Social Assessment and Social Management Framework
Agricultural Research and Technology Support (ARTS) Project, Bangladesh

The Ministry of Agriculture
Government of Bangladesh

January 2013
Abbreviations and Glossaries

- **Aman**: Crop season, usually August to December
- **ADP/RADP**: Annual Development Programme/Revised Annual Development Programme
- **AI**: Artificial Insemination
- **ARAP**: Abbreviated Resettlement Action Plan
- **ARIs**: Agriculture Research Institutes (BARI, BRRI, BFRI etc)
- **ARTS**: Agricultural Research and Technology Support
- **Aus**: Crop season, usually April to July
- **B. Aman**: Broadcast Aman
- **BADC**: Bangladesh Agriculture Development Corporation
- **Bagda**: Shrimp
- **Bangalee**: A cultural identity of people speaking Bengali
- **Bangla**: Bengali
- **Baor**: Oxbow lake
- **BARC**: Bangladesh Agriculture Research Council
- **BARI**: Bangladesh Agriculture Research Institute
- **BBS**: Bangladesh Bureau of Statistics
- **Beel**: Floodplains
- **BFRI**: Bangladesh Fisheries Research Institute
- **Bigha**: One third of an acre
- **BINA**: Bangladesh Institute for Nuclear Agriculture
- **BLRI**: Bangladesh Livestock Research Institute
- **Boro**: Crop season, usually January to April/May
- **BRRI**: Bangladesh Rice Research Institute
- **CBO**: Community Based Organization
- **CEAL**: Community Extension Agent in Livestock
- **CGP**: Competitive Grants Programme
- **Chasi/krishok**: Farmer
- **CIG**: Common Interest Group
- **CSO**: Civil Society Organization
- **DAE**: Department of Agriculture Extension
- **DC**: Deputy Commissioner, Head of district bureaucracy
- **DLS**: Department of Livestock Services
- **DoF**: Department of Fisheries
- **DPIC**: District Project Implementation Committee
- **DTW**: Deep Tube Well (used mainly for irrigation)
- **EMP**: Environmental Management Plan
- **EOP**: End of Project
- **ERD**: Economic Relations Division (of the Ministry of Finance)
- **ESMF**: Environmental and Social Management Framework
- **FAO**: Food and Agriculture Organization
- **FFS**: Farmer Field School (an extension method applied in a DANIDA funded project)
- **FGD**: Focus Group Discussion
- **FIAC**: Farmers’ Information and Advice Centre (at UP level promoted by the NATP)
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>FMD</td>
<td>Foot and Mouth Disease of Cattle</td>
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<td>GAF</td>
<td>Gender Assessment Framework</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GO</td>
<td>Government Organization</td>
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<td>GoB</td>
<td>Government of Bangladesh</td>
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<td>Golda</td>
<td>Prawn</td>
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<td>Ha</td>
<td>Hectare</td>
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<td>Haor</td>
<td>Low lying flooded area of Northeast Bangladesh</td>
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<td>HCR</td>
<td>Head Count Ratio</td>
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<td>HH</td>
<td>Household</td>
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<td>HIES</td>
<td>Household Income and Expenditure Survey</td>
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<td>HYV</td>
<td>High Yielding Variety (usually of crops)</td>
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<td>ICM</td>
<td>Integrated Crop Management – later phase of IPM</td>
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<td>IMED</td>
<td>Implementation Monitoring and Evaluation Division (Ministry of Planning)</td>
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<td>IPM</td>
<td>Integrated Pest Management - engaged in killing insects without insecticides</td>
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<tr>
<td>Jolmohal</td>
<td>Public water bodies</td>
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<td>Khas land</td>
<td>Public land, land owned by the government</td>
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<td>Kutch</td>
<td>Mud wall or mud floor house</td>
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<td>LAP</td>
<td>Land Acquisition Proposal</td>
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<td>LEAF</td>
<td>Local Extension Agent in Fisheries</td>
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<td>LGB</td>
<td>Local Government Body</td>
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<td>LGED</td>
<td>Local Government Engineering Department</td>
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<td>LLP</td>
<td>Low Lift Pump (used mainly for irrigation)</td>
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<td>M&amp;E</td>
<td>Monitoring and Evaluation</td>
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<td>MDG</td>
<td>Millennium Development Goal</td>
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<td>MFI</td>
<td>Micro-Finance Institute</td>
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<td>ML</td>
<td>Medium and Large (farm)</td>
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<td>MOA</td>
<td>Ministry of Agriculture</td>
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<td>MoFL</td>
<td>Ministry of Fisheries and Livestock</td>
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<td>Mouza</td>
<td>A village map prepared by the officials of the land revenue administration</td>
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<td>MT</td>
<td>Metric Ton</td>
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<td>NARS</td>
<td>National Agricultural Research System (Coordinated by the BARC)</td>
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<td>NATP</td>
<td>National Agricultural Technology Project</td>
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<td>NGO</td>
<td>Non Government Organization</td>
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<td>NPD/PCD</td>
<td>National Project Director/ Project Coordinating Director</td>
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<td>O&amp;M</td>
<td>Operation and Maintenance</td>
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<td>OP</td>
<td>Operational Policy</td>
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<td>PAP</td>
<td>Project Affected Person</td>
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<td>Paurasova</td>
<td>Municipal Council/ Urban Local Government Unit</td>
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<td>PD</td>
<td>Project Director</td>
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<td>PMU</td>
<td>Project Monitoring Unit</td>
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<td>PO</td>
<td>Producer Organization</td>
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<td>PRA</td>
<td>Participatory Rural Appraisal</td>
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<td>PRSP</td>
<td>Poverty Reduction Strategy Paper</td>
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<td>Acronym</td>
<td>Description</td>
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<tr>
<td>PSC</td>
<td>Project Steering Committee</td>
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<td>Pucca</td>
<td>Brick Cement construction</td>
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<td>RAP</td>
<td>Resettlement Action Plan</td>
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<td>SA</td>
<td>Social Assessment</td>
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<td>SCD</td>
<td>Supply Chain Development</td>
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<td>SCDC</td>
<td>Supply Chain Development Component</td>
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<td>SHG</td>
<td>Self Help Group</td>
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<td>SIA</td>
<td>Social Impact Assessment</td>
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<td>SMF</td>
<td>Social Management Framework</td>
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<td>SMF</td>
<td>Small and Marginal (farm)</td>
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<td>SPGR</td>
<td>Sponsored Public Goods Research</td>
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<td>SRDI</td>
<td>Soil Resources Development Institute</td>
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<tr>
<td>STW</td>
<td>Shallow Tube Well (used mainly for irrigation)</td>
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<td>T. Aman</td>
<td>Transplant Aman</td>
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<td>TPDP</td>
<td>Tribal People’s Development Plan</td>
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<td>TPMF</td>
<td>Tribal People’s Management Framework</td>
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<tr>
<td>UP</td>
<td>Union Parishad, Grassroots local government council</td>
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<td>UNO</td>
<td>Upazila Nirbahi (Executive) Officer, Head of Sub district bureaucracy</td>
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<tr>
<td>Upazila/UZ</td>
<td>Sub district – lowest administrative unit, second tier of rural local government</td>
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<td>WB</td>
<td>World Bank</td>
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<td>WFP</td>
<td>World Food Programme</td>
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Executive Summary

I. Social Assessment

1. Introduction

Background
This report has been prepared for the Bangladesh Agricultural Technology Support (ARTS) Project to be implemented in six ecologically constrained and socially disadvantaged districts of Bangladesh. The project is funded by a grant from the USAID and administered by the World Bank. The project is framed with the experience of the National Agricultural Technology Project. It will extend and deepen the best practices of the NATP to new areas and will be implemented by using the existing organizational setup of the NATP belonging to two administrative ministries, the Ministry of Agriculture and the Ministry of Fisheries and Livestock. The Government of Bangladesh undertook this Social Assessment and Social Management Framework of the ARTS project with the assistance of the World Bank. The World Bank Office, Dhaka engaged two consultants to carry out Environmental and Social Management Framework under which this report is prepared as Social Management Framework.

ProjectObjective and Components
Overall objective of the ARTS project is to improve agricultural productivity and income of farmers through supporting research into appropriate technology, increased adoption of low-risk and highly rewarding in marginalized areas and fostering farmers linkage to market. The ARTS project comprises four components- agriculture research support, technology adoption, supply chain development and project support and coordination unit.

The research component comprises two sub projects, the competitive grants programme (CGP) to support short to term adaptive research and the sponsored public goods research (SPGR) to support more strategic and cross-cutting research and enhancing efficiency and effectiveness of the National Agricultural Research System (NARS).

The technology adoption component will establish a decentralized and demand-driven extension service that is knowledge intensive and accountable to farmers, particularly the small and marginal farmers. It will emphasize further scaling up of best practices emerging from the National Agricultural Technology Project (NATP) and increasing the adoption of low-risk/ high-rewarding in underserved remote areas through (i) mobilization of CIGs; (ii) decentralized extension service; and enhancing efficiency of national institutions involved in agricultural extension.

The supply chain development component aims to increase and diversify sources of income for small and marginal farmers by identifying local, national and international markets for producers and facilitating the services that will help them access those markets on competitive footing.

Socio-Economic Profile of the ARTS districts and the country
The six ARTS districts have total population of about 9.287 million living in 10,618 sq kms area with population density of 875, a bit lower density than country average 1,015. Sirajganj and Madaripur
have higher than national average density and other districts have lower density. Sex ratio is near unity for the country and in Sirajganj district and in other districts women outnumbered men with varying sex ratio of 94 to 95 percent. Average household size varied from 4.3 to 4.8 compared to country average of 4.4.

Both study districts and the country has about 90% Muslim population and about 10% Hindu and other minority population. The ARTS area as a whole has 0.22 percent tribal population compared to 1.1% of the country as a whole as per Statistical Yearbook 2011 (based on population census 2001) but the community series data of the same census shows very few tribal households in each district and that too so dispersed that finding a tribal community of even ten households is rare in the ARTS area.

Thirty one point five percent of Bangladesh people lived below poverty line in 2010 compared to 40.0% in 2005 with substantial rural urban difference, 43.8% of the rural people were poor in 2005 and 35.5% in 2010. Percentage of people in poverty decreased substantially in the last decade and over the last five years it decreased faster in the high poverty areas like Barisal, Khulna, Rajshahi and Khulna divisions than in the low poverty area- Dhaka division but the Barisal and Rajshahi divisions, where two of the six ARTS districts are located (Bhola and Sirajganj) are still poorer than the country average. The other four southern districts also, although part of Dhaka and Khulna divisions (Madaripur, Shariatpur, Gopalganj and Magura) are ecologically stressed and have constraints to faster development for the absence of Padma bridge.

Profile of the Agriculture Sector
Although the share of agriculture is decreasing over the decades, it still accounts for over one fifth of the GDP (20.3% in 2009-10) as reported in the Statistical Yearbook of Bangladesh 2011 pp 386). Crops, livestock, forestry and fisheries sub sectors contributed 11.4, 2.7, 1.7 and 4.5 percent respectively. Over the last five years, the agriculture sector grew at 4 to 5 percent yearly except in 2007-08 which was a bad year for flood and cyclone.

Crop sub sector: The country has a total of 13.5 million landless non-farm holdings and 15.2 million farm holdings which are 47 and 53 percent of all holdings. As proportion of farm holding, 85% of the farms are small and marginal and 15% are medium to large farms.

Ninety five percent farms are operated by men in the country as compared to 98% in the ARTS districts. Women are however largely involved in post-harvest work and various other farming activities as household labour as well as wage labour in the recent times. About 56% of the farm households are owner operators in the ARTS districts and most others are owner cum tenants (40%) and only about 4% are tenant farmers. Of the total farm area, about 90% is cultivated by owners and 10% by tenants. Most (90-95%) households own at least homestead area and average homestead area is 0.08 to 0.12 acres. Therefore homestead agriculture is a good area to intervene particularly to reach the landless and women farmers.

Bhola, Sirajganj and Magura districts have high proportion of high and medium land while Madaripur, Shariatpur and Gopalganj have higher proportion of medium low to very low land. Gopalganj, Madaripur and Shariatpur are more flood-prone and have water-logging problem. Bhola and Gopalganj are also vulnerable to salinity and cyclone while Sirajganj, Madaripur, Shariatpur and Gopalganj are vulnerable to river flood. Magura has higher
drought vulnerability. Cropping intensity vary from 176 to 235 percent, lowest in Gopalganj and highest in Bhola. Average of the ARTS district is 208 compared to 185 of the country.

The six ARTS districts together produced 2.2 million metric tons cereals in 2008-09 in total crop area of 861,234 ha with average yield of 2.6 MT/ha. In terms of area HYV Boro ranks first followed by Aman HYV and Aman Local. Aus area is currently low but has potential. The study area is behind national average in terms of yield of cereal crops, 2.6 MT/ha compared to 2.8 MT/ha. Local potato is a major crop only in Sirajganj district while HYV potato is important in Sirajganj and Bhola. Jute is important in all districts except Bhola. For both crops (potato and jute) yield is nearly equal in the ARTS area and the country.

The livestock sub-sector’s contribution to the national GDP is 2.7% as of 2009-10. The sub-sector grew at 3.4% in 2009-10. This sector has good potential as the farms can be located on small pieces of land and it can be managed by the small and marginal farmers and also by the women farmers on the homestead area. Particularly the poultry and dairy have bright prospect because of higher income elasticity of the produces (meat, eggs, milk and milk products). Local market of these products is quite large and is rapidly growing. In the ARTS districts 709,907 holders rear 1.7 million cattle, 15,517 holders have 43,039 buffaloes, 415,649 holders have 1.0 million goats and 29,239 holders have 91,772 sheep. In the six districts about 62% farm households have cattle, 1.3% has buffaloes, 36% have goat and 2.5% have sheep. Each holder has average 2.5 cattle, 2.8 buffaloes, 2.6 goats and 3.1 sheep. About 91% households in the ARTS districts rear poultry and 52% rear duck in the backyard. Average poultry and duck holdings rear 7.3 and 5.8 poultry and duck respectively.

Until very recently, 100% eggs and poultry was produced in the backyard farms. This scenario is changed now-a-days and the bulk of the eggs as well as poultry meat come from the small scale layer and broiler farms respectively. Still, backyard poultry and duck rearing remained important particularly for providing cash income opportunity to the poor rural women.

Poultry farms are facing various problems now, particularly the scarcity and high price of feed, chick and other inputs. Duck rearing has potential in the beel and coastal areas where substantial part of the land remains under water for about six months. Goat has one advantage that very poor households can manage it but its productivity is rather low and often conflicts with another important sub-sector, horticulture. Closed culture of goat is yet to be proven for extension to the smallholders.

The fisheries sub sector experienced massive structural change over the past three decades. It experienced about 4.1% to 4.2% growth recently but the share to GDP decreased slightly from 5.4% of 2001-02 to 4.5 in 2009-10. Within fisheries sub sector, aquaculture is growing faster while the shares of both inland capture fisheries and marine fisheries sharply declined. Over the last two decades the share of inland capture fisheries declined from over 51% to 35.5% while the share of aquaculture more than doubled from 21% to about 47%. Share of marine fisheries also declined about 28% to 18%.
Among the ARTS districts river catch is highest in Bhola and beel (floodplain) catch highest in Gopanganj. Aquaculture appeared prominently in all ARTS districts and in all, the yield is low, from 1.0 MT/ha to 1.2 MT/ha compared to national average of 1.3 MT which is also very low. The concerned extension agency officials felt that yield can be increased to about 3.0 MT/ha. Bagda farming is found in Gopalganj only while Golda too is found mainly in Gopalganj. Aquaculture as a whole appeared prominently in three districts- Bhola, Gopalganj and Sirajganj.

Present condition of the agricultural extension systems
The extension agencies have varying institutional facilities and field presence in the ARTS districts. The DAE has Sub Assistant Agriculture Officers in the grassroots level, average three officers in each Union Parishad. In the UPs having newly constructed UP Complex, the DAE is provided an office room and in the NATP areas the project has established FIAC in the UP level. The DLS and DoF do not have any staff in the UP level. Hence they have engaged Local Extension Agent in Fisheries (LEAF) and Community Extension Agent in Livestock (CEAL) to provide extension service in the village level in the NATP area while the office is located everywhere in the Upazila level.

The DAE has established farmer groups throughout the country initially aiming to popularize organic methods of pest control called Integrated Pest Management through the IPM Clubs. The IPM Clubs are used to disseminate improved farming practices in the village level and to organize demonstration etc. In the districts with project support (like Danida), the DAE has widened the scope of IPM to ICM (Integrated Crop Management). CEAL and LEAF are now promoted by the NATP and is likely to be further expanded and fine-tuned under the ARTS. The field presence has improved such as in Sirajganj after establishing the ICM but the sustainability remains a concern after likely closing the project in June 2013.

The Stakeholder Groups
The ARTS involves a wide range of stakeholders. The main stakeholder in the primary level (Village community, UP) are the farmers, fishers, landless, women, community based organizations and local government bodies etc. In the secondary level (Upazila and district) the main stakeholders are Government Organizations, Upazila Parishad, bureaucracy, civil society organization, NGOs, seed company agents, fertilizer dealers etc. In the tertiary level the main stakeholders are national level GoB agencies, national NGOs, International NGOs, Universities, Research Organizations, Consultants and International Agencies etc.

2. Social Issues

General Issues
The project is unlikely to affect any social group adversely through any of its activities but several social issues must be considered to ensure that the project benefits accrue to the target people equitably and no social group is adversely affected. Several of the issues are of general nature and are relevant to all components while some others are more relevant to specific components. The general issues include:

a. Inequality
The country as well as the rural economy experienced considerable economic growth but it has been accompanied by increasing inequality over the decades. National gini-coefficient measuring inequality increased from 0.451 in 2000 to 0.467 in 2005. The Sixth Five Year
Plan acknowledged the problem of inequality and pledged to address it during the plan period 2011-15. Income inequality is however lower in the rural areas than in the urban areas because rural rich are not very rich and not many in number to distort income distribution pattern.

The traditional low intensive agriculture is less dependent on external inputs hence the poor and marginal farmers can benefit from it. Newer technology requiring higher use of chemical fertilizer, modern seeds and equipment requires higher investment and beyond the reach of the SM farmers and it helped benefiting the landowners and enterprising farmers more than the landless. The landless and land poor have also been benefited through increased wage rate and higher work opportunities. But those without active male labour force remained excluded to a great extent because many agricultural works outside of homestead area still employ mainly male labour rather than female labour and women get lower wage.

This is a social barrier and is changing now. Rapidly growing intermediate technology in farm mechanization is increasing employment of both male and female labour. Example is increased use of power tiller and irrigation pump employing male labour as driver and mechanics but the same engine used for threshing is employing female labour winnowing crops. Besides, the use of power tiller engine in husking machine reduced workload of women giving them opportunity to devote more time in childcare and various productive activities like poultry and other home based agriculture. So, there are instances that technology not necessarily displaces labour. It can benefit all, including landless and women, although not equitably.

Selection of technology is therefore very important. If hybrid and HYV have to be accepted, it must be ensured that farmers have access to public sector agencies like BADC for seed and other inputs at low cost and of good quality and timely delivery is ensured. The farmer groups like CIG and farmer organizations like the POs to be developed and promoted under the project must ensure that they include small and marginal farmers, woman farmers everywhere and tribal community farmers where applicable.

b. Inclusion of sharecropper and tenant farmers
Sharecropping has been a traditional mode of production in Bangladesh and it helped many of the landless and land-poor households to participate in farming. This opportunity is shrinking as more and more farmers started cultivating nearly the whole of the agricultural area, and virtually no farmers have excess land to lease out. Modernization creates incentive for the landowners to displace sharecroppers except for the absentee owners. Presently the absentee owners have to lease out or engage sharecroppers but this opportunity is availed only or mostly by the kin members of the same extended family rather than the landless farmers.

Although, sharecropping might be decreasing but opportunities for fixed-rent tenancy should be increasing because of growing number of absentee owners, not necessarily rich but have migrated to urban areas for employment. In a field work in the four villages of Sirajganj district in December 2012, it was found that about 20% of the farmers are sharecroppers, the remaining 80% mainly owner operator including about 20% owner cum tenants.
The issue here is that the tenant farmers may feel unimportant to join CIGs and accept new technology and the extension agencies may face difficulties to trace them hence such farmers not included in the CIGs. But such farmers do continue in farming cultivating land from the same or different owners over long period. The ARTS, following the policy of the NATP intends to form 80% of the CIGs with small and marginal farmers and this must include tenant farmers and sharecroppers.

c. Issues concerning Women
The main issue concerning women is enhancing and facilitating their participation and thus enabling them to have due share of the project benefits. The ARTS specially aims women’s empowerment and must target that about 20% of the group members in crop and fisheries CIGs and 30% in the livestock CIGs are women. The concerned implementing agencies, particularly the DAE, DLS and DoF will ensure that required number of groups organized exclusively of women members with further emphasis that such women members are taken from the small and marginal farm households and female-headed households.

It may happen that the women farmers have tiny little agricultural holdings but they are most likely to have considerable involvement in homestead agriculture such as fruits and vegetables farming, poultry and goat rearing, operating homestead pond and plant nurseries etc. Also they are likely to have large involvement in post harvest activities and seed preservation. It is therefore important to give priority to women while selecting participants for training and extension services in such activities.

d. Tribal people
Government of Bangladesh does not use the term indigenous people as the constitution of the country has no such provision. The recent (15th) amendment of the constitution termed them “small ethnic community”, and they are entitled to special attention as “backward section of the people”. In the population census, they are identified as “tribe”. The ARTS districts have very low concentration of ethnic minority and tribal peoples. Compared to 1.1% nationally, the ARTS districts have only 0.22% “ethnic minority”, highest 0.76% in Bhola and only about 0.04 to 0.20 percent in other ARTS districts. Concentration of “tribal people” shown in the Community Series Data (Census 2001) is much lower.

According to the Community Series data, there is just one UP (Matborer Char of Sibchar Upazila, Madaripur) with some concentration of Tribal households, 212 households at village Bakhukandi. Second highest concentration is 15 Tribal Households at village Purba Shreekoil of Shreekoil UP, Shreepur Upazila, district Magura. Nowhere else in the ARTS districts there is concentration of ten or more Tribal households in one village. In one UP of Belkuchi Upazila, ten tribal households live in one UP (Daulatpur) spread over four villages.

