about 75 percent of them are engaged in agriculture either as wage labourer or sharecropper. However, most of them are struggling to fulfill their household's food and other basic demands. Moreover, due to climate change their survival becomes harder.

As most of the households are poor and marginal farmer, in case of any climatic impacts they lose their limited livelihood options and fall into deeper vulnerability. Being located in remote river island, those people remain detached from mainland for the whole rainy season. In that time, they have to rely on their own production for survival. Moreover, their income opportunity reduces drastically. To address the challenges and also to find a sustainable solution, RESOLVE has introduced compartmental poultry in Island of Sirajganj.

Poultry rearing is a traditional practice at households in rural Bangladesh. Mostly, women are engaged with the activity besides other household activities. Here RESOLVE slightly modified the traditional practice by introducing compartmental poultry cage. In each cage there would be four compartments, where in one compartment the mother poultry stays. They are transferred to another chamber when they started hatching eggs. As soon as they complete hatching, they again return to their original compartment and the eggs are used for consuming or selling. Some of the eggs are stored for breeding in another compartment. Through this separation of mother poultry from egg they become started hatching egg within short time than the normal interval period. A

poultry cage occupies very small amount of area, even can be managed within household. Moreover, using this technique the household can easily increase their income three times that traditional chick rearing.

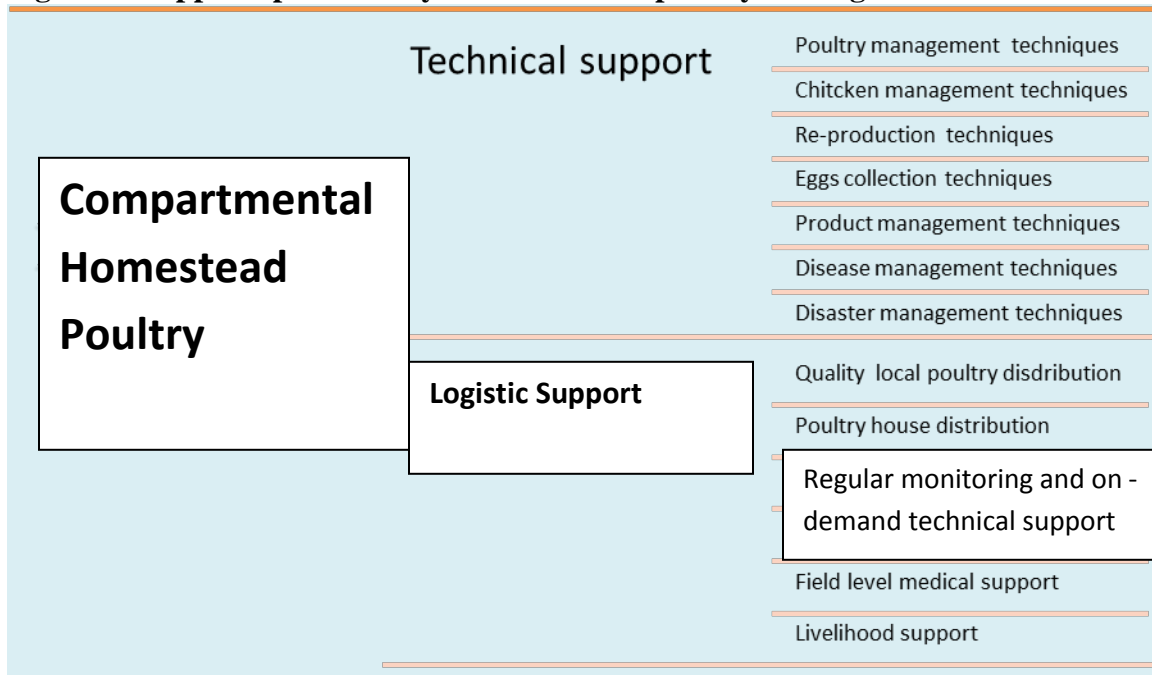
Ahela Begum, aged 45, wife of Mr Mozamfokir. Mozamfokir who is agriculture wage labor. Mr. Mozamfokir cannot manage three times food for his six member family. Aleha begum is trying to support her family as a part time wage labourer.

Ahela begum received Compartmental Homestead Poultry rearing techniques under RESOLVE project along with a poultry cage and 10 mother poultry. Now she has total 24 poultry. In the meantime, she has already sold four poultry @ 200 taka and bought medicine and some other household needs. From her opinion, now she is well-off than before and sending her 6 year daughter to school, and wishing that her daughter will be a school teacher.