The tribal people, living in proximity and in cordial relation with the mainstream Bangalee community have integrated in to the Bangalee society, speaking Bangla and children educated in Bangla schools. In reality, there is no other option, how a tribal community of only about half a dozen households live in isolation from the mainstream community? Also, the Tribal households had a tendency to migrate to the urban areas and are more involved in salaried services than in agriculture.
The point here for the ARTS is that, the project should make attempt to identify in the districts like Bhola and Madaripur in what specific Upazila, UP and village there is some concentration of 20 or more farm households belonging to some tribes in a village or about 50 in a UP to be organized in CIGs. In the case of tribal communities, men and women farmers can be organized in mixed CIGs and for all sub sectors (crops, livestock, fisheries and horticulture). The extension agencies may provide support to the mixed CIGs but they should not be excluded for low concentration or difficulty to reach them. If needed, they may also be included in CIGs formed in the nearby mainstream communities in case only few tribal households are found in one village.

e. Elite-capture
The group approach has many advantages but at least one disadvantage, the risk of elite-capture of the group or the organization, the CIGs and POs in the case of the ARTS. It happens that the leadership in the group or organization is captured by the elite and whatever resources available are utilized to benefit them financially or politically. In the past, leadership was determined by economic and social status, age, education and people’s respect. Now it has worsened with the replacement of all these by politicization and bureaucratization. The extension agencies may not be able to act impartially and may have to compromise to the wish of those who can influence decision making. It is quite likely that the rich influential person will chair the CIG and PO and his sister in law or daughter in law will take the position of “women’s representative”.

Issues Relevant to Specific Components
In addition to the abovementioned general issues and concerns, each sub-component has specific issues which are described in this section.

Issues relevant to Research Component
The SPGR interventions under the research component need to be focussed to direct research in priority areas and specifically relevant to supporting farmers in the ATRS districts in the short term. The longer term research and institutional development of the NARS should better be addressed through the NATP and other resources.

a. Prioritization of research
The issue relevant here is prioritization of research themes and specific sub projects to be supported under the SPGR. The sub projects should be implementable in about one year so that the outcome can be utilized for supporting area-specific technology packages selected for the ARTS. The ARIs may insist to include activities like longer duration study programmes, and creation of facilities which could be very justified for longer term development but not appropriate to yield quick result. The support to SPGR may comprise limited number of research sub projects by a process of consultation with the extension agencies and other stakeholders to identify immediate needs of the farmers in the ATRS. The CGP sub component proposed to carry out 40 short term research which is in line with the allocation provided in the project concept note.

b. Affordability of the farmers: One more concern of research component is affordability of the technology by the smallholder farmers. One example of such technology is intensive and semi intensive shrimp farming which was never accepted by the small farmers. So is the case of hybrid cattle that could not increase meat and milk production mainly for the
farmers’ inability to feed properly and adequately. Cattle breeding showed better success in Sirajganj, as the district has improved traditional varieties of cattle and the farmers are accustomed to better feed the cows and calves. Hence interventions in feed and fodder production and improved management practice may deserve higher priority than breed development or varietal development at this stage and under a short duration project like the ARTS.

c. Conflict between sub sectors: One more concern research component is likely conflict between sub sectors. Higher emphasis on hybrid, expanding crop area and crop intensification by varieties and technologies aiming only yield increase may lead to increased use of chemical fertilizer, pesticides and insecticides that is detrimental to the conservation of fisheries resources, bio-diversity as well as to the aquaculture. The examples include residual effect and spillage of agrochemical on fisheries resources in particular. The remedy is higher emphasis in bio-fertilizer (which is coming up but quality of present supply is questioned) and IPM. Adaptive research in vermi-compost was suggested by the DAE officers in Sirajganj as a priority area.

d. Inadequate linkage between research and extension: Discussion in the field level revealed very low interaction between research and extension. Some researchers mentioned of yearly workshops held in the ARIs and at BARC and in that too very few extension officers attend. The extension officers however said that they are not always informed of what researches are going on. If the extension agencies ask for some laboratory tests, requests complied but such interactions are infrequent and inadequate. The extension agency officials highly emphasized the need for improving research extension linkage. One specific need identified was testing of soil from the farmers’ land to identify micronutrient deficiencies and recommending proper mix of fertilizer use. The DAE officers in Sirajganj specifically said that, the soil quality map prepared by the SRDI is too old and the findings are not relevant in the changed circumstance after two decades. Collaboration with the SRDI was strongly recommended.

Issues Relevant to Technology Adoption

a. Availability of quality inputs
The extension agencies will mainly provide training, technical advice and will organize demonstration in various technology packages suited in local conditions. But they will not be able and are not mandated to supply inputs like quality seeds, poultry and duck chicks, fish fry, fertilizer, feed and fodder etc. Also, the extension agencies are not in a position to supply inputs to so many farmers which is the responsibility of other organizations like BADC (supplying mainly crop seeds) and limited number of government hatcheries (supplying fish and poultry chicks). To the extent of 90%, the input supply is actually dependent on the private sector. Because of market imperfections and inefficiency of the GoB regulatory regimes, the seed companies charge exorbitant price and the quality is not ensured. This applies to crop seeds as well as fish and shrimp/prawn fry, fingerling, poultry and duck chicks. The problem is more acute in the case of HYV and hybrid as farmer to farmer supply or preservation of own seed is not possible for the hybrid and for the HYV the foundation seed must be replaced every three years.
The small marginal and women farmers are in disadvantageous position to access such input as they need very small quantity individually and for that procuring inputs such as from the BADC is expensive. While the extension agencies are not in a position to change market condition, they can do several things including (a) encouraging the CIGs and POs to procure seed for the group, (b) the extension agency staff may check quality by physical examination and even by laboratory test and refer farmers to specific BADC store or reliable dealer, and (c) train some advanced farmers of some easy tips to examine quality. The extension agency officers in Sirajganj indicated that some seed companies are maintaining quality while others are not so careful to it. This implies selectivity and the extension agencies may guide the CIGs to identify good seed and other inputs.

b. Continuity of input supply from the GoB agencies
In the case BADC, it is possible to ensure supply to farmers on a regular basis. But it is difficult for the government agencies, the DLS and the DoF. The DLS and the DoF managed hatcheries and fish seed multiplication farms have limitation to maintain supply of poultry and duck chicks, fish fry/ and fingerlings etc. on a regular basis. The GoB firms lack authority to maintain operating fund. The extension agencies may place an operating fund kept in a special bank account to manage production and sale. The account can be operated by the concerned farm manager together with the concerned Upazila or District head of the DLS/DOF.

c. Transparency and accountability of the service delivery systems
Farmers in Bangladesh have limited access to extension services, for various reasons, and this is true for all sub sectors and all categories of farmers. The poorest categories - the landless, small and marginal farmers and farm women lack access more severely than others. The FIAC to be established under the ARTS following the experience of the NATP is likely to improve the situation. This can be further improved by establishing accountability of the extension agencies to the Producer Organization and enhancing cooperation between the extension agencies and the local government, the UP in particular.

d. Participation
The ARTS is an integrated project comprising three main components that concerns directly serving the needs and aspirations of various categories of stakeholders at the grassroots and the concerned implementing agencies (DAE, DLS, DoF and Hortex) from the national to the Upazila and even village level belong to two administrative ministries (MOA and MoFL). To make sure that the diverse primary stakeholders are reached and particularly the weaker groups like the poorest farmers, tribal people and women are not excluded requires enhancing participation of these primary stakeholders. But how to ensure or at least encourage their participation remains an important issue.

The ARTS should take initiative to encourage participation of various stakeholders, particularly of the poor and women in various activities that suit locally. This could include family based poultry, aquaculture, horticulture and vegetable production which benefit the poor and women in particular. Traditionally, partner NGOs are hired to organize groups and reach services to the groups. However, the ARTS will channel it through its own extension staff in the case of DAE and through own staff and community level extension agents in the case of DLS and DoF following the practice of the NATP.
e. Elite capture
Elite capture of community based organization is a potential risk in all components but more importantly in the technology adoption. It is difficult to avoid such elite group because they hold local power. Reaching the genuine landless and poor requires long organizational process rather than just forming groups or listing of intended beneficiaries. The facilitating organization must be physically present in the community say in the UP and not outside of the community say in the Upazila or district town. This will help them continuously observe and find truths. Fake names will eventually go and genuine ones will be coming up, gradually, the poor, poorer and poorest ones.

Elite capture is difficult to avoid but it is not impossible. Doing it requires awareness of the problems, the local contexts - identify the elite, the touts, their stakes and linkages - and then act proactively. For the ARTS the task must involve the extension agency officers, the community level extension agents and close cooperation with the local government leaders, the UP members and chairman. Efforts must be made to orient the local stakeholders including the elites explaining the project objectives, the target groups and importance of delivering services to the target groups on a priority basis. Such reorientation will help reducing elite capture although it may not be fully eliminated.

f. Institutional Sustainability
Community level work tended to depend on donor or GoB supported projects. ARTS project too is not an exception to it. Once such project expires, the activity ceases and the target groups are frustrated. In the case of GOB project, continuing assistance through recurrent budget is a possibility but the support provided under the recurrent budget remains low and inadequate.

The ARTS project has an advantage that it targets community capacity building. The CIGs and POs established will receive training in both technology packages and organization management. One criterion to judge project success would be sustainability of the CIGs and POs beyond the project period.

g. Land acquisition and resettlement:
The project does not involve any land acquisition and physical construction. Hence there is no resettlement issue. However, the technology adoption component in the DAE part involves promoting surface water irrigation. The surface water irrigation will however not include re-excavation of canals or construction of dykes to avoid involuntary resettlement. It is however likely to include setting of buried pipes and the use of flexible pipes from the LLP point to particular piece of land up to a few hundred meters.

In the case of flexible pipes, there is no land issue. In the case of buried pipe too there is not much land issue. It will simply require digging land to set pipes and after that the pipes will be covered by earth filling. It may have several pits in the corners of land. To execute the work it will be needed to hold dialogue between the adjoining landowners to decide where to set the pipe, when, locate the pits and whose land to get water. Agreement has to be reached among the landowners and water users to avoid any damage to standing crop
and if unavoidable to mutually compensate. The concerned CIGs and the POs should take care of the dialogue and the concerned executing agency will have a facilitating role and ensure that no conflicts arise or if any are resolved and grievance redressal mechanism in place and function properly. It is advisable that, in the case of supplementary irrigation buried pipes will not be allowed and also in the case of permanent nature of irrigation sub projects, buried pipes will be avoided as much as possible and other alternatives like flexible pipe will be preferred.

Issues Relevant to Supply Chain Development Component
The main issues relevant to the SCDC include the following:

a. Health safety
The SCDC will promote mainly fruits, vegetables, milk, eggs, dairy products, betel leaves, onion, chilli, spices etc. directly consumed by humans, in cooked or raw form. Hence the use of pesticides, fertilizer and other agro-chemicals are likely to have higher residual effects than for example rice and other cereals. It is therefore more important that the use of harmful agrochemicals are avoided or minimized. Examples can be cited of brinjal that uses too much of pesticides. Further, formalin is used for preservation of fruits, vegetables, milk and fish while harmful chemicals are also used for ripening of fruits. The ARTS pledges to promote organic farming in the production, as well as in the post-harvest covering the whole supply chain. This involves sacrificing quantity or yield for quality or health safety and requires premium price for the quality produce. The normal marketing may not ensure premium price hence the ARTS pledges to improve market linkage for the CIGs and the POs.

b. Pollution
Several high-value crops are likely to increase the use of chemical fertilizer and pesticides that can pollute particularly water, air and soil and thereby affect biodiversity, fisheries and livestock, besides the humans, unless agro-chemicals are gradually replaced by green manure and IPM. The livelihoods of fishers can be affected if the use of chemicals continues to increase.

II. SOCIAL MANAGEMENT

3. Social Management Framework

Baseline Description
The ARTS will directly contribute to increased agricultural productivity in the target areas and with emphasis to target farmers and it will contribute to enhanced productivity of crops, fish, milk, meat, eggs etc. and improved food security, living condition, access to education and health and nutritional standard etc. for the target farm households in the ARTS districts.

The ARTS components and activities are unlikely to adversely affect any disadvantaged group. The project design is such that the research activities are determined through effective consultations with the relevant stakeholders to ensure that the technology to be developed by the researches are need based and suited to local agro-ecological conditions.
The technology adoption activities also will be very participatory in nature, to be selected by the farmer groups. Therefore it can be expected that the component activities are pro-poor and they adequately take into account of the interests of the weaker groups like the landless, poor and women. However, there remains some concern like elite capture. The project will avoid land acquisition and resettlement.

The type of interventions to be implemented under each component and the implementation mechanisms are all fairly known. Hence the outcomes are also known and predictable. The unforeseen adverse consequences will be minimal but it may not be possible to fully avoid them. Considering the above, it is felt important that the ARTS project makes some special arrangements to avoid unpredictable adverse consequences or uncertain outcomes. To overcome such possibilities, a simple social safeguard management framework has been proposed to be applied in the components 2 and 3 and an outline of consultation process and mutual compensation mechanism proposed for causing any loss to standing crops such as while installing buried pipes.

**The GoB Social Regulative Framework**

The constitution of the people’s republic of Bangladesh pledges

- A society, “free from exploitation in which the rule of law, fundamental human rights, freedom, equality and justice - political, economic and social, will be secured for all citizens”. – Preamble page
- “Ensure participation of women in all spheres of national life.” – Article 10.
- “Emancipate the toiling masses – the peasants and workers – and backward sections of the people from all forms of exploitation”. – Article 14.

The Government of Bangladesh has several important policies pertaining to development of agriculture – crop agriculture, fisheries and livestock and the policies incorporate social safeguards in relation to the development of agriculture, besides economic growth. Such policies are many in number including:

1. National Agriculture Policy, 1999 and 2010 (Final Draft)
4. National Food Policy, 2006
6. Sixth Five Year Plan
7. Land Acquisition Ordinance 1982

The above GOB policies in general emphasize equity and give special attention to the disadvantaged groups. Some of the most relevant policies emphasize the following:

**The World Bank Safeguards Policies**

This social assessment briefly examined the applicability of World Bank operational policies on social safeguards related to Indigenous Peoples (OP 4.10) and involuntary resettlement (OP 4.12).

In the case of OP 4.10 on Indigenous Peoples, the WB requirement is to ensure free, prior and informed consultations with the tribal communities, eliciting their broad support to the
project and ensuring that there are effective **grievance redressal mechanisms** in place for these communities.

The World Bank’s Policy on resettlement suggests and aims that the **involuntary resettlement should be avoided** where feasible or minimized by exploring all viable alternative designs. And, where it is not feasible, resettlement activities should be conceived and executed --- enable the persons displaced by the project to share in project benefits. The displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs. Also the displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to the levels prevailing prior to the beginning of project implementation, whichever is higher.

**Rationale for the Social Management Framework**

Although the project will not have any adverse social impact, this social management framework has been prepared to ensure overall social sustainability of the project and better address the issues relevant to the weaker segments of the farming communities and fully avoiding land acquisition and resettlement.

The SMF will be used to assess related social/resettlement aspects of the subprojects to be funded under the project components and develop appropriate measures to mitigate consequent potential adverse social impacts. The SMF presented here is generic and more specific sub project level information will be known during the design of site-specific sub-projects. The Frameworks will therefore serve as guidelines to assess the social impacts of the relevant subprojects and mitigate adverse social aspects both in the design and implementation phases of the subprojects. This exercise will be done while preparing the micro plans, once a year in the UP level with the full involvement of the CIGs and the POs.

**Likely Social Impacts of the ARTS Interventions**

**Possible Social Impacts under Research Component:** Although no adverse social impacts are envisioned under this project component, the issues like prioritization and inclusion of research sub projects on the basis of needs identified by the farmers and the extension agencies should be addressed properly. The researches should be of adaptive nature and take into consideration of farmers’ affordability to use and benefit from the new technology. The technology developed must be eco-friendly, pro-poor and women-friendly. It must also take into account of negative effects of the increased use of agro-chemicals and enhance research extension linkage.

**Possible Social Impacts under Technology Adoption Component:** Although no adverse social impacts are envisioned under this component, proper identification and targeting of project beneficiaries and developing a participatory and inclusive communication and consultation strategy is imperative; as in the absence of these, there is risk of causing marginalization, especially with respect to women farmers and those with relatively smaller land holdings or belonging to ethnic minority/tribal groups, and landless fishers. It appeared from discussion in the field that the sharecroppers are excluded as they are not “permanent” farmers. The extension officers’ perception is that they may leave farming as
owners may not agree to lease out land next year, which is however not fully correct. If one owner disagrees to lease land to a particular farmer, the tenant or share cropper will approach other owners, will find some other land and will stay in farming in most cases.

Another adverse effect can be through increased use of chemical fertilizer, pesticides and other agro chemicals affecting aquatic biodiversity, particularly the fisheries resources and thus negatively impacting the livelihoods of the fishers and the fish farmers.

Possible Social Impacts of the Installation of Buried Pipes under the Technology Adoption Component:
There is no land acquisition involved hence no resettlement will be needed. However, there will be a need for reaching agreement between the landowners and water users for the installation of buried pipes. Concerned extension staff, CIG and PO will facilitate in this regard and monitor compliance and redressal.

Possible Social Impacts under Supply Chain Development Component: Adverse effect of the SCDC is foreseen concerning health safety of humans for the likely increased use of pesticides and chemicals as preservatives of fruits, vegetables and milk and ripening material for fruits. Increased use of pesticides can further aggravate water pollution causing deterioration of open water fisheries resource and thereby negatively affect the livelihoods of the fishers. Seepage of agro chemicals to ponds can affect aquaculture production affecting the livelihoods of the fish farmers.

Prevention of Negative Social Impacts
It is important to note that the ESMF Toolkit of the World Bank suggests that the ESMF should advise communities and extension teams to try to avoid the need for special planning reports (e.g. EMP, RAP) since they require extra resources (and time) to prepare and indicate less than ideal project design.

The case of the ARTS is straight forward as it does not involve land acquisition and the sub projects concern mainly supporting the small and marginal farmers and women farmers as with technologies involving mainly improved management practices. So, there is very little scope to adversely affect any social group. The RAP can be fully avoided and other concerns like inclusiveness, equity, participation and elite capture can be mitigated by proper consultation process, a social management plan and participatory planning and M&E.

However, to ensure that the project meets its main objectives and the relevant safeguards, a set of exclusion criteria will be applied particularly addressing the issue of involuntary resettlement and tribal peoples. For other issues, mitigation measures will be planned and implemented which are discussed in the next section.

The screening process will ensure that:
- The sub projects requiring land acquisition and involuntary resettlement will be excluded.
- Activities likely to adversely affect wildlife, fish habitat, common property resources, livelihoods of marginalized groups etc. will not be included under any sub project.
• The sub projects involving larger water management interventions particularly requiring canal excavation will be avoided as it may involve land acquisition and involuntary resettlement.
• Sub projects requiring constructing permanent structures on private land will be excluded.

The screening process will include a desk appraisal in the Upazila level while consolidating the UP level Micro Plans (format for preparing sub projects to be included under the UP micro plan is provided at Annex 3). If the desk appraisal indicates that the proposed subproject may have environmental or social concerns that are not adequately addressed in the application, a field appraisal will be conducted before further processing and clearance of the specific sub project interventions.

**Inclusion and Selection Criteria**
Besides the above exclusion criteria, the project will apply several selection or inclusion criteria so that the intended target groups, particularly the weaker and vulnerable ones are not excluded. The selection process will involve several steps – geographic selection or selection of Upazila and Union followed by selection of beneficiary community, group, individual sub projects and individual beneficiary farmer or household.

As indicated in the project concept note, the six project districts and 30 Upazilas are already selected. The Union Parishads are not pre-selected. There is a requirement that the UP to be selected has UP Complex building where the FIAC will be located.

Selection of Union Parishad will be followed by selection of communities. Criteria for selection of UP may include ecological vulnerability, economic deprivation or poverty, potentials to develop, avoid overlapping with on-going and up-coming project, continued efforts of good learning of recently completed projects, and likely cooperation of the local government and community.

The formation of farmers’ common interest group (CIG) and Producer Organization (PO) will consider:
• Whether the household belongs to the target group – small and marginal farmer – not owning above 2.5 acres land
• Directly involved in agriculture – not absentee owner leasing out or sharecropping out all land
• Directly involved in the concerned sub sector, in the case of crop/ fisheries/ livestock groups
• Belongs to the specific tribe – in the case of tribal peoples’ group
• Is willing to participate in the group activities
• The group is not likely to be elite-captured, non-poor are oriented and are fully aware of project objectives, approach and targets so that they help local poor to manage the group without interference but moral support.

• About 80 percent of the CIGs are formed with households owning below 2.5 acres land.
• About 20 percent of both CIGs in the Small and Marginal Farm category and 20% of the CIG members in the Medium to Large farm category will be women farmers, preferably, from the female headed households.
• In the case of tribal communities, the CIGs can be mixed comprising both male and female members in case about 20 members from tribal households found in one community. Otherwise, the farmers of tribal households will be included in the CIGs of farmers from the Bangalee society of the same village/area.
• In the case of crops and livestock sub sectors, the CIGs will be different for men and women farmers but in the case of fisheries the CIGs can be gender mixed and also of varying pond size (not above 0.33 acre, 0.34 acre to 1.0 acre, above one acre).

Mitigation Measures
The mitigation measures will include:
Effective targeting and enhanced participation through
• Community mobilization, organization and capacity building of small scale and marginal producers into “common interest” groups will follow the decentralized, demand led extension approach.
• Beneficiaries will be identified through a community consultation and field level surveys.
• Where necessary, the existing farmer groups like the IPM and ICM Clubs will be reorganized and reactivated and where necessary, new groups will be organized by the concerned extension agencies.
• Beneficiary groups will in turn be federated into union-level farmer’s associations, called Producer Organizations or POs.

Social Assessment, Baseline Surveys and identifying issues and mitigation measures ensuring that:
• A built–in system of M&E is established, with evaluation indicators for all project interventions.
• Carryout community mobilization, facilitation and capacity building activities by the extension agencies with the participation of the CIGs and POs.
• Effective identification and selection of targeted community-based groups of marginal and small farmers to benefit
• Supervision of the equitable distribution of benefits to selected farmer groups.
• The project authority will carry out annual yearly review and prepare annual reports for all components.
• An independent third party monitoring will also be carried out at the end of the first and second years and an evaluation at the EOP in which the annual report will be an input.

Impact Matrix
Generally, the impact of the research component will be increased agricultural production and higher income for the farmers. It is expected to transforming the currently high-risk, low yielding and low-rewarding crop, livestock and aquaculture production system to comparatively low-risk, high-yielding and better rewarding system.
Expected impacts of the technology adoption component include increased availability of good quality seed of crops, fish fry, fingerlings, AI services and day old poultry chicks all contributing to higher level of productivity and farm income. The technology adoption component will include improving irrigation efficiency by providing buried and flexible pipes and promoting supplementary irrigation particularly for the aus and aman crops. All these will contribute to increased productivity and farmers’ income and welfare.

The supply chain development component intends to provide better price to farmers by improved marketing, sorting, grading, packing, collection points and supply of better quality inputs etc. This will increase profitability of farmers and at the same time improve availability of better quality produce for the farmers at reasonable price. It will increase particularly the producers’ share of the retail price.

For each component, some indicators have been identified at various levels, the output, immediate and overall outcome levels shown in the matrix in the main text of this report.

**Land acquisition and resettlement**

Broadly, the project will not require land acquisition hence there is no issue of resettlement. Since the project duration is only three years, it is has totally avoided land acquisition and physical construction. One activity under the technology adoption aims reducing leakage of water in the surface drains and for that purpose the installation of buried pipes and flexible pipes are suggested. For the flexible pipes there is no resettlement issue. For buried pipe, there will be a need for consultation between farmers of the adjoining land and the water users to agree on a plan avoiding even temporary damage to crop and by adjusting alignment or timing of installing pipe or to a mutual compensation arrangement.

**Tribal Peoples Management Framework**

Although there is very little concentration of tribal people in the ARTS districts, the project authority in the district and Upazilla will ensure that if such communities are found, they are identified, consulted and are given opportunity to participate and benefit from the project, rather than excluded. Therefore, as part of the SMF, a Tribal Peoples Management Framework (TPMF) is being prepared for the ARTS as a whole. The TPMF aims at enhancing participation of the tribal people or small ethnic community people, whatever the term used, throughout the project cycle. The general objective of the TPMF is the inclusion of TP in the project in order to achieve the highest possible positive impact of the interventions to improve their quality of life.

Based on the TPMF and on the assessment the need for a Tribal Peoples Development Plan (TPDP) will be established. The TPDP for the involved UPs will comprise:

i) Making a village wise list of TP households

ii) An assessment of probable positive and negative impacts of any sub project;

iii) Suggest mitigating measures; and

iv) Arrangements for the participatory M&E.

**Gender Assessment Framework**

Mainstreaming gender equity and empowerment is already a focus area in the ARTS and women are treated a special target group in all project components. In the sub projects
under the Technology Adoption and the SCD components will particularly address women’s needs with priority and will create opportunities for participation in the CIGs and POs. A Gender Assessment Framework (GAF) is provided below as part of SMF which will help analyze gender issues during the preparation stage of sub project and design interventions.

*Gender analysis will* be an integral part of the social impact assessment in ARTS sub projects. The project design will be gender responsive based on the gender analysis. The findings and recommendations from the gender analysis during project planning and feedback from beneficiaries during implementation will be discussed thoroughly to determine the need for further action.

**Disclosure**
The Draft SMF will be made available for public consultation by the implementing agencies, with key portions translated in Bangla. It will be displayed at places accessible to affected people, primary stakeholders and members of the civil society. It will also be available at all offices of the involved executing agencies and the MOA and NATP and the World Bank websites. Comments will be invited from all. Once all comments have been addressed, the Bank will disclose the document publicly. After the Bank finally approves the document the implementing agencies will once again make the final version publicly available with key portions translated in Bangla, electronically on their respective websites and place hard-copies in easily accessible places. Information about these locations will be advertised in local newspapers (English and Bangla).

**4. Institutional Arrangement and M & E Framework**

**Implementation Arrangement**
The GoB ministries involved in the project for overall direction, periodic monitoring and oversight are the Ministry of Agriculture for the crop sub sector and the SCDC and research and the Ministry of Fisheries and Livestock for the fisheries and livestock sub sectors. Several other ministries and divisions of the government are involved in the project planning and implementation process including the (a) Ministry of Finance, (b) Economic Relations Division, (c) Planning Commission, and (d) Implementation Monitoring and Evaluation Division of the Ministry of Planning.

To manage this multi sub-sector and multi-agency project the GoB has a Project Steering Committee (PSC) for the NATP which is headed by the Secretary, Ministry of Agriculture and co chaired by the Secretary, Ministry of Fisheries and Livestock. No separate Steering Committee is proposed for the ARTS to avoid administrative complexities and the PSC for the NATP will carry out the same tasks for the ARTS.

**Monitoring and Evaluation Framework**
It should be emphasized that the GoB has a monitoring system where the concerned ministries monitor and review progress of individual projects on monthly and quarterly basis. The GoB has a set of very detailed monitoring formats developed by the IMED who periodically review progress and report to the Executive Committee of the National Economic Council. The monitoring system and formats are however quite complex and need further simplification.
In donor assisted projects, the PDs are required to prepare another set of reports for the donor, apart from one for the IMED. Ideally, the IMED reporting format should have been able to serve the purpose of both GoB and donors but this is unlikely to happen and is outside of the scope of this project. However, the project can try to make M&E format simple enough so that most information can be obtained from the IMED report and limited extra ones provided by the project.

**Internal Monitoring**
The project will submit reports in IMED formats to the respective ministries and the concerned ministries will forward the reports to the Planning Commission and IMED. The IMED reports tend to focus financial and physical progress in the activity level but they say little or nothing about achievements of output and outcome targets. There is difficulty of understanding the complex formats and they are often filled up to meet up requirements and deadlines under extreme pressure from above but without proper understanding.

Therefore, for the use of the PSC, the PD, NATP will prepare consolidated reports for all components and submit it to the MOA with copies to MoFL, Planning Commission, ERD and World Bank. The MOA after scrutiny and approval by the PSC will submit it to the World Bank with copies to Planning Commission, ERD and MoFL. The project will provide a very simple format prepared by competent M&E experts.

**External Monitoring and Evaluation**
While the internal monitoring is likely to provide the needed physical and financial progress data, external monitoring will focus more on the implementation process, problems, constraints and achievement of output and outcome against the respective targets. External monitoring and evaluation will be conducted by independent experts or organizations under contract with the World Bank. This fund will not be channelled through any implementing agency to avoid any scope of being influenced.

The external monitoring and evaluation will specifically assess
- Whether the broader objectives of the project and of each component are met, what difficulties are there and suggest corrective measures
- Whether the project impacts on key social, economic and environmental indicators show positive trend, what difficulties are there and suggest corrective measures
- Whether the project strategy of inclusiveness, participation, transparency, public accountability and equity etc. are followed specifically in technology adoption and supply chain development components.

**Monitoring Strategy**
Monitoring in the ARTS should be done in a participatory manner and should be a bottom up process. The participants in monitoring and evaluation particularly in the case of reporting the grassroots level activities, output and outcome the respondents should include farmers, farm women and other primary stakeholders. Self monitoring by the community with the facilitation of the extension agencies will be a main input to both internal and external monitoring. To enable the extension agency field level officers, the project will provide training, guidance and simple formats. The SMF has defined a set of indicators for the purpose of M&E of the ARTS.
Volume I: Social Assessment

1. Introduction

This report has been prepared for the Bangladesh Agricultural Technology Support (ARTS) Project to be implemented in six ecologically constrained and socially disadvantaged districts of Bangladesh in the north and south regions. The districts are Sirajganj in the northwest (vulnerable to river flood and riverbank erosion along the river Jamuna), Magura in the southwest (drought prone), Shariatpur, Madaripur and Gopalganj in the south (vulnerable to river flood and water logging) and Bhola in the south (an island district vulnerable to tidal flood, riverbank erosion, cyclone and salinity). Ministry of Agriculture, Government of Bangladesh, undertook this Social Assessment and developed Social Management Framework of the ARTS project with the assistance of the World Bank. The World Bank Office, Dhaka engaged two consultants to carry out Environmental and Social Management Framework under which this report is prepared as Social Management Framework. It comprises a Social Assessment and a Social Management Plan.

1.1 The Country Context

1.1.1 Economic Growth and Reduction of Poverty

Bangladesh has made considerable progress in economic and social development, sustaining high rates of economic growth of around 5.5 to 6.3 percent annually over the last ten years and reducing poverty by 9% between 2000 and 2005 (from 49% to 40 %) and further down to 31.5% in 2010. One of the main contributors to this growth and more importantly in poverty reduction, is the agriculture sector which is growing at about 4.1% annually\(^1\), much faster than population growth (1.4%) and has achieved near self-sufficiency in terms of production of its staple food—rice. The country has achieved a number of MDG targets of 2015 already, such as gender equality in primary and secondary education and is on track in achieving several other targets such as reducing poverty down to 29%, under 5 mortality down to 48 per thousand live birth by 2015 (which has already come down to 50) from 146 of 1990.

On the whole, the country has achieved success to increase primary school enrolment from 60.5% in 1990-91 to 95% in 2010 but due to high dropout, only 67% of the enrolled children complete primary education. Adult literacy increased to 58% in 2010 from 37% in 1990-91 but is still below the MDG target of 100% primary school completion and 100% adult literacy. Further, despite increasing food production faster than population growth, 45% children are underweight (low from 48% in 1990-91) but is far away from the MDG target 33 percent.

One constraint to further enhancing economic growth and reducing poverty is frequent natural calamities like flood and cyclone SIDR of 2007 and cyclone AILA of 2009. Another challenge is improving governance and stable democratic process which could place the country to the highway of social and economic development and real “freedom\(^2\) of people”.

\(^1\) BBS. Statistical Yearbook 2010. The SFYP however projected agriculture sector growth of 5.0 percent.

All of the six ARTS districts are located in poverty-stricken northwest and southern regions. Upazila level poverty map of the WFP-WB shows that various Upazilas of Sirajganj district have poverty between 48 and 60 percent. The southern and eastern Upazilas of Bholo (Charfassion, Monpura, Daulatkhan) have poverty above 48 percent and the other Upazilas have below 48% poverty. Magura and western half of Shariatpur have lower poverty- 20-36% while Madaripur, eastern half of Shariatpur and Gopalganj have poverty between 38 and 48 percent.

It is evident that the districts and Upazilas in backward areas and with disaster vulnerability have high poverty than others. Examples are isolated island Upazila Monpura, extreme southern coast Upazila Charfassion, river erosion prone Daulatkhan of Bholo and eastern half of Shariatpur. Sirajganj has high poverty and this is a flood-prone district, but poverty in this district declined in the recent years. The Jamuna chars of Sirajganj in particular are geographically isolated and poorer. The Jamuna Bridge has improved road connectivity of Sirajganj and it has created ample opportunity for the development of the district. Road connectivity also improved in the south but the absence of Padma bridge remains a main constraint to the development of the southern districts.

1.1.2 Current Scenario of the Agriculture Sector

Despite gradual shrinkage of share, agriculture remains the largest economic sector, contributing about one fifth of the GDP and more importantly, it still employs nearly one half of the labour force. Rice remains the dominant crop but there has been substantial change, a move away from rain-fed and mainly local varieties of Aus, Aman and traditional wetland Boro paddy to irrigation-dependent dry season HYV Boro, and recently, hybrid Boro. Country’s tripling of rice production in about three decades has been mainly due to this transformation, popularly known as seed-fertilizer-irrigation technology. The increased rice production led to shift of land from mainly other winter crops to HYV Boro, reducing area and production of pulses, spices and oilseeds. Over the last few years however, increased emphasis on high-value crops like maize, vegetables and fruits have made some change and crop diversification is taking place again. But lack of appropriate technology application in storage, processing and marketing has constrained a speedy move to this direction. Also there have been changes in farming system. Shorter duration aman varieties increased particularly in the northwest which has made possible to grow oilseed, potato, pulse, onion etc. between aman and boro and short duration aus between boro and T. Aman. In the southern districts of Madaripur, Shariatpur and Gopalganj, mustard is grown in large areas between aman and boro.

Government of Bangladesh has quite extensive infrastructure in agricultural research, education, and extension although input supply has been largely privatized with regulatory authority kept with the government but quality not ensured. There has been weak linkage among the service providers and particularly the institutions still lack capacity and motivation to adequately meet up the farmers’ needs. Limited number of NGOs are active in the agriculture sector; a few of them achieved considerable success to reach the farmers at the grass roots; and numerous community based organizations have been formed and assisted under various projects but their sustainability remains a concern and efforts tend to end when a particular project closed.
1.2 Project Description

1.2.1 Background of the Project

The ARTS project has been framed with the experience of a very successful project, the NATP which has been implanted in 120 Upazilas all over the country and is likely to be extended to its next phase. The main feature of the NATP is its approach to work with the farmer groups, called Common Interest Group (CIG) of farmers. The farmers in particular CIG have some common activities like producing particular crops or engagement in specific sub-sectors- aquaculture, livestock, horticulture or floriculture. The CIGs are also homogenous in terms of farm size and gender, male or female farmer. The CIGs are federated to Union Parishad level Produce Organization (PO). Each PO prepares yearly micro plan which is the basis of carrying out of all activities under the project. The concerned extension agencies; the DAE, DLS, DoF and Hortex Foundation organize training, demonstration, marketing support and other activities as per the need of the farmers. The farmers are also provided service through the Farmers Information and Advice Centres located at the Union Parishad level making sure that the extension staff regularly available in there. Besides the technology adoption and supply chain development activities noted above, the ARTS comprises a strong research component that promote development of promising technologies by short duration research by competent academics and practitioners as well as conducting of more fundamental but immediate need based research by the Universities and ARIs under the Competitive Grants Programme (CGP) and Sponsored Public Goods Research (SPGR) respectively. The project established strong extension research linkage by supporting policy reforms and coordination through the BARC and the NARS.

The NATP results are impressive hence deserve extension to other areas which are now underserved and constrained by various ecological, economic and social barriers. This will not only benefit more farmers in new areas but also will provide the concerned agencies to apply their learning in new setting, addressing new problems and challenges and thereby expand and fine-tune the NATP approaches at a stage when a new phase is under formulation.

Seeing the success of the NATP, the USAID has committed a grant of USD 25.0 million to execute a similar programme in new deserving areas. It was also intended to include some of the existing NATP Upazilas to carryout deepening of ongoing NATP activities but ultimately this has to be dropped to avoid multiplicity of approaches in the same areas. All of the presently proposed Upazilas for the ARTS are new areas where NATP has not been implemented so far. The ARTS activities will be fewer but focussed as the project duration is only three years.

1.2.2 The Project Components

The ARTS project comprises four components- agricultural research support, technology adoption, supply chain development and project support and coordination unit. Brief description of the components is following:
Component 1: Agricultural Research Support

The purpose of this component is to enhance efficiency and effectiveness of the National Agricultural Research System (NARS). This is a grant-based activity that is nationwide in scope and funds will flow through two windows:

- **Competitive Grants Programme (CGP)** will finance collaborative short to medium term applied and adaptive research by public, private, civil society and academic institutions. It will also provide funds to increase the capacity of the KGF, the implementing agency, with 2 or 3 experts in the team.

- **Sponsored Public Goods Research (SPGR)** will provide long term strategic and crosscutting research on production and improvement of critical crops – e.g., pulses, spices, oil seeds, horticulture and floriculture etc. aiming at improving varieties to meet consumer demand and adapt to changing conditions such as climate change and increased water logging. It will also support research programmes on disaster management, ICT, livestock, farm machinery, post-harvest technology, farm management and other issues.

Component 2: Technology Adoption

The purpose of this component is to establish a decentralized and demand-driven extension service that is knowledge intensive as opposed to input-intensive and that is accountable to farmers, particularly the small and marginal farmers. It will emphasize further scaling up of best practices emerging from the National Agricultural Technology Project (NATP) and increasing the adoption of low-risk/ high-rewarding in underserved remote areas through (i) mobilization of CIGs; (ii) decentralized extension service; and enhancing efficiency of national institutions involved in agricultural extension.

Component 3: Supply Chain Development Component (SCDC)

The purpose of this component is to increase and diversify sources of income for small and marginal farmers by identifying local, national and international markets for producers and facilitating the services that will help them access those markets on competitive footing. Under the NATP, this component was limited to 10 districts. The ARTS will enable it expand outreach to additional districts and scaling up of existing good practices.

Component 4: Project support coordination

This component will monitor and evaluate investment activities and enhance communication throughout the agricultural research, development and extension system. It will also finance special studies related to the project objectives. The PCU of the NATP will assume overall coordination for implementation of the ARTS (along with the PMUs in the respective agencies). The existing NATP institutional setting in the national level will execute the project along with the district and Upazila level offices of the executing agencies.
The US Aid will provide USD 25.0 million in the trust fund and the World Bank will act as sole administrator. After deducting standard World Bank management fee, the amount available for direct investment will be USD 23.715 million. The fund will finance grants, goods, works, services, training and overhead costs associated with implementing the grant activities. The project team will provide detailed information on the final project design and cost by component and expenditure categories in the Project Appraisal Document.

1.2.3 Types of Interventions

Interventions under two main components are more relevant to the Social Assessment and the Social Management for more direct interactions in the farming communities. Hence these two are discussed more elaborately in this report.

Component 2, technology adoption will be executed by three extension agencies- the DAE, DLS and DoF. The extension agencies under this component aims to establish a decentralized demand-led market oriented extension services which will be knowledge based with greater accountability and responsiveness and higher emphasis to small and marginal farmers. The proposed interventions would draw on lessons learnt and best practices from the NATP Phase- I in Bangladesh.

The component activities will be implemented in a total of 30 Upazilas of six districts and these are common for all three extension agencies.

Table-1: Proposed Upazilas for Agricultural Research and Technology Support (ARTS) Project: Technology Adoption Component

<table>
<thead>
<tr>
<th>SL</th>
<th>Division</th>
<th>District</th>
<th>Total Nos. of Upazila</th>
<th>Proposed under ARTS</th>
<th>Upazilas proposed for ARTS</th>
<th>Special features of the district</th>
</tr>
</thead>
</table>

Total 6 districts 35 30 30 Upazila
The project area has been selected as per the following criteria:

- Climatically distressed (salinity, drought, erratic rainfall, flood prone, riverine and water logged) areas with high potentiality to adopt climate resilient technologies for livelihood improvement and income generation;
- High concentration of small and marginal farmers but also presence of significant number of poor and pro-poor livelihoods opportunities through agribusiness development initiatives;
- Slow development due to very limited number of development projects and development initiatives;
- Low level of cropping intensity but higher scope of crop diversification and intensification through available technology and knowledge;
- Presence of prospective and interested farming community fighting with poverty and malnutrition;

On the basis of the above criteria, the above 30 upazilas under 6 new districts have been proposed in the project.

The CIG will be formed considering **Whole Village Integrated Approach**. So, the project area of ARTS DAE sub component will be consisted of 4,983 CIGs in 321 unions under 30 upazila. The direct beneficiaries of the project will be 99,660 CIG members of which 79,728 are expected to adopt improved technology, and 797,280 non- CIG farmers will follow them. Hence a total of 877,000 crop farmers will be directly benefited in 3 year.

The key elements of the decentralized and demand-led extension system will be the mobilization, organization and capacity building of mostly small and marginal farmers (about 80-85%, another 15-20% will be medium to large farmers) into common interest group (CIG) by the DAE following Whole Village Based Integrated Approach. CIG would be federated into Producers Organizations (POs) at the Union, Upazila and District levels, with an initial focus on developing union level organization for facilitating market linkages and agribusiness development. A total of 321 UPOs, 30 UzPOs and 6 DPOs will be capacitate to enhance responsiveness of public service to their needs, promote linkages with private sector and play an advocacy role.

**Component 3, Supply Chain Development Component** will be implemented by the Hortex Foundation. The subcomponent will promote business linkages between farmers, traders, processors, transporters and other service providers (e.g. quality control and finance) in and outside the 5 Upazilas. The project will also promote an NATP-derived technology package: 10 Commodity Collection and Marketing Centres (CCMCs); 32,000 man-days of training and 400 demonstrations to familiarise farmers and the other stakeholders with 20 post-harvest technologies ranging from simple sorting and grading to processing and information communication technologies. CCMCs will enhance capacity of the farmers to operate simple packaging and processing equipments, zero energy storage and chilling facilities for horticultural produces. Such package will be complemented by developing a prototype IT system connecting CCMCs and value-chain actors and enabling to learn for a possible future wider-scope supply-chain software. ARTS will also provide a matching grant for an amount equivalent to the savings accrued by CCMC farmers up to a ceiling.
1.3 Layout of the report
The report comprises two parts. Part - I presents Social Assessment containing five chapters. Chapter 2 describe rationale for the Social Assessment, its scope and methodology. Chapter 3 gives elaborate description of social setting which includes Socio-economic profile of the ARTS districts, Profile of the agriculture sector and Socio-economic scenario of four villages of an ARTS district. Chapter 4 makes a stakeholder analysis and chapter 5 describes the pertinent social issues, general as well specific to various components.

Part- II presents Social Management Framework containing two chapters. Chapter 6 provides a detailed Social Management Framework containing regulatory framework, an analysis on probable social impacts and mitigation measures relevant to installation of buried pipes for irrigation, tribal peoples' management framework and gender assessment framework. Finally, chapter 7 describes Institutional Arrangement followed by an M&E Framework.

The report contains three annexes. Annex-1 provides an outline of a consultation process to avoid conflicts related to installation of buried pipe for irrigation, Annex-2 describes a procedure for preparing Tribal People’s Development Plan, Annex 3 provides a format for preparing Sub Projects to be included in the Union Micro Plan and Annex 4 provides a List of Workshops Attended and Persons Met during this study.
2. Rationale for the Social Assessment and Methodology

While poverty reduction and growth performance for the whole economy were quite encouraging, several regions of the country lagged behind. The ARTS districts in the northwest and south are still crippling to develop mainly because of their location in the ecologically stressed and socially disadvantaged areas.

The ARTS is an integrated approach to develop agriculture sector in the six target districts. It comprises research, technology adoption and supply chain development in all three sub sectors of agriculture – crops, fisheries and livestock.

It is a long-felt-need that the farmers are provided technology dissemination services in all sub sectors through an unified system rather than in isolation, particularly in the village level. The project will have an opportunity to combine the efforts of the three extension departments serving the needs of the farmers.

Past efforts to support farmers in multi-agency and multi sub sector projects faced various constraints both institutional and social in dimension. Particularly, reaching the technology adoption service to the small and marginal farmers and women farmers requires higher attention than usual process.

2.1 Rationale for the Social Assessment
This Social Assessment (SA) has been carried to document the pertinent social issues which may hinder or support implementation of various project activities. This includes both, the positive as well as adverse issues. Based on the results of SA, a social management framework (SMF) has been prepared that provides for mitigation measures for adverse impacts, institutional arrangement and monitoring indicators.

The SA comprises the following:
- Review of Project Document, currently, the Project Concept Note submitted by the GoB along with component level concept notes from the concerned executing agencies;
- Identification of the relevant social issues, concerns, problems and prospects – which may have both positive and negative impacts. These may concern specific components, sub projects or the whole project in general or of the sub sectors;
- Develop strategies to mitigate any adverse effects and augment positive results;
- Identify areas of needed capacity building such as for the implementing agencies, CIGs, POs and extension agents etc.; and
- Development of a framework for Management of Social Impacts for all components to be applied during project preparation and implementation and the O&M phase.