**Figure 8: Ahela Begum and her compartmental homestead poultry firm, Khasrajbari, Sirajgonj**



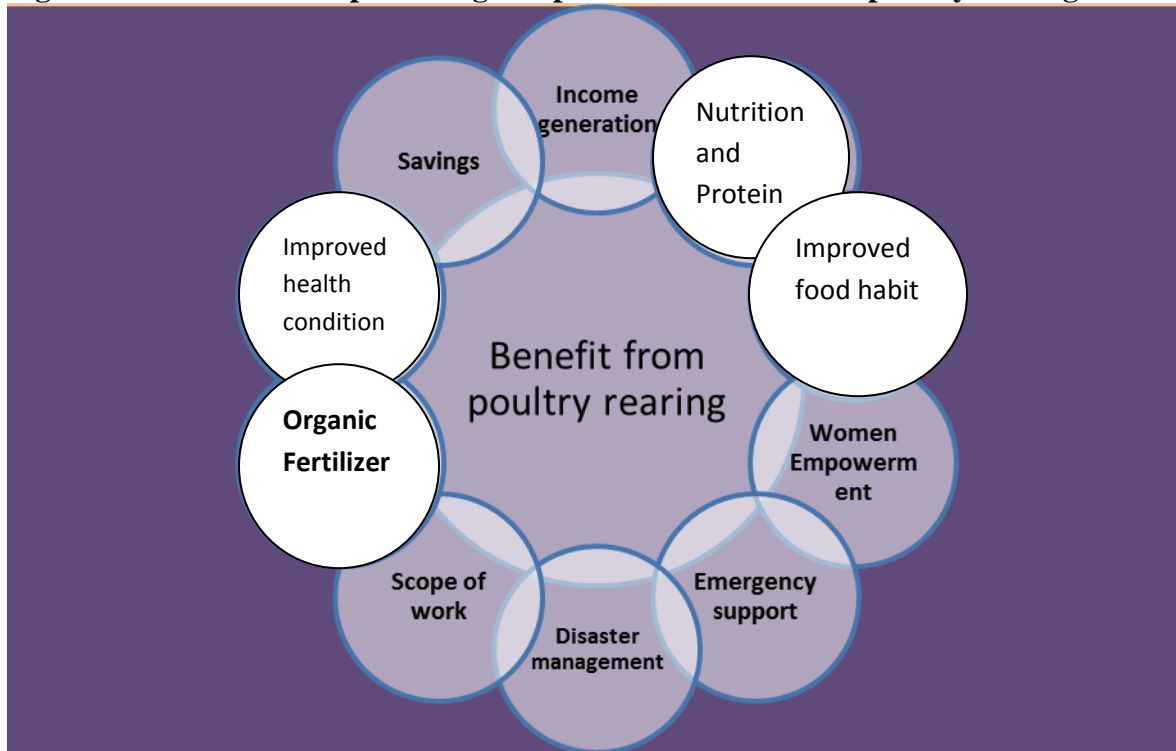
**Figure 9: Supports provided by RESOLVE for poultry rearing**



### 3.2.1 Benefits arising from practicing Compartmental Homestead Poultry:

Poultry rearing and homestead gardening are playing important role in alleviating poverty in remote river Island of Sirajgonj by creating better livelihood options. RESOLVE has also used the same tools in Sirajgonj but with some modifications. From field observation it is found that income of those women headed families that are practicing Compartmental Homestead Poultry has increased by selling poultry, eggs and vegetables from their homestead area. Moreover, households' nutrition and calories intake capacity is increasing day by day. Women who are practicing this adaptation are more empowered then before, they voice are given value both at household decision making process and community issues. They have the options of income, savings and scope of work for sustainable livelihoods development. In case of any kinds of disaster, now they are more capable to manage their emergency support.

**Figure 10: Benefits from practicing compartmental homestead poultry rearing:**



### 3.3 Hanging Vegetable Cultivation (Shariatpur)

Along with seasonal flood and water logging, salinity has become a major threat for agriculture in Gosairhat upazila of Shariatpur district. Most of the farmers of this area can not cultivate their land in the rainy season for water logging. In response to the water logging and salinity problem, RESOLVE has introduced Hanging Vegetable cultivation in Gosairhat upazila. In this agriculture practice a raised bamboo platform prepared with three sticks placed at 45 degree to each other and the intersection tied with jute rope. Then an earthen pot of 3 cubic feet set on the bamboo platform and filled with surface soil collected from non-water logged area. Organic fertilizers applied in the soil before 3 days of planting and also need water in alternate days in first three weeks depending on seasonality. In this system, both seasonal and perennial vegetable can be grown.