2.2 Methodology
Given the time constraint, the assessment was carried out primarily based on secondary data coupled with (a) consultation with the extension agency officials in all of the six districts, and (b) visit to four villages in an ARTS districts. The consultation with the executing agencies comprised five workshops held in Dhaka and four district level workshops.
3. **Social Setting of the Project Area**

3.1 **Socio-Economic Profile of the ARTS districts**

Bangladesh, the world’s most densely populated agricultural and rural society, has total population of 150\(^3\) million with total land area of only about 148,000 sq kms indicating average density over 1000 people per sq km. Least endowed with proven mineral reserve, the country’s main resources are land, water and people and is blessed with vast fertile deltaic plain land, one of the world’s largest fresh water sources from the rivers along with availability of high quality ground water for both drinking and irrigation. And, of the 150 million people, average 22 years of age, majority (51.1%) are in the age group 15 to 59 with concentration in the lower age groups (over one third in the age group 15-34 age group) who will remain economically active from now on to the coming decades, are its main assets.

Conventional literacy rate (percentage of people who can read and write) is still low (54.1% for males and 49.4% for females above 7 years age in 2011, as per BBS Population Census 2011) but school enrolment is estimated 95%, school dropout decreasing, and gender parity in both primary and secondary schools has been achieved. It is however important to note that, low illiteracy does not necessarily mean poor knowledge, particularly in the context of the rural communities, as far as their life and livelihoods are concerned. This is because of the richness of local knowledge which can very efficiently interact with new information and ideas in agriculture.

3.1.1 **Demographic Profile**

Bangladesh’s present population is around 150 million and enumerated population as per Population Census 2011 which grew at 1.4% annually during the past ten years compared to 2.83% during 1974-81. **Table-2** shows area, population density, household size, male female ratio, literacy etc. of the six ARTS districts.

The ARTS districts have total population of about 9.287 million living in 10,618 sq kms area with population density of 875, a bit lower density than country average 1,015. Sirajganj and Madaripur have higher than national average density and other districts have lower density. Sex ratio is near unity for the country and in Sirajganj district and in other districts women outnumbered men with varying sex ratio of 94 to 95 percent.

Average household size varied from 4.3 to 4.8 compared to country average of 4.4. Both study districts and the country has about 90% Muslim population and about 10% Hindu and other minority population. The country has as a whole 1.1 percent ethnic minority which include tribal peoples (2011). Distribution of ethnic minority or tribal peoples by district is not yet available in the Population Census report 2011. The population Census 2001 shows that in Bhola district about 0.76 percent people belong to ethnic minority groups and in other districts it varied from 0.04 to 0.20 percent (0.22% in ARTS districts).

---

Table-2: Area and Population of the Programme Districts

<table>
<thead>
<tr>
<th>SL</th>
<th>Particulars</th>
<th>Sirajganj</th>
<th>Magura</th>
<th>Madaripur</th>
<th>Gopajganj</th>
<th>Shariatpur</th>
<th>Bhola</th>
<th>Total: Project Districts</th>
<th>Country Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Area (Sq km)</td>
<td>2,403</td>
<td>1,040</td>
<td>1,126</td>
<td>1,469</td>
<td>1,175</td>
<td>3,405</td>
<td>10,618</td>
<td>147,570</td>
</tr>
<tr>
<td>2</td>
<td>Household (000)</td>
<td>715</td>
<td>206</td>
<td>252</td>
<td>240</td>
<td>248</td>
<td>373</td>
<td>2,043</td>
<td>32,174</td>
</tr>
<tr>
<td>3</td>
<td>Population (000)</td>
<td>3,097</td>
<td>918</td>
<td>1,166</td>
<td>1,172</td>
<td>1,156</td>
<td>1,777</td>
<td>9,287</td>
<td>149,772</td>
</tr>
<tr>
<td>4</td>
<td>Density/sq km</td>
<td>1,289</td>
<td>883</td>
<td>1,035</td>
<td>798</td>
<td>984</td>
<td>522</td>
<td>875</td>
<td>1,015</td>
</tr>
<tr>
<td>5</td>
<td>Male Population (000)</td>
<td>1,551</td>
<td>455</td>
<td>575</td>
<td>578</td>
<td>559</td>
<td>884</td>
<td>4,602</td>
<td>74,980</td>
</tr>
<tr>
<td>6</td>
<td>Female Population</td>
<td>1,546</td>
<td>464</td>
<td>591</td>
<td>595</td>
<td>597</td>
<td>893</td>
<td>4,685</td>
<td>74,792</td>
</tr>
<tr>
<td>7</td>
<td>Sex Ratio (M/F*100)</td>
<td>100</td>
<td>98</td>
<td>97</td>
<td>97</td>
<td>94</td>
<td>99</td>
<td>98</td>
<td>100.3</td>
</tr>
<tr>
<td>8</td>
<td>Av. Household Size</td>
<td>4.3</td>
<td>4.5</td>
<td>4.6</td>
<td>4.7</td>
<td>4.7</td>
<td>4.8</td>
<td>4.5</td>
<td>4.4</td>
</tr>
<tr>
<td>9</td>
<td>Widow as % of 10+ fem pop</td>
<td>8.50</td>
<td>9.1</td>
<td>7.6</td>
<td>9.4</td>
<td>8.1</td>
<td>5.7</td>
<td>8.07</td>
<td>10.4</td>
</tr>
<tr>
<td>10</td>
<td>Sep/div as % of 10+ fem pop</td>
<td>0.7</td>
<td>0.8</td>
<td>0.4</td>
<td>0.6</td>
<td>0.5</td>
<td>0.3</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Literacy Both Sex</td>
<td>42.1</td>
<td>50.6</td>
<td>48.0</td>
<td>58.1</td>
<td>47.7</td>
<td>43.2</td>
<td>48.3</td>
<td>51.8</td>
</tr>
<tr>
<td>12</td>
<td>Literacy (Male)</td>
<td>45.1</td>
<td>52.9</td>
<td>50.1</td>
<td>60.3</td>
<td>48.0</td>
<td>43.6</td>
<td>50.0</td>
<td>54.1</td>
</tr>
<tr>
<td>13</td>
<td>Literacy (Fem)</td>
<td>39.0</td>
<td>48.5</td>
<td>45.9</td>
<td>56.0</td>
<td>46.6</td>
<td>42.9</td>
<td>46.5</td>
<td>49.4</td>
</tr>
<tr>
<td>14</td>
<td>Religion: Muslim %</td>
<td>95.19</td>
<td>82.01</td>
<td>87.8</td>
<td>68.7</td>
<td>96.4</td>
<td>96.6</td>
<td>90.0</td>
<td>89.4</td>
</tr>
<tr>
<td>15</td>
<td>Hindu &amp; Others %</td>
<td>4.81</td>
<td>17.99</td>
<td>12.20</td>
<td>31.33</td>
<td>3.59</td>
<td>3.45</td>
<td>9.98</td>
<td>10.60</td>
</tr>
<tr>
<td>16</td>
<td>Indigenous people %</td>
<td>0.08</td>
<td>0.04</td>
<td>0.20</td>
<td>0.06</td>
<td>0.15</td>
<td>0.76</td>
<td>0.22</td>
<td>1.10</td>
</tr>
</tbody>
</table>

Source: BBS, Bangladesh Census of Population and Housing 2011.

### 3.1.2 Spatial Variation of Poverty

As per the HIES 31.5% of the Bangladesh people lived below poverty line in 2010 (21.7% were hardcore poor) compared to 40.0% in 2005 (25.1% hardcore poor) with substantial rural urban difference, rural poverty much higher than country average. In 2010 about 35.2% rural households lived below the upper poverty line including 21.1% hardcore poor.

BBS Household Income and Expenditure Survey 2010 showed poverty by administrative divisions. Hence, the district figures are not available. Barisal data are fairly representative of Bhola and Sirajganj should be close to Rajshahi. Magura should be close to national average while other three districts in the south of Padma should be close to Barisal division in terms of poverty although they are administratively part of Dhaka division.

**Table -3** shows incidence of poverty in the rural and urban areas by administrative division in 2000, 2005 and 2010. Percentage of people of Bangladesh living below the upper poverty line decreased from 48.9% in 2000 and 40.0% in 2005 to 31.5% in 2010. This is a substantial decrease and is on track towards achieving goal 1 of the MDG. Rural poverty too declined over the same periods in about same speed. It is important to note and should be appreciated that poverty declined faster in the northwest (Rajshahi), Khulna and Barisal divisions which had high level of poverty but the situation improved considerably. Particularly in Khulna, present rural poverty is below national average. Barisal and Rajshahi divisions are still poorer than the country as a whole but the improvement has been faster. Poverty in Sylhet is now below national average while Dhaka experienced slowest improvement. Newly created Rangpur Division still has much higher poverty than national average despite speedy decline of poverty from around 60% to present 46 percent. Chittagong division has now lowest poverty in place of Dhaka division previously.

**Table-3: Poverty by Administrative Divisions 2000, 2005 and 2010**

<table>
<thead>
<tr>
<th>Division/Region</th>
<th>All Area</th>
<th>Rural Area</th>
<th>All Area</th>
<th>Rural Area</th>
<th>All Area</th>
<th>Rural Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All Poor (2122 cal)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barisal (South)</td>
<td>53.1</td>
<td>55.1</td>
<td>52.0</td>
<td>54.1</td>
<td>39.4</td>
<td>39.2</td>
</tr>
<tr>
<td>Greater Rajshahi (Northwest)</td>
<td>56.7</td>
<td>58.5</td>
<td>51.2</td>
<td>52.3</td>
<td>35.7</td>
<td>36.6</td>
</tr>
<tr>
<td>Rajshahi excluding new Rangpur division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Rangpur Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Khulna (Southwest)</td>
<td>45.1</td>
<td>46.4</td>
<td>45.7</td>
<td>46.5</td>
<td>32.1</td>
<td>31.0</td>
</tr>
<tr>
<td>Dhaka (Central)</td>
<td>46.7</td>
<td>55.9</td>
<td>32.0</td>
<td>39.0</td>
<td>30.5</td>
<td>38.8</td>
</tr>
<tr>
<td>Chittagong (Southeast)</td>
<td>45.7</td>
<td>46.3</td>
<td>34.0</td>
<td>36.0</td>
<td>26.2</td>
<td>31.0</td>
</tr>
<tr>
<td>Sylhet (Northeast)</td>
<td>42.4</td>
<td>41.9</td>
<td>33.8</td>
<td>36.1</td>
<td>28.1</td>
<td>30.5</td>
</tr>
<tr>
<td>Country Average</td>
<td>48.9</td>
<td>52.3</td>
<td>40.0</td>
<td>43.8</td>
<td>31.5</td>
<td>35.2</td>
</tr>
<tr>
<td><strong>Hardcore Poor (1805 cal)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barisal (South)</td>
<td>34.7</td>
<td>35.9</td>
<td>35.6</td>
<td>37.2</td>
<td>21.7</td>
<td>27.3</td>
</tr>
<tr>
<td>Greater Rajshahi</td>
<td>42.7</td>
<td>43.9</td>
<td>34.5</td>
<td>35.6</td>
<td>21.6</td>
<td>22.7</td>
</tr>
<tr>
<td>Rajshahi excluding new Rangpur division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Rangpur Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Khulna (Southwest)</td>
<td>32.3</td>
<td>34.0</td>
<td>31.6</td>
<td>32.7</td>
<td>15.4</td>
<td>15.2</td>
</tr>
<tr>
<td>Dhaka (Central)</td>
<td>34.5</td>
<td>43.6</td>
<td>19.9</td>
<td>26.1</td>
<td>15.6</td>
<td>23.5</td>
</tr>
<tr>
<td>Chittagong (Southeast)</td>
<td>27.5</td>
<td>30.1</td>
<td>16.1</td>
<td>18.7</td>
<td>13.1</td>
<td>16.2</td>
</tr>
<tr>
<td>Sylhet (Northeast)</td>
<td>26.7</td>
<td>26.1</td>
<td>20.8</td>
<td>22.3</td>
<td>20.7</td>
<td>23.5</td>
</tr>
<tr>
<td>Country Average</td>
<td>34.3</td>
<td>37.9</td>
<td>25.1</td>
<td>28.6</td>
<td>17.6</td>
<td>21.1</td>
</tr>
</tbody>
</table>

Source: BBS, Household Income and Expenditure Survey 2000, 2005 and 2010
District wise breakdown of poverty data were not available in the BBS HIES 2005 and 2010 as it did not provide poverty by district. However the HIES 2005 provided data by greater district. Poverty data of the grater districts of which the proposed ARTS districts are parts are provided in Table 4 below.

Table 4: Poverty in the ARTS area by greater district 2005

<table>
<thead>
<tr>
<th>ARTS district</th>
<th>Greater district</th>
<th>HCR % below upper poverty line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sirajganj</td>
<td>Pabna</td>
<td>53.3</td>
</tr>
<tr>
<td>Magura</td>
<td>Jessore</td>
<td>51.1</td>
</tr>
<tr>
<td>Madaripur</td>
<td>Faridpur</td>
<td>40.2</td>
</tr>
<tr>
<td>Shariatpur</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gopalganj</td>
<td>Barisal</td>
<td>44.0</td>
</tr>
<tr>
<td>ARTS</td>
<td></td>
<td>40.2 to 53.3</td>
</tr>
<tr>
<td>Bangladesh</td>
<td></td>
<td>40.0</td>
</tr>
</tbody>
</table>

Table 5 below shows housing, sanitation, electricity and drinking water situation of the households in the ARTS districts which is a good indicator of assessing poverty and standard of living of the people. Tin roof house with bamboo, mud or tin wall is the norm in rural communities in all the districts which account for 81% of dwelling houses in the ARTS districts compared to country average of 85 percent. Brick wall with tin roof (semi pucca) and brick wall with cemented roof (pucca) houses symbolize affluence and over 17% households in the ARTS districts compared to 14% nationally live in such houses indicating that poverty has declined significantly. Thatched house has been almost eliminated which was very common a few decades ago.

Drinking water access is nearly universal and by this indicator also, the ARTS districts are ahead of national average. Electricity connection is low in Bhola but higher than national average in other ARTS districts. Also in terms of sanitation the ARTS districts are ahead of national average with 73% households using sanitary or ring slab toilets compared 63% nationally.

Table 5: Housing, Sanitation, Electricity and Drinking water access of the households in the ARTS districts

<table>
<thead>
<tr>
<th>SL</th>
<th>Housing Condition:</th>
<th>Sirajganj</th>
<th>Magura</th>
<th>Madaripur</th>
<th>Gopalganj</th>
<th>Shariatpur</th>
<th>Bhola</th>
<th>Project Districts</th>
<th>Country Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pucca (Brick wall, RCC roof)</td>
<td>2.3</td>
<td>5.4</td>
<td>4.7</td>
<td>4.0</td>
<td>2.8</td>
<td>1.7</td>
<td>3.5</td>
<td>4.0</td>
</tr>
<tr>
<td>2</td>
<td>Semi-pucca (Brick wall, Tin roof)</td>
<td>9.6</td>
<td>26.2</td>
<td>15.6</td>
<td>12.3</td>
<td>8.4</td>
<td>7.6</td>
<td>13.3</td>
<td>10.1</td>
</tr>
<tr>
<td>3</td>
<td>Kutcha (Mud wall bamboo fenced, tin roof)</td>
<td>87.0</td>
<td>66.9</td>
<td>78.5</td>
<td>82.7</td>
<td>87.7</td>
<td>81.3</td>
<td>80.7</td>
<td>84.5</td>
</tr>
<tr>
<td>4</td>
<td>Jhupri: Thatched house</td>
<td>1.2</td>
<td>1.5</td>
<td>1.2</td>
<td>1.0</td>
<td>1.0</td>
<td>4.5</td>
<td>1.7</td>
<td>1.4</td>
</tr>
<tr>
<td>5</td>
<td>Access safe drinking water (% HH)</td>
<td>96.8</td>
<td>97.8</td>
<td>96.8</td>
<td>96.5</td>
<td>96.1</td>
<td>96.5</td>
<td>96.8</td>
<td>95.6</td>
</tr>
<tr>
<td>6</td>
<td>Electricity (% HH)</td>
<td>47.1</td>
<td>40.8</td>
<td>59.3</td>
<td>49.1</td>
<td>43.2</td>
<td>25.9</td>
<td>44.2</td>
<td>45.6</td>
</tr>
<tr>
<td>7</td>
<td>Use Sanitary Water Sealed Toilet</td>
<td>17.9</td>
<td>42.5</td>
<td>12.6</td>
<td>44.1</td>
<td>28.7</td>
<td>9.3</td>
<td>25.9</td>
<td>62.7</td>
</tr>
<tr>
<td>8</td>
<td>Use Sanitary non-Water Sealed Toilet</td>
<td>42.8</td>
<td>35.0</td>
<td>57.6</td>
<td>41.3</td>
<td>53.3</td>
<td>50.9</td>
<td>46.8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Use Non-Sanitary Toilet</td>
<td>34.7</td>
<td>19.4</td>
<td>28.5</td>
<td>12.3</td>
<td>15.6</td>
<td>33.7</td>
<td>24.0</td>
<td>30.1</td>
</tr>
<tr>
<td>10</td>
<td>No Toilet</td>
<td>4.6</td>
<td>3.1</td>
<td>1.3</td>
<td>2.3</td>
<td>2.4</td>
<td>6.1</td>
<td>3.3</td>
<td>7.2</td>
</tr>
</tbody>
</table>

Source: BBS, Bangladesh Census of Population and Housing 2011.
All of the above indicators imply that the country as well as the ARTS districts improved considerably over the decades and the people have achieved success despite many constraints and the project will contribute to further improvement through providing better services to adopt improved agricultural practices and thus increasing income and employment opportunities.

### 3.2 Profile of the Agriculture Sector

Although the share of agriculture is decreasing over the decades, it still accounts for over one fifth of the GDP (20.3% in 2009-10) as reported in the Statistical Yearbook of Bangladesh 2011 pp 386). Crops, livestock, forestry and fisheries sub sectors contributed 11.42, 2.65, 1.73 and 4.49 percent respectively. Over the last five years, the agriculture sector grew at 4 to 5 percent yearly except in 2007-08 which was a bad year for flood and cyclone.

**Table 6** below shows that, the country has a total of 13.5 million non-farm holdings (with no farm land or below 5 decimals of farm land) and 15.2 million farm holdings which are 47 and 53 percent of all holdings. The breakdown of 53% farm holdings is 45% small and marginal farms and 8% medium to large farms. In the ARTS districts, of the about 1.9 million holdings, 39% are landless non-farm holdings and 61% are farm holdings. The 61% farm holdings comprise about 51% small and marginal farms 10% medium to large farms. As proportion of farm holdings only, 85% of the farms are small and marginal and 15% are medium to large farms.
Table 6: Number and percentage distribution of farm and non-farm holdings in the ARTS districts

<table>
<thead>
<tr>
<th>SL</th>
<th>District/Area</th>
<th>All Non-farm/landless holdings &lt;.05 acre</th>
<th>All Farm holdings &gt;=0.05 acre</th>
<th>Marginal Farms (.05-.09 acre)</th>
<th>Small farms (0.5-2.49 acres)</th>
<th>Medium farm (2.5-7.49 acres)</th>
<th>Large farms (7.5 acres and above)</th>
<th>All holdings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sirajganj</td>
<td>314,541</td>
<td>342,289</td>
<td>94,755</td>
<td>196,925</td>
<td>46,203</td>
<td>4,406</td>
<td>656,830</td>
</tr>
<tr>
<td></td>
<td>% by farm size</td>
<td>47.9</td>
<td>52.1</td>
<td>14.4</td>
<td>30.0</td>
<td>7.0</td>
<td>0.7</td>
<td>100.0</td>
</tr>
<tr>
<td>2</td>
<td>Magura</td>
<td>49,390</td>
<td>140,199</td>
<td>34,704</td>
<td>80,932</td>
<td>23,283</td>
<td>1,280</td>
<td>189,589</td>
</tr>
<tr>
<td></td>
<td>% by farm size</td>
<td>26.1</td>
<td>73.9</td>
<td>18.3</td>
<td>42.7</td>
<td>12.3</td>
<td>0.7</td>
<td>100.0</td>
</tr>
<tr>
<td>3</td>
<td>Madaripur</td>
<td>103,164</td>
<td>140,610</td>
<td>35,917</td>
<td>86,466</td>
<td>17,203</td>
<td>1,024</td>
<td>243,774</td>
</tr>
<tr>
<td></td>
<td>% by farm size</td>
<td>42.3</td>
<td>57.7</td>
<td>14.7</td>
<td>35.5</td>
<td>7.1</td>
<td>0.4</td>
<td>100.0</td>
</tr>
<tr>
<td>4</td>
<td>Shariatpur</td>
<td>76,917</td>
<td>148,607</td>
<td>46,991</td>
<td>85,561</td>
<td>15,069</td>
<td>986</td>
<td>225,524</td>
</tr>
<tr>
<td></td>
<td>% by farm size</td>
<td>34.1</td>
<td>65.9</td>
<td>20.8</td>
<td>37.9</td>
<td>6.7</td>
<td>0.4</td>
<td>100.0</td>
</tr>
<tr>
<td>5</td>
<td>Gopalganj</td>
<td>74,032</td>
<td>156,462</td>
<td>28,784</td>
<td>95,810</td>
<td>30,035</td>
<td>1,833</td>
<td>230,494</td>
</tr>
<tr>
<td></td>
<td>% by farm size</td>
<td>32.1</td>
<td>67.9</td>
<td>12.5</td>
<td>41.6</td>
<td>13.0</td>
<td>0.8</td>
<td>100.0</td>
</tr>
<tr>
<td>6</td>
<td>Bhola</td>
<td>125,084</td>
<td>222,431</td>
<td>70,223</td>
<td>119,120</td>
<td>29,799</td>
<td>3,289</td>
<td>347,515</td>
</tr>
<tr>
<td></td>
<td>% by farm size</td>
<td>36.0</td>
<td>64.0</td>
<td>20.2</td>
<td>34.3</td>
<td>8.6</td>
<td>0.9</td>
<td>100.0</td>
</tr>
<tr>
<td>7</td>
<td>Total ARTS dist</td>
<td>743,128</td>
<td>1,150,598</td>
<td>311,374</td>
<td>664,814</td>
<td>161,592</td>
<td>12,818</td>
<td>1,893,726</td>
</tr>
<tr>
<td></td>
<td>% by farm size</td>
<td>39.2</td>
<td>60.8</td>
<td>16.4</td>
<td>35.1</td>
<td>8.5</td>
<td>0.7</td>
<td>100.0</td>
</tr>
<tr>
<td>8</td>
<td>Country Total</td>
<td>13,512,580</td>
<td>15,183,182</td>
<td>4,247,673</td>
<td>8,564,699</td>
<td>2,136,415</td>
<td>234,395</td>
<td>28,695,762</td>
</tr>
<tr>
<td></td>
<td>% by farm size</td>
<td>47.1</td>
<td>52.9</td>
<td>14.8</td>
<td>29.8</td>
<td>7.4</td>
<td>0.8</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: BBS. Agriculture Census 2008, Vol- I, Table 1.
3.2.1 Land ownership and Tenancy and Type of farmers
Table 6 below shows that 95% of the farms are operated by men in the country as compared to 98% in the ARTS districts. Women are however largely involved in post-harvest work and various other farming activities as household labour as well as wage labour in the recent times. The Table 7 also shows that 56 and 57 percent farmers are owner operators in the ARTS districts and in the country and most others are owner cum tenants (41% in ARTS districts and 40% in the country). Only about 3% are tenant farmers in both areas. It happens so because the small farmers, rather than the landless are preferred by the owners as tenants. About one third of the households are engaged in agricultural wage employment in all districts which is same in the country as a whole. This may be compared to 39% non-farm holdings in the ARTS districts and 47% in the country. The difference, 6 and 14 percent landless in the ARTS districts and the country must be engaged mainly in the non-farm sectors and the 33% landless labour must also be periodically employed in the non-farm sectors.

Of the total farm area, about 90% is cultivated by owners and 10% by tenants. This is also important to note that although about 39 and 47% holdings are landless and another 15-16% marginal farmers, most (95% +) households own at least homestead area and average homestead area is 0.08 to 0.12 acres. Therefore homestead agriculture is a good area to intervene particularly to reach the landless and women.

Table- 7: Characteristics of farm and non-farm holdings

<table>
<thead>
<tr>
<th>District</th>
<th>% Male Farmer</th>
<th>% Fem farmer</th>
<th>% Owner Operator Holdings</th>
<th>% Owner Cum Tenant</th>
<th>% Tenant holdings</th>
<th>Agri-lab as % of all holdings</th>
<th>Av. Area per farm holding</th>
<th>Own-op area % percent of Farm area</th>
<th>Homestead Area per holding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sirajganj</td>
<td>98.10</td>
<td>1.90</td>
<td>54.12</td>
<td>40.65</td>
<td>5.24</td>
<td>35.76</td>
<td>1.43</td>
<td>88.92</td>
<td>0.10</td>
</tr>
<tr>
<td>Magura</td>
<td>97.96</td>
<td>2.04</td>
<td>49.12</td>
<td>49.30</td>
<td>1.58</td>
<td>32.01</td>
<td>1.50</td>
<td>93.20</td>
<td>0.08</td>
</tr>
<tr>
<td>Madaripur</td>
<td>98.05</td>
<td>1.95</td>
<td>60.11</td>
<td>38.26</td>
<td>1.63</td>
<td>33.96</td>
<td>1.33</td>
<td>94.07</td>
<td>0.12</td>
</tr>
<tr>
<td>Shariatpur</td>
<td>97.41</td>
<td>2.59</td>
<td>58.70</td>
<td>34.90</td>
<td>6.39</td>
<td>37.52</td>
<td>1.22</td>
<td>92.45</td>
<td>0.10</td>
</tr>
<tr>
<td>Gopalganj</td>
<td>98.17</td>
<td>1.83</td>
<td>55.86</td>
<td>42.76</td>
<td>1.39</td>
<td>31.15</td>
<td>1.65</td>
<td>88.6</td>
<td>0.10</td>
</tr>
<tr>
<td>Bhola</td>
<td>97.82</td>
<td>2.18</td>
<td>56.42</td>
<td>40.56</td>
<td>3.03</td>
<td>34.65</td>
<td>1.43</td>
<td>81.93</td>
<td>0.07</td>
</tr>
<tr>
<td>Total ARTS dist</td>
<td>97.92</td>
<td>2.08</td>
<td>55.72</td>
<td>41.07</td>
<td>3.21</td>
<td>34.18</td>
<td>1.43</td>
<td>89.86</td>
<td>0.10</td>
</tr>
<tr>
<td>Country Total</td>
<td>95.05</td>
<td>2.95</td>
<td>57.12</td>
<td>39.76</td>
<td>3.12</td>
<td>32.37</td>
<td>1.47</td>
<td>89.90</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Source: BBS. Agriculture Census 2008, Vol I Table 1.

Table – 8 below shows number of major agricultural equipments (non-traditional ones), excluding traditional equipments like wooden plough and bamboo yokes and hand tools like sickle. Two rows in the bottom provide information on the number of farm households sharing an equipment of various types. In the ARTS districts 30 farmers share an STW and 112 households share a power tiller.
### Table-8: Agricultural equipment (number)

<table>
<thead>
<tr>
<th>District</th>
<th>DTW Number</th>
<th>STW Number</th>
<th>LLP Number</th>
<th>Tractor number</th>
<th>Power Tiller Number</th>
<th>Thresher Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sirajganj</td>
<td>2,936</td>
<td>30,999</td>
<td>1,264</td>
<td>821</td>
<td>5,018</td>
<td>23,418</td>
</tr>
<tr>
<td>Magura</td>
<td>547</td>
<td>1,711</td>
<td>1,017</td>
<td>29</td>
<td>2,474</td>
<td>28,170</td>
</tr>
<tr>
<td>Madaripur</td>
<td>282</td>
<td>1,411</td>
<td>555</td>
<td>159</td>
<td>500</td>
<td>2,290</td>
</tr>
<tr>
<td>Shariatpur</td>
<td>216</td>
<td>575</td>
<td>482</td>
<td>143</td>
<td>395</td>
<td>1,914</td>
</tr>
<tr>
<td>Gopalganj</td>
<td>536</td>
<td>3,338</td>
<td>1,821</td>
<td>153</td>
<td>906</td>
<td>2,488</td>
</tr>
<tr>
<td>Bhola</td>
<td>381</td>
<td>104</td>
<td>1,027</td>
<td>137</td>
<td>1,014</td>
<td>1,559</td>
</tr>
<tr>
<td><strong>Total ARTS dist</strong></td>
<td><strong>4,898</strong></td>
<td><strong>38,138</strong></td>
<td><strong>6,166</strong></td>
<td><strong>1,442</strong></td>
<td><strong>10,307</strong></td>
<td><strong>59,839</strong></td>
</tr>
</tbody>
</table>

Number of farms sharing an equipment in the ARTS district: 235

Country Total: 73,353

Number of farms sharing an equipment in the country: 207

*Source: BBS. Agriculture Census 2008, Vol – I, Table 1.*

### Table-9: Land type in the ARTS districts (Area in Ha)

<table>
<thead>
<tr>
<th>Land Type</th>
<th>Sirajgonj</th>
<th>Magura</th>
<th>Madaripur</th>
<th>Shariatpur</th>
<th>Gopalganj</th>
<th>Bhola</th>
<th>ARTS districts</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. High land</td>
<td>37,000</td>
<td>15,540</td>
<td>8,625</td>
<td>6,476</td>
<td>8,715</td>
<td>50,210</td>
<td>126,566</td>
</tr>
<tr>
<td>% of area</td>
<td>20.2</td>
<td>21.3</td>
<td>7.4</td>
<td>7.5</td>
<td>8.0</td>
<td>25.4</td>
<td>16.5</td>
</tr>
<tr>
<td>b. Medium high land</td>
<td>110,845</td>
<td>37,592</td>
<td>24,575</td>
<td>30,889</td>
<td>26,189</td>
<td>120,935</td>
<td>351,025</td>
</tr>
<tr>
<td>% of area</td>
<td>60.5</td>
<td>51.5</td>
<td>21.0</td>
<td>35.7</td>
<td>24.0</td>
<td>61.1</td>
<td>45.8</td>
</tr>
<tr>
<td>c. Medium low land</td>
<td>0</td>
<td>13,289</td>
<td>34,964</td>
<td>32,139</td>
<td>37,202</td>
<td>26,713</td>
<td>144,307</td>
</tr>
<tr>
<td>% of area</td>
<td>0.0</td>
<td>18.2</td>
<td>29.9</td>
<td>37.2</td>
<td>34.1</td>
<td>13.5</td>
<td>18.8</td>
</tr>
<tr>
<td>d. Low land</td>
<td>35,375</td>
<td>6,421</td>
<td>9,206</td>
<td>11,266</td>
<td>37,012</td>
<td>60</td>
<td>99,340</td>
</tr>
<tr>
<td>% of area</td>
<td>19.3</td>
<td>8.8</td>
<td>7.9</td>
<td>13.0</td>
<td>33.9</td>
<td>0.0</td>
<td>13.0</td>
</tr>
<tr>
<td>e. Very low land</td>
<td>0</td>
<td>90</td>
<td>39,751</td>
<td>5,710</td>
<td>0</td>
<td>0</td>
<td>45,551.00</td>
</tr>
<tr>
<td>% of area</td>
<td>0.0</td>
<td>0.1</td>
<td>33.9</td>
<td>6.6</td>
<td>0.0</td>
<td>0.0</td>
<td>5.9</td>
</tr>
<tr>
<td><strong>Total cultivable land</strong></td>
<td><strong>183,220</strong></td>
<td><strong>72,932</strong></td>
<td><strong>117,121</strong></td>
<td><strong>86,480</strong></td>
<td><strong>109,118</strong></td>
<td><strong>197,918</strong></td>
<td><strong>766,789</strong></td>
</tr>
<tr>
<td>% of area</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Source: NATP, DAE*
Table 9 shows distribution of cultivable land of the ARTS districts by land elevation, high, medium, low etc. It is revealed that Bhola, Sirajganj and Magura have high proportion of high and medium land while Madaripur, Shariatpur and Gopalganj have higher proportion of medium low to very low land.

Gopalganj, Madaripur and Shariatpur are more flood-prone and have water-logging problem. Bhola and Gopalganj are also vulnerable to salinity and cyclone while Sirajganj, Madaripur, Shariatpur and Gopalganj are vulnerable to river flood. Magura has higher drought vulnerability.

Table 10 below shows distribution of the net cropped area by number of crops grown in a year. It shows that cropping intensity vary from 176 to 235 percent, lowest in Gopalganj and highest in Bhola. Average of the ARTS district is 208 compared to 185 of the country.

| Table - 10: Crop area and cropping intensity in the ARTS districts (area in ha) |
|-------------------|-----------------|-------------|---------|----------|--------|--------|
| Districts         | Sirajgonj       | Magura      | Madaripur | Shariatpur | Gopalganj | Bhola  | ARTS districts |
| a. Net cropped area | 183,220         | 69,658      | 84,370    | 86,480    | 109,118   | 192,375 | 725,221       |
| b. Single cropped area | 26,075         | 6,532       | 17,802    | 18,980    | 39,521    | 17,808  | 126,718       |
| c. Double cropped area | 110,418        | 36,348      | 53,957    | 52,080    | 54,602    | 89,844  | 397,249       |
| d. Triple cropped area, and above 3 crops | 46,727          | 26,778      | 12,311    | 15,420    | 14,995    | 84,723  | 200,954       |
| Gross cropped area | 387,092         | 159,562     | 162,649   | 169,400   | 193,710   | 451,665 | 1,524,078     |
| Cropping Intensity (%) | 211             | 237         | 194       | 196       | 176       | 235     | 208           |

Source: NATP, DAE

3.2.2 Major Crops: Crop area and Average Yield

Table 11.1 below shows area, production and yield of cereal crops in the ARTS districts as compared to country total. The six ARTS districts together produced 2.2 million metric tons cereals in 2008-09 in total crop area of 861,234 ha with average yield of 2.6 MT/ha. In terms of area HYV Boro ranks first followed by Aman HYV and Aman Local. Aus area is currently low but has potential. The study area is behind national average in terms of yield of cereal crops, 2.6 MT/ha compared to 2.8 MT/ha. Area under cereal crops in the ARTS districts and the country in 2008-09 was 861 thousand and 11.7 million ha.

Table 11.2 shows area, production and yield of jute and potato. Local potato is a major crop only in Sirajganj district while HYV potato in Sirajganj and Bhola. Jute is important in all districts except Bhola. For both crops yield is nearly equal in the ARTS area and the country. Area under jute and potato is 92,151 and 816,062 in the ARTS districts and the country respectively.

Table 11.3 shows area under other major crops like pulses, spices, oilseeds, vegetables and fruits. The BBS however did not include yield by district. Hence only area is shown in this Table. The six ARTS districts and the country had a total of 624,049 ha and 4.5 million ha area respectively. In total the six ARTS districts and the country had total cropped area of 1.2 million ha and 14.3 million ha respectively (sum of area under Tables 8.1, 8.2 and 8.3). With net cropped area of 7.7 million ha in the country and 570,000 ha in the ARTS districts the cropping intensity is estimated at 185% in the country and 211 in the ARTS districts.
Table 11.1: Area and Production of various crops in the ARTS districts 2008-09

(Area in ha and yield in MT/ha)

<table>
<thead>
<tr>
<th>Crop</th>
<th>Sirajganj</th>
<th>Magura</th>
<th>Madaripur</th>
<th>Shariatpur</th>
<th>Gopalganj</th>
<th>Bhola</th>
<th>ARTS dist</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aus Loc Area</td>
<td>484</td>
<td>1,880</td>
<td>3,440</td>
<td>11,509</td>
<td>3,998</td>
<td>46,178</td>
<td>67,489</td>
<td>375,934</td>
</tr>
<tr>
<td>Production</td>
<td>393</td>
<td>1,999</td>
<td>3,830</td>
<td>12,113</td>
<td>3,662</td>
<td>54,393</td>
<td>76,390</td>
<td>446,576</td>
</tr>
<tr>
<td>Yield</td>
<td>0.812</td>
<td>1.063</td>
<td>1.113</td>
<td>1.052</td>
<td>0.916</td>
<td>1.178</td>
<td>1.132</td>
<td>1.188</td>
</tr>
<tr>
<td>Aus HYV Area</td>
<td>3,929</td>
<td>4,166</td>
<td>14</td>
<td>121</td>
<td>95</td>
<td>20,086</td>
<td>28,411</td>
<td>689,569</td>
</tr>
<tr>
<td>Production</td>
<td>5,854</td>
<td>7,859</td>
<td>28</td>
<td>223</td>
<td>167</td>
<td>32,905</td>
<td>47,036</td>
<td>1,447,981</td>
</tr>
<tr>
<td>Yield</td>
<td>1.490</td>
<td>1.886</td>
<td>2.000</td>
<td>1.843</td>
<td>1.758</td>
<td>1.638</td>
<td>1.656</td>
<td>2.100</td>
</tr>
<tr>
<td>B.Anan A</td>
<td>14,384</td>
<td>1,647</td>
<td>24,349</td>
<td>13,316</td>
<td>23,459</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>17,156</td>
<td>2,214</td>
<td>29,400</td>
<td>15,365</td>
<td>25,274</td>
<td></td>
<td></td>
<td>461,528</td>
</tr>
<tr>
<td>Yield</td>
<td>1.193</td>
<td>1.344</td>
<td>1.207</td>
<td>1.154</td>
<td>1.077</td>
<td></td>
<td></td>
<td>1.145</td>
</tr>
<tr>
<td>T.Aman L Area</td>
<td>12,747</td>
<td>275</td>
<td>2,622</td>
<td>2,094</td>
<td>219</td>
<td>110,679</td>
<td>128,636</td>
<td>1,393,491</td>
</tr>
<tr>
<td>Production</td>
<td>21,059</td>
<td>481</td>
<td>4,061</td>
<td>2,635</td>
<td>357</td>
<td>160,282</td>
<td>188,875</td>
<td>2,077,071</td>
</tr>
<tr>
<td>Yield</td>
<td>1.652</td>
<td>1.749</td>
<td>1.549</td>
<td>1.258</td>
<td>1.630</td>
<td>1.448</td>
<td>1.468</td>
<td>1.491</td>
</tr>
<tr>
<td>HYV Aman Area</td>
<td>40,757</td>
<td>50,038</td>
<td>963</td>
<td>785</td>
<td>4,802</td>
<td>53,960</td>
<td>151,305</td>
<td>3,700,777</td>
</tr>
<tr>
<td>Production</td>
<td>93,948</td>
<td>113,542</td>
<td>2,238</td>
<td>1,148</td>
<td>11,967</td>
<td>138,914</td>
<td>361,757</td>
<td>9,074,570</td>
</tr>
<tr>
<td>Yield</td>
<td>2.305</td>
<td>2.269</td>
<td>2.324</td>
<td>1.462</td>
<td>2.492</td>
<td>2.574</td>
<td>2.391</td>
<td>2.452</td>
</tr>
<tr>
<td>Boro Loc Area</td>
<td>20,95</td>
<td>-</td>
<td>1,430</td>
<td>1,955</td>
<td>991</td>
<td>7,540</td>
<td>14,011</td>
<td>122,168</td>
</tr>
<tr>
<td>Production</td>
<td>2,854</td>
<td>-</td>
<td>4,183</td>
<td>2,999</td>
<td>1,826</td>
<td>12,748</td>
<td>24,610</td>
<td>217,544</td>
</tr>
<tr>
<td>Yield</td>
<td>1.362</td>
<td>2.925</td>
<td>1.534</td>
<td>1,843</td>
<td>1.691</td>
<td>1.756</td>
<td>1.765</td>
<td>1.781</td>
</tr>
<tr>
<td>Boro HYV Area</td>
<td>113,168</td>
<td>32,589</td>
<td>34,620</td>
<td>30,537</td>
<td>51,451</td>
<td>41,821</td>
<td>304,186</td>
<td>3,780,323</td>
</tr>
<tr>
<td>Production</td>
<td>445,206</td>
<td>120,239</td>
<td>13,605</td>
<td>126,415</td>
<td>219,066</td>
<td>154,960</td>
<td>1,079,491</td>
<td>13,866,302</td>
</tr>
<tr>
<td>Yield</td>
<td>3.934</td>
<td>3.690</td>
<td>0.393</td>
<td>4,140</td>
<td>4,258</td>
<td>3,705</td>
<td>3,549</td>
<td>3.668</td>
</tr>
<tr>
<td>Hibrid Boro A</td>
<td>19,801</td>
<td>8,582</td>
<td>5,058</td>
<td>787</td>
<td>22,056</td>
<td>50,066</td>
<td>59,800</td>
<td>813,755</td>
</tr>
<tr>
<td>Production</td>
<td>89,678</td>
<td>41,244</td>
<td>18,008</td>
<td>4,113</td>
<td>110,306</td>
<td>23,529</td>
<td>286,878</td>
<td>3,725,205</td>
</tr>
<tr>
<td>Yield</td>
<td>4,529</td>
<td>4,806</td>
<td>5,133</td>
<td>5,226</td>
<td>5,001</td>
<td>4,644</td>
<td>4,797</td>
<td>4,578</td>
</tr>
<tr>
<td>Wheat A</td>
<td>3,716</td>
<td>9,041</td>
<td>4,577</td>
<td>4,003</td>
<td>5,449</td>
<td>2,645</td>
<td>30,331</td>
<td>394,612</td>
</tr>
<tr>
<td>Production</td>
<td>6,865</td>
<td>19,913</td>
<td>8,916</td>
<td>9,471</td>
<td>12,466</td>
<td>6,167</td>
<td>63,798</td>
<td>849,046</td>
</tr>
<tr>
<td>Yield</td>
<td>3,236</td>
<td>2,841</td>
<td>1,116</td>
<td>2,643</td>
<td>3,422</td>
<td>2,028</td>
<td>2,575</td>
<td>2,755</td>
</tr>
</tbody>
</table>

Source: Yearbook of Agricultural Statistics 2009
Table 11.2: Area and Production of major non-cereal crops in the ARTS districts 2008-09
(Area in ha and yield in MT/ha)

<table>
<thead>
<tr>
<th>Crop</th>
<th>Sirajganj</th>
<th>Magura</th>
<th>Madaripur</th>
<th>Shariatpur</th>
<th>Gopalganj</th>
<th>Bhola</th>
<th>ARTS dist</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potato Loc Area</td>
<td>581</td>
<td>20</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>75</td>
<td>696</td>
<td>78255</td>
</tr>
<tr>
<td>Production MT</td>
<td>3414</td>
<td>199</td>
<td>199</td>
<td>0</td>
<td>0</td>
<td>740</td>
<td></td>
<td>561907</td>
</tr>
<tr>
<td>Yield</td>
<td>5.876</td>
<td>9.950</td>
<td>9.950</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td>9.867</td>
</tr>
<tr>
<td>Potato HYV Area</td>
<td>1793</td>
<td>97</td>
<td>275</td>
<td>455</td>
<td>346</td>
<td>2270</td>
<td>5236</td>
<td>317334</td>
</tr>
<tr>
<td>Production MT</td>
<td>11147</td>
<td>1043</td>
<td>5579</td>
<td>10067</td>
<td>5861</td>
<td>43341</td>
<td>77038</td>
<td>4706420</td>
</tr>
<tr>
<td>Jute Area</td>
<td>73.43</td>
<td>22.160</td>
<td>23.407</td>
<td>18.765</td>
<td>14.544</td>
<td>0</td>
<td>86.219</td>
<td>42.0473</td>
</tr>
<tr>
<td>Production (bale)</td>
<td>66.592</td>
<td>23.327</td>
<td>31.349</td>
<td>189.190</td>
<td>17.574</td>
<td></td>
<td>97.830</td>
<td>46.7740</td>
</tr>
<tr>
<td>All above area</td>
<td>220,798</td>
<td>130,495</td>
<td>99,225</td>
<td>85,227</td>
<td>127,410</td>
<td>290,320</td>
<td>953,475</td>
<td>12,489,823</td>
</tr>
</tbody>
</table>

Source: Yearbook of Agricultural Statistics 2009

Table 11.3. Area under other crops by district 2008
(Area in acres)

<table>
<thead>
<tr>
<th>Crop</th>
<th>Sirajganj</th>
<th>Magura</th>
<th>Madaripur</th>
<th>Shariatpur</th>
<th>Gopalganj</th>
<th>Bhola</th>
<th>ARTS districts</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulses tot</td>
<td>39,862</td>
<td>29,771</td>
<td>24,766</td>
<td>15,777</td>
<td>28,922</td>
<td>36,500</td>
<td>175,598</td>
<td>1,074,205</td>
</tr>
<tr>
<td>Oilseed Tot</td>
<td>192,171</td>
<td>20,080</td>
<td>19,849</td>
<td>14,023</td>
<td>11,278</td>
<td>18,592</td>
<td>275,993</td>
<td>1,249,006</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>5,644</td>
<td>954</td>
<td>1,830</td>
<td>1,091</td>
<td>1,305</td>
<td>421</td>
<td>11,245</td>
<td>218,320</td>
</tr>
<tr>
<td>Sweet Potato</td>
<td>964</td>
<td>151</td>
<td>355</td>
<td>722</td>
<td>91</td>
<td>6,003</td>
<td>8,286</td>
<td>103,758</td>
</tr>
<tr>
<td>Vegetables</td>
<td>8,123</td>
<td>5,837</td>
<td>2,107</td>
<td>4,141</td>
<td>2,480</td>
<td>6,142</td>
<td>28,830</td>
<td>694,253</td>
</tr>
<tr>
<td>Fruits</td>
<td>687</td>
<td>1,922</td>
<td>365</td>
<td>385</td>
<td>1,559</td>
<td>4,863</td>
<td>9,781</td>
<td>205,158</td>
</tr>
<tr>
<td>Spices</td>
<td>15,486</td>
<td>15,973</td>
<td>10,566</td>
<td>30,537</td>
<td>4,010</td>
<td>37,744</td>
<td>114,316</td>
<td>931,820</td>
</tr>
<tr>
<td>Other Crop Area</td>
<td>262,937</td>
<td>74,688</td>
<td>59,838</td>
<td>66,676</td>
<td>49,645</td>
<td>110,265</td>
<td>624,049</td>
<td>4,476,520</td>
</tr>
<tr>
<td>Area in ha</td>
<td>106,452</td>
<td>30,238</td>
<td>24,226</td>
<td>26,994</td>
<td>20,099</td>
<td>44,642</td>
<td>252,651</td>
<td>1,812,356</td>
</tr>
<tr>
<td>All crop area</td>
<td>327,250</td>
<td>160,733</td>
<td>123,451</td>
<td>112,221</td>
<td>147,509</td>
<td>334,962</td>
<td>1,206,126</td>
<td>14,302,179</td>
</tr>
</tbody>
</table>

Source: BBS, Agr Census 2008
Yield data not available by district

3.2.3 Livestock

The sub-sector’s contribution to the national GDP is 2.7% as of 2009-10. The sub-sector grew at 3.4% in 2009-10 which is however lower than growth experienced during 2001-02 to 2006-07 (4.5 to 7.2). The reasons are outbreak of disease like avian influenza for poultry and FMD for cattle and increasing price of feed and other inputs like poultry chick. This sector has good potential as the farms can be located on small pieces of land and it can be managed by the small and marginal farmers and also by the women farmers on the homestead area. Particularly the poultry and dairy have bright prospect because of higher income elasticity of the produces (poultry meat, eggs, milk and milk products). Local market of these products is quite large and is rapidly growing.
Table 12 below shows number of livestock holding and number of animals reared in each ARTS district. In the ARTS districts 709,907 holders rear 1.7 million cattle, 15,517 holders have 43,039 buffaloes, 415,649 holders have 1.0 million goats and 29,239 holders have 91,772 sheep. In the six districts about 62% farm households have cattle, 1.3% have buffaloes, 36% have goat and 2.5% have sheep. Each holder has average 2.5 cattle, 2.8 buffaloes, 2.6 goats and 3.1 sheep.