For hanging vegetable cultivation, RESOLVE is providing different kinds of technical and logistic supports; such as training on raised platform preparation, earthen pot preparation, soil selection, organic fertilizer preparation, land preparation and also supply quality seeds. Moreover, a technical expert visits field every days and provide with on-demand technical assistance.

**Figure 11: Different type of supports provided by RESOLVE project for Hanging Vegetable Cultivation**

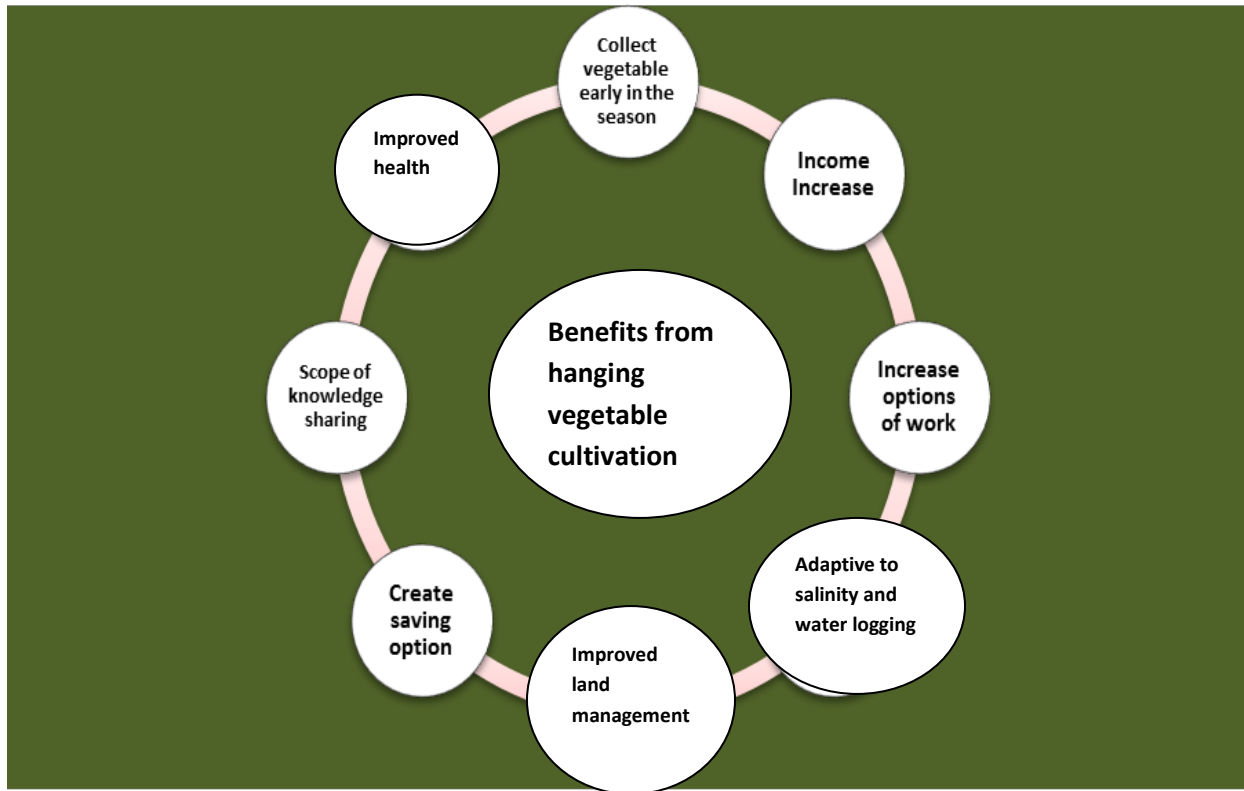


### **3.3.1 Benefits of practicing Hanging Vegetable cultivation:**

Hanging vegetable cultivation provides early production; therefore more than one crop can be grown in the same amount of land. Moreover, it provides a solution for salinity and water logging otherwise the people has to starve or migrate. This practice creates new window in agriculture practice where the farmers without having a single piece of land can grow vegetables in their yard or even in roadside. The raw materials for this agriculture such as soil, mulching are available free of cost, therefore poor farmer can easily practice it without having any financial involvement unless physical labour, but the return is high.



**Figure 11: Benefits of practicing Hanging Vegetable**



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- **Impacts of Changing Climatic Condition and Increasing Population on Food Security in South Asia: Based on Different Scenarios**
- **Accounting Climate Induced Migration in Bangladesh: An Exploratory GIS Based Study**
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