Table -12: Number of livestock holdings and number of animals in the ARTS district and the country

<table>
<thead>
<tr>
<th>District</th>
<th>Number of Livestock Holdings</th>
<th>Number of Cattle</th>
<th>Number of Buffalo holdings</th>
<th>Number of Buffalo</th>
<th>Number of Goat Holdings</th>
<th>Goat Number</th>
<th>Number of Sheep Holdings</th>
<th>Sheep number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sirajganj</td>
<td>229,173</td>
<td>599,438</td>
<td>2,449</td>
<td>7,624</td>
<td>137,396</td>
<td>360,465</td>
<td>25,537</td>
<td>71,454</td>
</tr>
<tr>
<td>Magura</td>
<td>112,218</td>
<td>273,510</td>
<td>6,542</td>
<td>21,12</td>
<td>80,853</td>
<td>207,616</td>
<td>439</td>
<td>2,168</td>
</tr>
<tr>
<td>Madaripur</td>
<td>87,599</td>
<td>187,056</td>
<td>845</td>
<td>4,739</td>
<td>49,568</td>
<td>115,733</td>
<td>476</td>
<td>2,601</td>
</tr>
<tr>
<td>Shariatpur</td>
<td>78,473</td>
<td>168,216</td>
<td>865</td>
<td>2,809</td>
<td>56,590</td>
<td>131,657</td>
<td>528</td>
<td>2,644</td>
</tr>
<tr>
<td>Gopalganj</td>
<td>98,238</td>
<td>236,964</td>
<td>436</td>
<td>1,432</td>
<td>25,957</td>
<td>64,124</td>
<td>641</td>
<td>3,045</td>
</tr>
<tr>
<td>Bhola</td>
<td>104,206</td>
<td>277,735</td>
<td>4,380</td>
<td>24,323</td>
<td>65,282</td>
<td>183,417</td>
<td>1,618</td>
<td>9,860</td>
</tr>
<tr>
<td>Total ARTS dist</td>
<td>709,907</td>
<td>1,742,919</td>
<td>15,517</td>
<td>430,039</td>
<td>415,646</td>
<td>1,063,012</td>
<td>29,239</td>
<td>91,772</td>
</tr>
<tr>
<td>% Farm HH/ av./HH ARTS</td>
<td>61.7%</td>
<td>2.5</td>
<td>1.3%</td>
<td>2.8</td>
<td>36.1%</td>
<td>2.6</td>
<td>2.5%</td>
<td>3.1</td>
</tr>
<tr>
<td>Country Total</td>
<td>8,243,681</td>
<td>21,898,410</td>
<td>141,610</td>
<td>455,046</td>
<td>4,521,634</td>
<td>12,373,559</td>
<td>282,565</td>
<td>1,296,851</td>
</tr>
<tr>
<td>% Farm HH/ av./HH BD</td>
<td>54.3%</td>
<td>2.7</td>
<td>0.9%</td>
<td>3.21</td>
<td>29.8%</td>
<td>2.7</td>
<td>1.9%</td>
<td>4.6</td>
</tr>
</tbody>
</table>

Source: BBS. Agriculture Census 2008, Vol I Table 1.

Table -13: Number of poultry holdings and number of birds

<table>
<thead>
<tr>
<th>District</th>
<th>Farm household</th>
<th>Number of Poultry Holdings</th>
<th>Poultry holder as % of FH</th>
<th>Poultry Number</th>
<th>Av poultry/holding</th>
<th>Number of Duck Holdings</th>
<th>Duck holding as % of FH</th>
<th>Duck Number</th>
<th>Av duck /holding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sirajganj</td>
<td>342,289</td>
<td>296,650</td>
<td>86.7</td>
<td>1,914,424</td>
<td>6.5</td>
<td>115,186</td>
<td>33.7</td>
<td>701,309</td>
<td>6.1</td>
</tr>
<tr>
<td>Magura</td>
<td>140,199</td>
<td>118,596</td>
<td>84.6</td>
<td>845,002</td>
<td>7.1</td>
<td>57,120</td>
<td>40.7</td>
<td>236,589</td>
<td>4.1</td>
</tr>
<tr>
<td>Madaripur</td>
<td>140,610</td>
<td>130,131</td>
<td>92.5</td>
<td>892,715</td>
<td>6.9</td>
<td>61,190</td>
<td>43.5</td>
<td>264,046</td>
<td>4.3</td>
</tr>
<tr>
<td>Shariatpur</td>
<td>148,607</td>
<td>141,782</td>
<td>95.4</td>
<td>945,354</td>
<td>6.7</td>
<td>83,649</td>
<td>56.3</td>
<td>373,597</td>
<td>4.5</td>
</tr>
<tr>
<td>Gopalganj</td>
<td>156,462</td>
<td>120,758</td>
<td>77.2</td>
<td>740,319</td>
<td>6.1</td>
<td>83,643</td>
<td>53.5</td>
<td>444,635</td>
<td>5.3</td>
</tr>
<tr>
<td>Bhola</td>
<td>222,431</td>
<td>243,014</td>
<td>109.3</td>
<td>2,291,757</td>
<td>9.4</td>
<td>194,891</td>
<td>87.6</td>
<td>1,456,237</td>
<td>7.5</td>
</tr>
<tr>
<td>ARTS dist</td>
<td>1,150,598</td>
<td>1,050,931</td>
<td>91.3</td>
<td>7,629,571</td>
<td>7.3</td>
<td>595,679</td>
<td>51.8</td>
<td>3,476,413</td>
<td>5.8</td>
</tr>
<tr>
<td>Country 15,183,182</td>
<td>14,462,063</td>
<td>95.3</td>
<td>97,810,095</td>
<td>6.8</td>
<td>7,832,415</td>
<td>51.6</td>
<td>39,432,988</td>
<td>5.0</td>
<td></td>
</tr>
</tbody>
</table>

Source: BBS. Agriculture Census 2008, Vol I Table 1.
Table 13 above shows that poultry rearing household as a ratio of farm holding is 91% in the ARTS districts and duck rearing household as % of farm household is 52 percent. Interestingly, in Bhola poultry households exceed number of farm households. It happens so, many of the poultry households are not defined farm holding as they may own below 0.05 acres land. Average poultry and duck holdings rear 7.3 and 5.8 poultry and duck respectively.

Until very recently, 100% eggs and poultry was produced in the backyard farms. This scenario has changed and now-a-days most of the rural Upazila and small towns each have a few hundred poultry farms. Many of the smaller poultry farms are operated by otherwise unemployed young men and women, many receiving short training through Government departments like Livestock Services, Youths, and Women Affairs, based at the Upazila and district. Presently, the share of farmed egg and poultry is rapidly increasing and that of backyard poultry is declining. Still, backyard poultry and duck rearing remained important and will continue to meet substantial part of egg and meat production. Backyard poultry sector is particularly important for providing cash income opportunity to the poor rural women.

Poultry farms are facing various problems now, particularly the scarcity and high price of feed, chick and other inputs. The result has been increased price of eggs and poultry meat. Government decision to import poultry chick and eggs could not reduce price in the retail market but substantial number of farms have been closed and local production declined substantially.

Use of animal power, mainly cattle and buffaloes for tillage, rural transport, mustard seed and sugarcane crushing etc. has declined tremendously over the last couple of decades. Intermediate technology like power tiller, mechanized three-wheeler vans, pedal thresher, power crusher and motorized mustard crusher (ghani) has largely replaced animal-driven traditional practices. Cattle rearing are now basically meant for producing meat and milk. Demand for these is in-exhaustive and value-addition through linkage industry has good prospect and particularly in the case of milk, it has long tradition. Besides traditional marketing arrangement, modern marketing system is already introduced and proven although serving a tiny little fraction of the millions of small producers.

Duck rearing has potential in the beel and coastal areas where substantial part of the land remains under water for about six months. Goat has one advantage that very poor households can manage it but its productivity is rather low and often conflicts with another important sub-sector, horticulture. Closed culture of goat is yet to be proven for extension to the smallholders.

Extension service remains weak for both backyard producer and smallholder commercial farmers. Larger commercial farms employ trained veterinary workers but small and backyard farmers have to depend on the public sector veterinary extension service. Although the DLS has infrastructure basically down to Upazila, quality of service and proportion of farmers reached are far below expectation and local needs. Increased manpower in the public sector is unlikely and therefore, alternative extension method- specialized service at the Upazila level and one-stop multi-purpose information centre at UP level with strong inter-agency cooperation and linkage with beneficiary organizations (CIG, PO and Local Government) must be introduced.

3.2.4 Fisheries
The fisheries sub sector experienced massive structural change over the past three decades and this trend although slowed down during the first half of the last decade; it started growing again and during 2006-07 to 2009-10 it experienced about 4.1% to 4.2% growth. Its share to GDP decreased slightly from 5.4% of 2001-02 to 4.5 in 2009-10. This is however not unexpected in the process of structural change, the industries and services growing faster than the primary sectors. The sub sector has further potential to grow as its produces have high income elasticity hence high growth of
local market is foreseen. Also it has good export market provided quality assurance to international standards.

Within fisheries sub sector, aquaculture is growing faster while the shares of both inland capture fisheries and marine fisheries sharply declined. The scope of the ARTS is however, to a great extent relevant to the aquaculture part of the sub sector, both pond aquaculture and coastal aquaculture. Conservation of inland fisheries resources through community based micro-interventions in resource management is another area of interest to target beneficiaries and deserves high priority.

Table-14 below shows relative share of inland capture, aquaculture and marine fisheries in Bangladesh in 2009-10 as compared to 1987-88. During the period share of inland capture fisheries declined from over 51% to 35.5% while the share of aquaculture more than doubled from 21% to about 47%. Share of marine fisheries also declined about 28% to 18%.

<table>
<thead>
<tr>
<th>Type of Fisheries</th>
<th>1987-88</th>
<th></th>
<th></th>
<th>2009-2010</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area (000 ha)</td>
<td>Total Catch/ Prod (000 MT)</td>
<td>Yield (kg/ha)</td>
<td>% of prod</td>
<td>Area (000 ha)</td>
<td>Total Catch/ Prod (000 MT)</td>
</tr>
<tr>
<td>Inland Capture (Rivers, Floodplains etc)</td>
<td>4,047</td>
<td>424</td>
<td>105</td>
<td>51.27</td>
<td>4,025</td>
<td>1,030</td>
</tr>
<tr>
<td>Pond</td>
<td>147</td>
<td>149</td>
<td>1,014</td>
<td>18.02</td>
<td>351</td>
<td>1,140</td>
</tr>
<tr>
<td>Baor</td>
<td>5.5</td>
<td>1.3</td>
<td>236</td>
<td>0.16</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Semi closed</td>
<td></td>
<td>22</td>
<td>47</td>
<td>2.136</td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td>Shrimp farm</td>
<td>94</td>
<td>25</td>
<td>266</td>
<td>3.02</td>
<td>246</td>
<td>156</td>
</tr>
<tr>
<td>Aquaculture Total</td>
<td>362</td>
<td>175.3</td>
<td>484</td>
<td>21.2</td>
<td>628</td>
<td>1352</td>
</tr>
<tr>
<td>Total Inland</td>
<td>4,409</td>
<td>599</td>
<td>136</td>
<td>72.47</td>
<td>4,653</td>
<td>2,382</td>
</tr>
<tr>
<td>Marine</td>
<td>228</td>
<td>27.57</td>
<td>517</td>
<td>17.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country Total</td>
<td>827</td>
<td>100</td>
<td>2,899</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Table 15 below shows production of fish from capture as well as from culture in the ARTS districts and the country as a whole. River catch is highest in Bholo and beel (floodplain) catch highest in Gopanganj among the ARTS districts. Aquaculture appeared prominently in all ARTS districts and in all, the yield is low, from 1.0 MT/ha to 1.2 MT/ha compared to national average of 1.3 MT which is also very low. The concerned extension agency officials felt that yield can be increased to about 3.0 MT/ha. Bagda farming is found in Gopalganj only while Golda too is found mainly in Gopalganj. Aquaculture as a whole appeared prominently in three districts- Bholo, Gopalganj and Sirajganj.
Table 15: Inland Capture Fisheries and Aquaculture Production in the ARTS Districts 2009-10

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Sirajganj</th>
<th>Magura</th>
<th>Madaripur</th>
<th>Sariatpur</th>
<th>Gopalganj</th>
<th>Bhola</th>
<th>ARTS</th>
<th>Country Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capture</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rivers catch</td>
<td>407</td>
<td>216</td>
<td>714</td>
<td>1,179</td>
<td>588</td>
<td>21,477</td>
<td>24,581</td>
<td>141,148</td>
</tr>
<tr>
<td>Beel catch</td>
<td>555</td>
<td>205</td>
<td>1,162</td>
<td>47</td>
<td>4,555</td>
<td>2</td>
<td>6,526</td>
<td>79,209</td>
</tr>
<tr>
<td>Sub Total</td>
<td>962</td>
<td>421</td>
<td>1,876</td>
<td>1,226</td>
<td>5,143</td>
<td>21,479</td>
<td>31,107</td>
<td>220,357</td>
</tr>
<tr>
<td>Aquaculture</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pond area acre</td>
<td>4,191</td>
<td>2,714</td>
<td>2,196</td>
<td>3,119</td>
<td>7,227</td>
<td>6,905</td>
<td>26,352</td>
<td>350,595</td>
</tr>
<tr>
<td>Production</td>
<td>11,753</td>
<td>8,672</td>
<td>5,490</td>
<td>7,705</td>
<td>20,426</td>
<td>21,270</td>
<td>75,316</td>
<td>1,140,485</td>
</tr>
<tr>
<td>Yield MT/ha</td>
<td>1.135</td>
<td>1.294</td>
<td>1.012</td>
<td>1.000</td>
<td>1.144</td>
<td>1.247</td>
<td>1.157</td>
<td>1.317</td>
</tr>
<tr>
<td>Shrimp area acre</td>
<td>38</td>
<td>132</td>
<td>1,116</td>
<td>276</td>
<td>1,562</td>
<td>246,199</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prod Bagda</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prod Golda</td>
<td>10</td>
<td>37</td>
<td>1,049</td>
<td></td>
<td>1,096</td>
<td>30,636</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prod Others</td>
<td>9</td>
<td>13</td>
<td>169</td>
<td></td>
<td>192</td>
<td>82,076</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub Tot area acre</td>
<td>4,191</td>
<td>2,752</td>
<td>2,328</td>
<td>3,119</td>
<td>8,343</td>
<td>7,181</td>
<td>27,914</td>
<td>596,794</td>
</tr>
<tr>
<td>Sub Tot Prod</td>
<td>-</td>
<td>19</td>
<td>50</td>
<td>-</td>
<td>1,218</td>
<td>-</td>
<td>1,288</td>
<td>155,866</td>
</tr>
<tr>
<td>Total Prod aquaculture</td>
<td>11,753</td>
<td>8,691</td>
<td>5,540</td>
<td>7,705</td>
<td>21,644</td>
<td>21,270</td>
<td>76,604</td>
<td>1,296,351</td>
</tr>
<tr>
<td>TOTAL Inland prod</td>
<td>12,715</td>
<td>9,112</td>
<td>7,416</td>
<td>8,931</td>
<td>26,787</td>
<td>42,749</td>
<td>107,711</td>
<td>1,516,708</td>
</tr>
<tr>
<td>MARINE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td>517,282</td>
<td></td>
</tr>
<tr>
<td>G. TOTAL</td>
<td>12,715</td>
<td>9,112</td>
<td>7,416</td>
<td>8,931</td>
<td>26,787</td>
<td>42,749</td>
<td>107,711</td>
<td>2,033,990</td>
</tr>
</tbody>
</table>

Source: Catch Assessment Survey of the DOF published in the BBS Statistical Yearbook 2011 pp 150-154

3.2.5 Present condition of the agricultural extension systems

The extension agencies have varying institutional facilities and field presence in the NRTS districts. The DAE has Sub Assistant Agriculture Officers in the grassroots level, average three officers in each Union Parishad. However in the remote areas of the ARTS districts many positions are vacant and for not having office in the UP level, the “officers” are rarely found in the UP or village level “except when there is specific programme”. In the UPs having newly constructed UP Complex, the DAE is provided an office room and in the NATP areas the project has established FIAC in the UP level. The DLS and DoF do not have any staff in the UP level. Hence they have engaged Local Extension Agent in Fisheries (LEAF) and Community Extension Agent in Livestock (CEAL) to provide extension service in the village level in the NATP area while the office is located everywhere in the Upazila level.

The DAE has established farmer groups throughout the country initially aiming to popularize organic methods of pest control called Integrated Pest Management through the IPM Clubs. The IPM Clubs are used to disseminate improved farming practices in the village level and to organize
demonstration etc. In the districts with project support (like Danida), the DAE has widened the scope of IPM to ICM (Integrated Crop Management). It was found in Sirajganj during field visit. In Greater Noakhali district and Barisal division, Danida has introduced Farmer Field School (Groups of 25 men or women farmers meeting every fortnight to discuss, learn and apply improved farming practices) as an extension approach and this has achieved considerable success. CEAL and LEAF are now promoted by the NATP and is likely to be further expanded and fine-tuned under the ARTS. The field presence has improved such as in Sirajganj after establishing the ICM but the sustainability remains a concern after closing the project.

3.3 Present Scenario of the Four Villages in the ARTS district Sirajganj

As part of this social assessment, the social and environment consultants accompanied by the district and Upazila level GoB officials visited a total of four villages in December 2012 in two Upazilas of Sirajganj districts. The Social consultant visited three more districts (Madaripur, Gopalganj and Magura) with the Pre-Appraisal Mission in November 2012 and obtained relevant field level information of the remaining two districts (Shariatpur and Bhola) from the relevant extension agencies.

Information in each of the four villages was obtained by FGD with four groups of farmers who are members of currently functional Integrated Crop Management Clubs (ICM) organized by the DAE or have attended training on crop production, aquaculture and IPM in the recent past. Each ICM comprises 25 male members and 25 female members. The male members are crop farmers and the female members are engaged mainly in cattle rearing, vegetables and fruits growing in the homestead land.

In each ICM location about 30 to 40 men and women farmers turned up as officers from the districts and consultants from the World Bank came to the village. Conducting FGD with such large group was difficult. Therefore, the team held a brief introductory meeting and learnt about the economic activities in which the male and female ICM members are engaged and then from the large group, the social consultant asked some of the members to discuss with him and other with the environmental consultant. About ten members set with the social consultant to keep the group size small.

Salient Features of the villages

Village 1:
In Belkuchi Upazila of Sirajganj district one of the villages where the FGD was conducted is Dhul Ghagrakhali of Daulatpur UP. The discussion was limited to one hamlet, not the whole village so that the informants can provide precise information. The hamlet, Dhul Ghagrakathi Poschim Para has about 65 households, about 10% female-headed. About 70% of the population is Muslim and remaining 30% Hindu. The village has mainly three occupation groups, farmers, weavers and day labour. Each household has mixed occupation, farming, weaving and some poorer ones day labouring/ rickshaw van driving.

Economically, as well as socially, the village is not very poor. Almost 100% households have one or more cell phones, 60% have electricity, 30% have TV, 80% have own tube wells (others fetch water from the neighbour’s house without any difficulty) and 80% have sanitary or ring-slab latrine. Source of cooking fuel is jute stick, fuel wood, tree leaves and cow-dung mostly from own farm. In the past, the poor used to collect cow-dung from the grazing land but this is now rare. Jute stick comes either from own farm or from employer farmer for working in post-harvest work of jute. The village is not very poor as revealed from the fact that 60% of the Muslim households were able to sacrifice cattle...
during Eid (one cattle by one to seven households in share) and 40% of the Hindu households were able to contribute money to the temple during the last durga festival.

In terms of landholding, about 15% do not own homestead land (they live on public land or relative’s land) and another 40% are landless. Only 11% are medium to large farmers and the remaining 24% are small and marginal farmers. As for tenancy, about 20% are sharecroppers and 80% are owner cultivators or owner cum tenant. Poverty is lower than landlessness because many of the landless are weaving labour having regular employment earning Tk. 200/day and wage rate of agricultural labour has increased a lot, now 150-200 in the slack season and 300 in the peak season plus lunch.

Irrigation: The village has no DTW and no LLP but 12 STW. Each STW irrigates about 5.00 acres of 2.0 ha land. The farmers in the village should be cultivating about 100 acres or 40 ha land of which 30 ha should be under HYV or hybrid boro. To irrigate the 30 ha area a few extra STW are needed and for that the farmers buy irrigation service on payment of 25% paddy. Supplementary irrigation is provided to Aman paddy once or twice in a season.

Major crops grown are: Hybrid boro in 25% area, HYV boro in 55% area, wheat in 10% area, mustard in 80% area, aman 80% area and jute in 25% area. This makes cropping intensity about 275 percent. Yield of crops are: Boro HYV (BR 28) 800 kg, BR 29 Boro 1,000 kg, hybrid boro 1,200 kg, Aman (BR 11) 600 kg, Wheat 400 kg, mustard 150 kg and jute 600 kg per bigha (each bigha 33 decimals).

Livestock: About 30% households have milking cow (av. 2 per farmer milk yield 5 lit/day), 25% have cattle fattening (4 month per year, av one bull per farmer, av profit 3000 per bull), 10% rear goat (goat rearing low as it damages crops/ small trees), 50% have sheep, nearly 100% have backyard poultry, 10% have duck and there is just one poultry farm rearing 600 chicks, every two months cycle, av meat 1 kg per broiler).

Aquaculture: The village has only about 10 ponds, av pond size one bigha, av yield 240 kg/bigha (1.8 MT/ha), av. Fish price quite high, Tk. 150/kg.

Access to extension service is high for having ICM Club. Danida is now supporting ICM but the project is likely to be closed this year. Under the ICM, two demonstrations were organized on wheat cultivation. As for inputs, only about 10% of the seed comes from the BADC and most farmers buy seed from open market. For hybrid, seed is purchased from the company dealers, for HYV the seed is purchased from other farmers either in the village or from the market. It is desired that HYV seed must be replaced every three years but it cannot be ensured that older seeds are not sold by the dealers or traders. Seed producing farmers with linkage to BADC and extension agencies is rare. About access to quality fertilizer, it was told that Urea quality is good as 100% production comes from the public sector operated industries. But for the TSP, MP and Zink fertilizers the quality is often questioned and further that the dealers cheat farmers in weight, 50 kg bag contains actually 48 kgs.

Use of green manure is limited. The bulk of the cow-dung is used as fuel, poultry litter is of limited supply and compost making is rarely practiced. This has caused reduced use of green manure leading to decline of soil fertility. Use of chemical fertilizer is becoming balanced gradually due to deliberate policy of increasing price of urea fertilizer by reducing subsidy.

Government provides subsidy on electricity used in the irrigation pump by 20 percent and this accrues to pump owner, rather than to the farmers as the pump owner charges usual rate on water.
Government provided diesel subsidy twice in 2010 and that was given directly to the farmers. In the last two years no such subsidy was provided.

**Landholding of the ICM members and leaders:** The composition of the ICM club is mixed, comprising all categories of farmers. But it deliberately avoided including the sharecroppers as “they may not stay in farming permanently”. Only two of the 50 are sharecroppers. Proportionate representation would require 10. The leaders are from the rich farm households, the president is a large holder and the Secretary is a small farmer. Three of the nine EC members are women and one of them is daughter in law of the ICM president, which is not unusual in the rural society. Another one was a candidate in UP election who spent Tk. 350,000 in election but could not win due to power politics.

**Village 2:**
Char Jhau Dokkhin Para, UP Jhau, UP Kamarkhand, district Sirajganj.
In this part of the village 55 households live of which 10% are female-headed and all are Muslims. Main occupations are weaving, crop agriculture, cow rearing, cattle fattening and day labouring. The village and the surrounding have enough work hence neither male nor female workers go out of the area for seasonal work.

About 80% households use electricity, similar percentage of people have sanitary or ring slab latrine and all have access to safe drinking water from Tube Well. Ground water quality of Sirajganj is very good.

About 15% households do not own homestead land and another 20% do not own cultivable land. The remaining 65% are all mostly marginal farmers and a few are small farmers. There are no medium and large farmers. All children are enrolled to school but 20% are dropped out before completing primary education.

Major crops are mustard, HYV and hybrid Boro, Jute and mustard. This part of the village has four STW, no DTW and no LLP. The households living in this part of the village own about 20 acres (60 bigha) land and the whole area is irrigated by the STW, each STW irrigating average 15 bigha or five acres. Supplementary irrigation is provided in about 20% of the area in aman season. Spraying in mango tree introduced in the recent years, now covering only about 10% of the trees and it is likely to expand as yield is more than doubled just for two spraying spending about Tk. 1000-2000 per bigha or 200-400 per tree.

**Livestock:** About 40% households rear milking cow (average one cow and av milk yield 1.5 litres as the cows are of local variety), about 80% households rear, av one or two bulls per household for a duration of three-four months targeting Eid market. Only about 10% households rear goat, nearly 100% rear poultry and 50% rear duck. There is no poultry farm in this part of the village.

**Aquaculture:** There is no fisher in this part of the village but has 10 small ponds and three large ponds. The large ponds are of one to two bigha in size while small ponds are only 5 to 10 decimals. Aquaculture is practiced in the large ponds for both household consumption and marketing. Yield is 200 kg/ha and price of fish is Tk. 130-150/kg. In the small ponds some fries are stocked and fish produced is mainly consumed by the households.

**Extension service:** Farmers consult the Sub Assistant Agriculture of the DAE to get advice on crop farming and horticulture. The result of extension advice is more balanced use of fertilizer. The DoF is however constrained to provide extension service to pond owners and for veterinary service farmers approach DLS office and calls veterinarian by cell phone. They also avail service of village doctor for veterinary service rather than taking trouble to consult DLS veterinarian in the Upazila. It
was learnt that farmers now use the cell phone to call extension officers of both DAE and DLS which has improved communication between farmer and extension service. Twenty five farmers have opened ten taka bank account in 2010 when government paid Tk. 800 and Tk. 200 as diesel subsidy. The money was transferred to the farmers’ bank account who received water from diesel operated pumps. Farmers use power tiller and irrigation pump. In addition to these, the farmers use power thresher for threshing paddy.

**Problems in agriculture:** The farmers said that the main problem in crop agriculture is inadequate supply of power tiller. The tillers are inadequate to cultivate all land in time. Tillage cannot always be completed before expiry of the early season of planting or sowing. This delays cultivation and reduces yield. Another problem is low price of crops but high cost of labour and irrigation charge. Main problem in livestock is low access to preventive and curative veterinary service and poor quality of fish fry.

**Village 3:**
Megula, Belkuchi Upazila:
A group of 35 women were met at village Megula, Belkuchi Upazila. Of the 35 women, 25 are members of ICM club. Two of the 35 are widows and two are divorced. All live on public land but they have secure occupancy right and effectively they live like owner of the land. On the public land, they built house, planted trees and have home based farming activities including vegetables, poultry, cow rearing and cattle fattening.

Seven of the 35 own some cultivable land, each only about one bigha. A total of eight are sharecroppers. Two of the 35 rear cow, two have cattle fattening round the year and all 35 get engaged in seasonal cattle fattening for 3-4 months before Eid festival. Ten of the 35 rear goat, only about five rear poultry but none rear duck as duck get lost by swimming away during the flood season.

Husband and other male members are engaged in weaving (about 75%) and driving rickshaw van (25%) in addition to agriculture. Women are engaged in livestock rearing, fruits and vegetables cultivation. Women cut grass for the cattle, feed them and care them. Besides straw and grass, cattle are fed rice and wheat bran, molasses etc.

DLS provides vaccination and de-worming medicine. The SAAO provides advice on management practice for both crop and livestock but fisheries extension service remains weak. DoF sometimes visit pond, advises to use lime and farm management. The DLS provides Artificial Insemination and calf quality is good. Improved cow gives 5-7 litre milk per day while local cow gives one or two litres milk. DAE advises to use green manure and not to burn cow-dung for cooking.

**Village 4:**
Village Bharenga Purba Para, UP Jhaul, Upazila Kamarhkand, Sirajganj
A group of seven farmers were met on the way back to Dhaka. The East Para of the village has about 150 households. It has no ICM club now but some training held in another part of the village, west para. The Agriculture Officer from the Upazila and the SAAO organized the training. They taught about IPM, better practice of planting paddy saplings and the use of guti urea etc. Number of trainee was 25 including ten women. Of the ten women, five are distressed women.

The village has one DTW from the BADC which covered 100 acres area before but now only 33 acres as other areas now covered by the STWs. The village has many STWs irrigating almost the whole area.
Farmers in the village spray in the mango tree. The technology was disseminated by the NGO NDP in the area. One SAAO from the DAE comes to the village from time to time and farmers call him when some advice is needed. For veterinary service, the farmers usually call a village doctor who sits in the nearby market. It is cheaper and more convenient to the farmer to call the village doctor rather than going to the Upazila Veterinary Surgeon to treatment of livestock. The AI service too is available from the village doctor.

The DoF extension service is poorer as they have no field staff. Training on aquaculture was held in the area about 8-10 years ago. Number of participants was 15-20. Farmers ask the fish fry trader how to culture fish and the fry trader provides necessary advice. Vaccination programme of livestock is particularly poor.
4. Stakeholder Analysis

The stakeholder analysis presented here has been conducted to

- Identify various stakeholder groups having varying interest
- Describe their profile and characteristics and the nature of their agenda or interest in the project
- Gauge their influence in the project – their intention, capacity and likelihood to influence the project
- Understand specific issues, concerns as well as expectations from the project
- Identify conflict of interests between stakeholders in order to help managing such conflicts in the course of project execution
- Assess capacity of various stakeholder groups to participate and help improving participation particularly of the weaker groups
- Assess the appropriate type of participation by various stakeholder groups at various stages of project cycle.

The Stakeholder Groups

The ARTS involves a wide range of stakeholders in the primary (Village community, UP and Upazila – the farmers, fishers, landless, women, community based organization, local government bodies etc.), secondary (Government Organizations in the Upazila, district and regional level, local Civil Society Organization/ local NGOs etc.) and tertiary (national level GoB agencies, national NGOs, International NGOs, Universities, Research Organizations, Consultants, International Agencies etc.) levels.

Table 16 below provides a list of Stakeholders along with their basic characteristics and other relevant information.
<table>
<thead>
<tr>
<th>Stakeholder Category</th>
<th>Relevant Stakeholders</th>
<th>Profile/Characteristics</th>
<th>Expectations</th>
<th>Key Concerns</th>
<th>Ability to Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government of Bangladesh</td>
<td>Ministry of Agriculture</td>
<td>Headed by Minister but effectively administered by the bureaucracy.</td>
<td>Policy direction, implementation supervision, Ensure allocation and release of fund.</td>
<td>Administration, Control mechanism, audit compliance so that there is no audit objection</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Ministry of Fisheries and Livestock</td>
<td>Like above</td>
<td>Like above</td>
<td>Like above</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Ministry of Planning (Planning Commission)</td>
<td>Like above</td>
<td>Approve project, allocate fund in the ADP</td>
<td>Maintaining planning discipline</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Ministry of Finance</td>
<td>Like above</td>
<td>Approve financial allocation, release fund.</td>
<td>Expenditure control, financial discipline</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Economic Relations Division</td>
<td>Like above</td>
<td>Negotiation with the development partners</td>
<td>Agreements honoured, meeting the requirements of both GoB and development partners</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Department of Agriculture Extension</td>
<td>Technical Department but most often effort spent in administration, field level support inadequate</td>
<td>Propose specific activities, execute project, propose fund allocation, act as liaison between the field implementation and the ministry</td>
<td>Political and administrative control affects implementation</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Department of Livestock Services</td>
<td>Like above</td>
<td>Like Above</td>
<td>Like above</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Department of Fisheries</td>
<td>Like above</td>
<td>Like Above</td>
<td>Like above</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Bangladesh Agriculture Development Corporation</td>
<td>Autonomous in name but actually controlled by the ministry</td>
<td>Supplies inputs under contract</td>
<td>Limited resources and inability to meet demand</td>
<td>Low</td>
</tr>
<tr>
<td>Phase</td>
<td>Player</td>
<td>Authority</td>
<td>Activities</td>
<td>Implementation</td>
<td>Impact</td>
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<tr>
<td>HORTEX Foundation</td>
<td>Autonomous, functions under the MOA</td>
<td>Propose specific activities, execute project, propose fund allocation, act as liaison between the field implementation and the ministry</td>
<td>Political and administrative control affects implementation</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Agricultural Research Institutes</td>
<td>Apex body in the NARS</td>
<td>Coordination in research. Research Extension Linkage</td>
<td>Agree on research priorities and link fund flows</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Bangladesh Agriculture Research Institutes</td>
<td>Leading public sector ARI for all crops except rice, jute, sugarcane</td>
<td>Conduct research, release varieties, technologies</td>
<td>Technology developed suits local conditions, result scientifically valid</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Bangladesh Rice Research Institute</td>
<td>Leading public sector ARI for rice</td>
<td>Conduct research, release varieties, technologies</td>
<td>Like above</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Bangladesh Fisheries Research Institute</td>
<td>Research in fish, shrimp, prawn</td>
<td>Conduct research, release varieties, technologies</td>
<td>Like above</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Bangladesh Livestock Research Institute</td>
<td>Research in livestock and poultry</td>
<td>Conduct research, release varieties, technologies</td>
<td>Like above</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Local Government</td>
<td>Elected local government but has limited financial and administrative authority</td>
<td>More resources received from the project</td>
<td>Implementation oversight</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Union Parishad</td>
<td>Elected grassroots local government but has limited financial and administrative authority</td>
<td>More resources received from the project</td>
<td>Involvement in the implementation process, select beneficiaries</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Community Based Organizations</td>
<td>Farmer Organizations</td>
<td>Participate in project activities</td>
<td>Appropriate technology made available to farmer groups, extension service easily accessed, DAE/DLS/DoF staff meet farmer groups regularly</td>
<td>Supply of quality inputs, Training, Demonstration etc. Organizational sustainability</td>
<td>Medium</td>
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<td>--------------------------------</td>
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</tr>
<tr>
<td>IPM/ ICM Club, NATP Type CIG, Danida Type FFS</td>
<td>Community Based Organizations</td>
<td>Participate in project activities</td>
<td>Appropriate technology made available to farmer groups, extension service easily accessed, DAE/DLS/DoF staff meet farmer groups regularly</td>
<td>Supply of quality inputs, Training, Demonstration etc. Organizational sustainability</td>
<td>Medium</td>
</tr>
<tr>
<td>Irrigation Groups – Water Management Associations</td>
<td>Groups either to be newly formed or re-activated</td>
<td>Water management infrastructure improved, repaired, renovated</td>
<td>Organization management skills, equitable distribution of benefits and cost sharing</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Farmers</td>
<td>Crop Farmers</td>
<td>Usually do not have active organization</td>
<td>Appropriate technology made available to farmer groups, extension service easily accessed, DAE staff meet farmer groups regularly</td>
<td>Supply of quality inputs, Training, Demonstration etc.</td>
<td>Low</td>
</tr>
<tr>
<td>Shrimp, Prawn and Fish Farmers</td>
<td>Usually do not have active organization</td>
<td>Appropriate technology made available to farmer groups, extension service easily accessed, DoF staff meet farmer groups regularly</td>
<td>Supply of quality inputs, Training, Demonstration etc. Allocation of khas jolmohal Effective water management</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Landless and Women</td>
<td>Usually do not have active organization</td>
<td>Training, inputs marketing support</td>
<td>Exclusion and elite-capture of the CIGs/ POs</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Small/ Marginal Farmers</td>
<td>Usually do not have active organization</td>
<td>Appropriate technology made available to farmer groups, extension service easily accessed, DAE</td>
<td>Supply of quality inputs, Training, Demonstration etc.</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>Subcategory</td>
<td>Description</td>
<td>Priority</td>
<td>Code</td>
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<td>--------------------------------</td>
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<tr>
<td>Farmers</td>
<td>Medium to Large Farmers</td>
<td>Usually does not have active organization but has a tendency to capture leadership of farmer groups</td>
<td>Leadership, honour, input support</td>
<td>Low priority in the project</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Livestock Farmers – dairy, cattle fattening, goat rearing farmers</td>
<td>Usually do not have active organization</td>
<td>Appropriate technology made available to farmer groups, extension service easily accessed, DLS staff meet farmer groups regularly</td>
<td>Limited veterinary care, vaccination, medicine, feed</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Commercial Poultry Farmers</td>
<td>Have organization but not very active</td>
<td>Appropriate technology made available to farmer groups, DLS staff meet farmer groups regularly</td>
<td>Quality chick, feed, medicine, vaccine</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Backyard poultry and duck farmers</td>
<td>Usually do not have active organization</td>
<td>Appropriate technology made available to farmer groups, DLS staff meet farmer groups regularly</td>
<td>Lack of support for vaccination</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Home based kitchen gardening, horticulture farmers</td>
<td>Usually do not have active organization</td>
<td>Appropriate technology made available to farmer groups, DAE staff meet farmer groups regularly</td>
<td>Quality seed, training, IPM, fertilizer, pesticide</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>Often are members of MFIs, NGO groups</td>
<td>Appropriate technology made available to farmer groups</td>
<td>Quality seed of vegetables, vaccination for poultry, goat, training, IPM</td>
<td>Low</td>
</tr>
<tr>
<td>Category</td>
<td>Type</td>
<td>Description</td>
<td>Risk Level</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Tribal people/Ethnic Minority</td>
<td>Only about 0.2% of the population are Tribal or ethnic minority people.</td>
<td>Appropriate technology, extension staff meets farmer groups regularly.</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Sector</td>
<td>Seed Companies</td>
<td>Import, production multiplication and marketing of seed. Have control on market &amp; price</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fertilizer and Pesticide Dealers</td>
<td>Have strong influence in local politics and good link to bureaucracy</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Community</td>
<td>World Bank/FAO/US Aid</td>
<td>Administers grants and provide technical support to the Project</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Project benefits the target people</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Compliance of the relevant safeguard policies</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
5. Social Issues

The ARTS aims to increase productivity of agriculture in all three sub sectors – crops, fisheries and livestock and in supply chain development in the selected ecologically constrained and underserved areas of the country where most inhabitants are landless, small and marginal farmers. The project is expected to improve food security, nutritional status and general welfare of the project area people, particularly of the target groups, though increased productivity, enhanced employment opportunity and income. The project is unlikely to affect any social group adversely through any of its activities but several social issues must be considered to ensure that the project benefits accrue to the target people and no social group is adversely affected.

This section analyses various social issues likely to affect project implementation and its outcome, positively or negatively in the three main project components – agricultural research support, technology adoption and supply chain development. This is needed because, reaching the service to the farmers in general and the small, marginal and women farmers as well as to tribal people is a difficult task in the prevailing socio-political conditions.

Several of the issues are of general nature and are relevant to all components while some others are more relevant to specific components. This section provides an overview of both general and specific issues along with the probable impacts followed by a matrix analyzing the social issues in Table 18.

5.1 General Issues

a. Inequality

The country as well as the rural economy experienced considerable economic growth but it has been accompanied by increasing inequality. National gini-coefficient measuring inequality increased from 0.451 in 2000 to 0.467 in 2005. Slight improvement was mentioned in the SFYP stating that the gini-coefficient decreased to 0.458 in 2010 but still higher than that of 2000. The SFYP acknowledged the problem of inequality and pledged to address it during the plan period 2011-15. Income inequality is lower in the rural areas than in the urban areas because rural rich are not very rich and not many in number to distort income distribution pattern.

The traditional low intensive agriculture in the lower stage of development is less dependent on external inputs like chemical fertilizer, modern seeds and equipment. It is therefore poor-friendly and poorer farmers can participate in and benefit from it. It is revealed from the discussion in the community level that, farmers used to preserve own seeds and it was almost free of cost or could be purchased from the neighbouring farmers at low cost. Now, farmers have to buy hybrid seed afresh every season and for HYVs every two to three years to maintain yield. Cost increase reduces poorer farmers’ capacity to accept new technology. Still, new technologies like hybrid and HYV of crops, fish species, animals and poultry are flourishing to feed the growing population with outputs from limited areas of land. Intensification is therefore inevitable and new technological interventions begun in Bangladesh agriculture since 1960s. This has helped increasing productivity, particularly of rice, potato, fish and poultry mainly through introduction of modern varieties of seeds,
agrichemicals (fertilizer, pesticide), modern equipment (mechanized irrigation, thresher, tiller etc.). This development has helped Bangladesh achieving near self-sufficiency in rice and considerable crop diversification and rapid expansion of aquaculture. But this has been accompanied with some degree of inequality.

Intensification helped benefiting the landowners and enterprising farmers more than the landless. The landless and land poor have also been benefited through increased wage rate and work opportunities. But those without active male labour force remained excluded to a great extent because many agricultural works outside of homestead area still employ mainly male labour rather than female labour. This is a social barrier and is changing now and the rapidly growing intermediate technology in farm mechanization is increasing employment of both male and female labour. Example is increased use of power tiller and irrigation pump employing male labour as driver and mechanics but the same engine used for threshing is employing female labour winnowing crops. Besides, the use of power tiller engine in husking machine reduced workload of women giving them opportunity to devote more time in childcare and various productive activities like poultry and other home based agriculture. So, there are instances that technology not necessarily displaces labour. It can benefit all, including landless and women, although not equitably.

Selection of technology is therefore very important. If hybrid and HYV have to be accepted, it must be ensured that farmers have access to public sector agencies like BADC for seed and other inputs at low cost and of good quality and timely delivery is also ensured. Here seed means not only crop seeds, but also frozen semen for livestock, poultry chick and fish fry etc. Besides seed, ensuring the supply of quality inputs like fertilizer, animal feed, vaccination, veterinary care and field inspection or at least presence of technically competent extension personnel in the FIAC is very important.

The farmer groups like CIG and farmer organizations like the POs to be developed and promoted under the project must ensure that they include small and marginal farmers, woman farmers everywhere and tribal community farmers where applicable.

b. Inclusion of sharecropper and tenant farmers
Theoretically, labour saving technology and increasing profitability per unit area of land encourage landowners managing own land rather than sharecropping or leasing out, while traditional technology favours engaging sharecroppers. Sharecropping has been a traditional mode of production in Bangladesh and it helped many of the landless and land-poor households to participate in farming. This opportunity is shrinking as more and more farmers started cultivating nearly the whole of the agricultural area, and virtually no farmers have excess land to lease out. Presently the absentee owners have to lease out or engage sharecroppers but this opportunity is availed only or mostly by the kin members of the same extended family rather than otherwise competent and efficient landless farmers.

Displacement of sharecropper is viewed negatively in the rural communities as it changes social status of the affected households from share cropper, borga chasi to day labour, din majur. Borga chasi is socially better respected than din majur even if a din majur might earn higher than a borga chasi.
Sharecropper displacement has been evident from the Agriculture Census data 2008 that only about 3% of the holdings both nationally and in the ARTS districts are tenant operated 40% and 41% respectively owner cum tenant operated and 57% and 58% respectively owner operated. On the whole, about 80% area was cultivated by the owners and 20% by tenants. In a field work in four villages in the IAPP districts in 2011, it was found that about 20% farmers were non-owner tenants, 19% owner cum tenants and overwhelming majority, 61% owner operator farmers. The difference between census and field survey data is important. In reality, probably, 20% or so farmers are tenant farmers and another 20% or so owner cum tenant farmers and the land for sharecropping possibly belong mostly to the absentee owners who live in the urban areas and are engaged in non-agricultural occupations.

Although, sharecropping might be decreasing but opportunities for fixed-rent tenancy should be increasing because of growing number of absentee owners, not necessarily rich but have migrated to urban areas for employment. In a field work in the four villages of Sirajganj district in December 2012, it was found that about 20% of the farmers are sharecroppers, the remaining 80% mainly owner operator including about 20% owner cum tenants.

Increasing wage rate in the recent years and cost of inputs may encourage absentee owners in particular to lease out land on fixed rent arrangement and resident non-farmers to lease out on sharecropping terms.

The issue here is that the sharecropper and fixed rent tenant farmers may feel unimportant to join CIGs and accept new technology for the temporary nature of farming as non-owner. Also, the extension agencies may face difficulties to trace them hence such farmers are often not included in the farmer groups. But such farmers do continue in farming cultivating land from the same or different owners over long period. They must be hardworking and enterprising but may lack access to extension agencies. It is easier for the extension agency workers to reach affluent farmers rather than the poor farmers and tenants. The ARTS, following the policy of the NATP intends to form 80% of the CIGs with small and marginal farmers and this must include tenant farmers and sharecroppers.

**c. Issues concerning Women**

The main issue concerning women is enhancing and facilitating their participation and thus enabling them to have due share of the project benefits. The ARTS specially aims women’s empowerment and must target that about 20% of the group members in crop and fisheries CIGs and 30% in the livestock CIGs are women. The concerned implementing agencies, particularly the DAE, DLS and DoF will ensure that required number of groups organized exclusively of women members with further emphasis that such women members are taken from the small and marginal farm households and female-headed households. In the fisheries subsector however, some CIGs may be mixed male female groups as finding 15-20 women aquaculture farmers in the same village may be difficult.

It may happen that the women members have tiny little agricultural holdings but they are most likely to have considerable involvement in homestead agriculture such as fruits and vegetables farming, poultry and goat rearing, operating homestead pond and plant
nurseries etc. Also they are likely to have large involvement in post harvest activities and seed preservation. It is therefore important to give priority to women while selecting participants for training and extension services in such activities.

The agriculture census data recorded presence of only about 3% farm households headed by women. But many farms, not presumably headed by women, may have women members of the household substantially involved in the farming activities such as caring the animals and poultry. They deserve inclusion while forming special groups of women farmers. This will benefit not only the women’s empowerment but also contribute to increasing productivity. In many cases, particularly in the case of homestead agriculture, women are more intensively involved in farming than men as men tend to work outside of the house most of the time in other part of the farming, say ploughing and planting to harvesting and women are more involved in post-harvest and homestead agriculture.

The issue here for the project is that while selecting technology package and crops etc. women are not forgotten and given preferential treatment. The examples could be seed preservation, livestock rearing, backyard poultry, aquaculture in small homestead pond, kitchen gardening, small poultry farm and duck rearing etc. and in such activities women farmers should get priority for inclusion.

d. Tribal people
Government of Bangladesh does not use the term indigenous people as the constitution of the country has no such provision. The recent (15th) amendment of the constitution termed them “small ethnic community”, and they are entitled to special attention as “backward section of the people”. In the population census, they are identified as “tribe”.

The ARTS districts have very low concentration of ethnic minority and tribal peoples. Compared to 1.1% nationally, the ARTS districts have only 0.22% “ethnic minority”, highest 0.76% in Bhola and only about 0.04 to 0.20 percent in other ARTS districts.

Table 17 below provides number of tribal household and population as per Statistical Yearbook 2011 quoting the Population Census 2001 in the second and third columns. The figures in the last column show numbers of tribal household as per community series data of Population Census 2001. It is surprising that the community series data shows very few households in each district which is only about one tenth of those shown in the second column. This discrepancy makes it essential to assess in the field level the actual concentration of the tribal people by discussion with the local government representatives and other knowledgeable people in Upazila level meetings.
The Community Series data providing breakdown of tribal household and population by Upazila, UP and village showed only 367 Tribal households in the six ARTS districts against 3,478 in the BBS Statistical Yearbook. There seems to have been gross mistake and misunderstanding between the two documents. However, it is clearly evident that the presence of tribal people and even of ethnic minority in broader definition in the ARTS districts is very low and widely dispersed rather than concentrated in a few villages or UP. The community series data provide number of tribal households and population in each village, UP and Upazila and it appears highly dispersed.

According to the Community Series data, there is just one UP (Matborer Char of Sibchar Upazila, Madaripur) with some concentration of Tribal households, 212 households at village Bakhukandi. Second highest concentration is 15 Tribal Households at village Purba Shreekoil of Shreekoil UP, Shreepur Upazila, district Magura. Nowhere else in the ARTS districts there is concentration of ten or more Tribal households in one village. In one UP of Belkuchi Upazila, ten tribal households live in one UP (Daulatpur) spread over four villages.

The tribal people, living in proximity and in cordial relation with the mainstream Bangalee community have integrated in to the Bangalee society, speaking Bangla and children educated in Bangla schools. In reality, there is no other option, how a tribal community of only about half dozen households live in isolation from the mainstream community? Also, the Tribal households had a tendency to migrate to the urban areas and are more involved in salaried services than in agriculture.

For the purpose of this SMF, indigenous people (irrespective of the official term used to mean them, ethnic minority, tribe etc) means a distinct and socio-cultural vulnerable group that possesses following characteristics in varying degree:

a) Self identification

b) Collective attachment to geographically distinct habitats or ancestral territories in the project area and the natural resources to such habitats and territories

c) customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and

d) an indigenous language

<table>
<thead>
<tr>
<th>District</th>
<th>Number of Tribal HH as per Statistical Yearbook</th>
<th>Tribal Population as per Statistical Yearbook</th>
<th>% of tribal Population as per Statistical Yearbook</th>
<th>Tribal HH as per Community Series data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sirajganj</td>
<td>389</td>
<td>2,159</td>
<td>0.06</td>
<td>28</td>
</tr>
<tr>
<td>Magura</td>
<td>69</td>
<td>296</td>
<td>0.04</td>
<td>49</td>
</tr>
<tr>
<td>Madaripur</td>
<td>481</td>
<td>2,243</td>
<td>0.20</td>
<td>229</td>
</tr>
<tr>
<td>Shariatpur</td>
<td>178</td>
<td>598</td>
<td>0.06</td>
<td>6</td>
</tr>
<tr>
<td>Gopalganj</td>
<td>283</td>
<td>1,804</td>
<td>0.15</td>
<td>19</td>
</tr>
<tr>
<td>Bhola</td>
<td>2,078</td>
<td>12,949</td>
<td>0.76</td>
<td>36</td>
</tr>
<tr>
<td>ARTS dist</td>
<td>3,478</td>
<td>20,049</td>
<td>0.20</td>
<td>367</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>289,948</td>
<td>1,410,169</td>
<td>1.13</td>
<td>75</td>
</tr>
</tbody>
</table>

In the case of the ARTS districts the tribes satisfy the first criteria to some extend and that too to a very limited extent as they are too few in number. The second and third criteria are not met and they do not have distinct language.

The point here for the ARTS is that, the project should make attempt to identify in the districts like Bhola and Madaripur in what specific Upazila, UP and village there is some concentration of 20 or more farm households belonging to some tribes to be organized in CIGs. In the case of tribal communities, men and women farmers can be organized in mixed CIGs and for all sub sectors (crops, livestock, fisheries and horticulture). The extension agencies may provide support to the mixed CIGs but they should not be excluded for low concentration or difficulty to reach them. If needed, they may also be included in CIGs formed in the nearby mainstream communities in case only few tribal households are found in one village. This is suggested because the Population Census report 2011 did not provide any data of tribal population and there is confusion between Statistical Yearbook data and Community Series data of Population Census 2001.

e. Elite-capture
The group approach has many advantages but at least one disadvantage, the risk of elite-capture of the group or the organization, the CIGs and POs in the case of the ARTS. It happens that the leadership in the group or organization is captured by the elite and whatever resources available are utilized to benefit them financially or politically. In the past, leadership was determined by economic and social status, age, education and people’s respect. Now it has worsened with the replacement of all these by politicization and bureaucratization. The extension agencies may not be able to act impartially and may have to compromise to the wish of those who can influence decision making. It is quite likely that the rich influential person will chair the CIG and PO and his sister in law or daughter in law will take the position of “women’s representative”.

5.2 Issues Relevant to Specific Components
In addition to the abovementioned general issues and concerns, each sub-component has specific issues which are described in this section.

5.2.1 Issues Relevant to Research Component
The SPGR sub component needs to be focussed to direct research in priority areas and specifically relevant to supporting farmers in the ATRS districts in the short term. The longer term research and institutional development of the NARS should better be addressed through the NATP and other resources.

Prioritization: Short versus Long Term: The issue relevant here is prioritization of research themes and specific sub projects to be taken up under the SPGR. The sub projects should be implementable in about one year so that the outcome can be utilized for supporting area-specific technology packages selected for the ARTS. The ARIs may insist to include activities like longer duration study programmes, and creation of facilities which could be very justified for longer term development but not appropriate to yield quick result. The support to SPGR may comprise limited number of research sub projects by a process of consultation with the extension agencies and other stakeholders to identify immediate
needs of the farmers in the ATRS. The CGP sub component proposed to carry out 40 short term research which is in line with the allocation provided in the project concept note.

**Affordability of the farmers:** One more concern of technology development is affordability of the technology by the smallholder farmers. One example of such technology is intensive and semi intensive shrimp farming which was never accepted by the small farmers. The rich farmers tried but abandoned for rapid degradation of land and polluting environment, affecting not only the surrounding area land and water but also the farm itself. So is the case of hybrid cattle that could not increase meat and milk production mainly for the farmers' inability to feed properly and adequately. The hybrid cattle need more feed than native cattle and the calf need more milk but the farmers cannot afford feeding the calf as he has to sell the bulk of the milk. Cattle breeding, however, have been more successful in Sirajganj than in other districts because Sirajganj has improved traditional varieties of cattle and the farmers are accustomed to better feed the cows and calves. Hence interventions in feed and fodder production may deserve higher priority than breed development at this stage and under a short duration project like the ARTS.

**Conflict between sub sectors:** One more concern of technology development is likely conflict between sub sectors. Higher emphasis on hybrid, expanding crop area and crop intensification by varieties and technologies aiming only yield increase may lead to increased use of chemical fertilizer, pesticides and insecticides that is detrimental to the conservation of fisheries resources, bio-diversity as well as to the aquaculture. The examples include residual effect and spillage of agrochemical on fisheries resources in particular. The remedy is higher emphasis in bio-fertilizer (which is coming up but quality of present supply is questioned) and IPM. Adaptive research in vermi-compost was suggested by the DAE officers in Sirajganj as a properity area.

**Inadequate linkage between research and extension:** Discussion in the field level revealed very low interaction between research and extension. Some researchers mentioned of yearly workshops held in the ARIs and at BARC and in that too very few extension officers attend. The extension officers however said that they are not always informed of what researches are going on. If the extension agencies ask for some laboratory tests, requests complied but such interactions are infrequent and inadequate. The extension agency officials highly emphasized the need for improving research extension linkage. One specific need identified was testing of soil from the farmers’ land to identify micronutrient deficiencies and recommending proper mix of fertilizer use. The DAE officers in Sirajganj specifically that, the soil quality map prepared by the SRDI is too old and the findings are not relevant in the changed circumstance after two decades. Collaboration with the SRDI was strongly recommended.

**5.2.2 Issues Relevant to Technology Adoption**

The DAE part of the sub-component acknowledged that the NARS has already released a number of area specific potential technologies. Since the project is of short duration, it need not wait for the release of new technology or varieties. Instead the project approach will be identifying suitable area specific technology packages including varieties for adoption through appropriate extension approaches. This applies also to the other extension agencies, the DLS and the DoF and the SCDC.
The DAE proposed following technology packages:
(1) Rice Yield Gap Minimization in Aus, Aman and Boro rice;
(2) Efficient use of irrigation water through supplementary irrigation to Aman and Aus Rice, establishment of buried pipes in existing Swallow Tube Well (STW), and promotion of Alternate Wetting and Drying (AWD) method of irrigation in Boro season;
(3) Development of Seed SME within the CIG for rice, wheat, pulses and oil seeds,
(4) Supporting for Green Agriculture (GAP, IPM, Soil health etc.) specially through introduction of high value crops, pulses and oil seeds,
(5) ICT based technology support,
(6) Promoting “Dhap” cultivation in specific areas,
(7) Agribusiness development for income generation for the poor and pro-poor communities.

The DAE officers in Sirajganj desired inclusion of several technology support including:

a. Popularizing wheat cultivation to produce more crop with low water use
b. Enhance production and marketing of food safe to human health (control of formalin use etc)
c. High emphasis on high-value crops- tomato, cabbage, cauliflower, mushroom, chilli.
d. As for means to achieve the above, the DAE officers in Sirajganj desired supply of sprayer, power tiller, weeder, harvester, moisture meter, electric balance and soil testing kits for the FIAC and Tool Box for the SAAO.

The technology packages proposed by the DLS in the six districts include the following:

1. Improved native breed and cross breed (buffalo in Bhola and cattle in all districts)
2. Vaccination and de-worming (buffalo in Bhola and cattle, goat, sheep, poultry and duck in all districts)
3. Strengthening of veterinary care (buffalo in Bhola and cattle, goat and sheep in all districts)
4. Expansion of fodder cultivation in all districts
5. Increasing availability of modern variety ducklings in all districts (from government hatcheries to registered duckling farmers and through them to other farmers).

The technology packages proposed explicitly or implicitly by the DoF in the six districts include the following:

1. Cage culture
2. Pen-culture
3. Mother shrimp and prawn development (should be in research)
4. Production of pillet as fish feed
5. Basic aquaculture best practices
6. Advanced aquaculture practices
7. Operating sanctuary

Type of fish to be promoted for aquaculture was not mentioned in the component concept note but may include:

a) Native carp (ruhi, Katla, mrigel), common carp, grass carp, mirror carp etc.
b) Native koi, shing, magur, native and Thai shor puti, tilapia
c) Golda and brackish and fresh water fish alternating with paddy farming in Gopanganj and Bhola and alternating fresh water fish with paddy farming in the flood plains in other districts.

The technology will be disseminated through extensively used extension approaches like group discussion, method and result demonstration, field days, motivational tours, agricultural fairs and training etc. The technology packages proposed by the extension agencies seems appropriate and endorsed in the field level consultation meetings held in five of the six ARTS districts during 20\textsuperscript{th} to 22\textsuperscript{nd} November 2012 and in Sirajganj on 30\textsuperscript{th} to 31\textsuperscript{st} December 2012.

In each sub sector, the extension agencies will provide training to the CIG members, CIG leaders, Producer Organization leaders and other primary stakeholders. Other supports will comprise demonstration, exposure visits and exhibition fairs etc.

\textbf{A number of issues are relevant to the technology adoption component. The important ones are described below:}

\textbf{a. Availability of quality inputs in time and at reasonable cost}

The extension agencies will mainly provide training, technical advice and will organize demonstration in various technology packages suited in local conditions. But they will not be able and are not mandated to supply inputs like quality seeds, fertilizer, feed, fodder etc. Also the extension agencies are not in a position to supply inputs to so many farmers which is the responsibility of other organizations like BADC and presently the private sector is doing the job in quantitative terms, more than adequately. The problem remains in quality and price. Because of market imperfections, the seed companies charge exorbitant price and the quality is not ensured. This applies to crop seeds as well as fish and shrimp/prawn fry, fingerling, poultry and duck chicks. The problem is more acute in the case of HYV and hybrid as farmer to farmer supply or preservation of own seed is not possible for the hybrid and for the HYV the foundation seed must be replaced every three years.

The small, marginal and women farmers are in disadvantageous position to access such input as they need very small quantity individually and for that procuring inputs such as from the BADC is expensive. The extension agencies are not in a position to change market condition but they can do several things including (a) encouraging the CIGs and POs to procure seed for the group, (b) the extension agency staff may check quality by physical examination and even by laboratory test and refer farmers to specific BADC store or reliable dealer, and (c) train some advanced farmers of some easy tips to examine quality. The extension agency officers in Sirajganj indicated that some seed companies are maintaining quality while others are not so careful to it. This implies selectivity and the extension agencies may guide the CIGs to identify good seed.

For the traditional variety seeds, the DAE has proposed to promote about 1500 Community Seed SME involving the most skilled members of CIGs. The same approach may be followed by other extension agencies. The DoF may train and develop skills of nursery operators and help the establishing linkage with the Government hatchers, Fish Seed Multiplication Farms and reliable private hatcheries. Similarly, the DLS may encourage
farmers to rear goat and sheep bucks and improved local bulls and buffalo bulls within CIG by selected farmers so that other farmers can avail service at nominal fee. The DLS may also help farmers to better access AI service and providing proper breed considering the size and health of the cow and management capacity of the farmer.

One problem in Artificial Insemination is selection of breed and level of crossing between local and foreign breed. AI is not new in Bangladesh. It is more than fifty years old and many farmers avail AI service. The calf produced is not bad but the problem remains in feed. Feed and fodder problem is acute in all districts but a bit better in Sirajganj.

b. Continuity of input supply from the GoB agencies
In the case BADC, it is possible to ensure supply to farmers on a regular basis. But it is difficult for the government agencies, the DLS and the DoF. The DLS and the DoF managed hatcheries and fish seed multiplication farms have limitation to maintain supply of poultry and duck chicks, fish fry/ and fingerlings etc. on a regular basis. The GoB firms lack authority to maintain operating fund. They are required to make plan every year or every season, get it approved, then receive fund, go on production, sell the output then deposit sales proceed to the treasury. After that, they have no fund to carry on production in the next batch for which they have to submit new plan, get it approved, fund released and everything afresh. By this time production season is over and the farm become idle and farmers deprived of service. The extension agencies may place an operating fund kept in a special bank account to manage production and sale. The account can be operated by the concerned farm manager together with the concerned Upazila or District head of the DLS/DOF.

c. Transparency and accountability of the service delivery systems
Farmers in Bangladesh have limited access to extension services, for various reasons, and this is true for all sub sectors and all categories of farmers. The poorest categories - the landless, small and marginal farmers and farm women lack access more severely than others. The commercial poultry farmers can somehow afford engaging trained staff, although not adequately qualified and large holders in aquaculture also manage to access limited extension service. But the backyard poultry rearing women and small pond operators are least served and suffer most.

The extension agencies agree (as revealed from discussion in the field level) that they cannot adequately reach the farmers in the remote villages mainly because of staff shortage and for lack of facilities like transport and travelling allowance. The DAE officers in Sirajganj said that they are not equipped to reach extension service to the farmers of Chauhali Upazila located on the other side of the river Jamuna. In their opinion, this Upazila should better be covered from Tangail Office.

The main problem however is lack of accountability of the public extension services. Officially, the field level extension officials are accountable to the line departments through Upazila and district offices. Effectively, field level supervision is inadequate, reporting is limited to paper work and politically motivated staff unionism has further limited staff presence to occasional program days only. Further, the extension officers are often engaged in several other government functions like election duties, protocol, census, relief
distribution etc. which are necessary but affect their main job, reaching extension service to farmers, given limited staff and facilities.

The FIAC to be established under the ARTS following the experience of the NATP is likely to improve the situation. This can be further improved by establishing accountability of the extension agencies to the Producer Organization and enhancing cooperation between the extension agencies and the local government, the UP in particular. The FIAC is planned to be located at the UP complex (or at UP office). For this purpose, the selected ARTS UPs should have UP complex (or the existing UP office should have facility, a couple of rooms to accommodate SAAO and other extension personnel of the ARTS). This will improve cooperation between the extension agencies and the UP and improve farmers’ access to the extension services.

d. Participation
The ARTS is an integrated project comprising three main components that concerns directly serving the needs and aspirations of various categories of stakeholders at the grassroots and the concerned implementing agencies (DAE, DLS and DoF) from the national to the Upazila and even village level belong to two administrative ministries (MOA and MoFL). To make sure that the diverse primary stakeholders are reached and particularly the weaker groups like the poorest farmers, tribal people and women are not excluded requires enhancing participation of these primary stakeholders. But how to ensure or at least encourage their participation remains an important issue.

Participation in the development projects can be of different levels. The lowest form of people’s participation is opinion giving and then doing everything else by the executing agencies. Next level is consultation to make decision, still decision making power remaining with the executing agency. The third level is joint assessment and decision making. The fourth level is collaboration and partnership between the target community and the executive agency where implementation and ownership are shared. A much higher level of participation is empowering the community to make own plan, execute the plan and takeover the operation of the system at a later stage. It involves community capacity building while the executing agency retains supportive and facilitating role but not “control”. This level implies that the community is capable enough to plan, execute and maintain own projects and take assistance of the relevant GOB agencies and other service providers like NGOs and private sector on own initiative.

The ARTS should take initiative to encourage participation of various stakeholders, particularly of the poor and women in various activities that suit locally. This could include family based poultry, aquaculture, horticulture and vegetable production which benefit the poor and women in particular.

Traditionally, partner NGOs are hired to organize groups and reach services to the groups. However, the ARTS will do it through own extension staff in the case of DAE and through own staff and community level extension agents in the case of DLS and DoF.
e. Elite capture
Elite capture of community based organization is a potential risk in all components but more importantly in the technology adoption. It is difficult to avoid such elite group because they hold local power. Reaching the genuine landless and poor requires long organizational process rather than just forming groups or listing of intended beneficiaries. The facilitating organization must be physically present in the community say in the UP and not outside of the community say in the Upazila or district town. This will help them continuously observe and find truths. Fake names will eventually go and genuine ones will be coming up, gradually, the poor, poorer and poorest ones.

Elite capture is difficult to avoid but it is not impossible. Doing it requires awareness of the problems, the local contexts - identify the elite, the touts, their stakes and linkages - and then act proactively. For the ARTS the task must involve the extension agency officers, the community level extension agents and close cooperation with the local government leaders, the UP members and chairman. Efforts must be made to orient the local stakeholders including the elites explaining the project objectives, the target groups and importance of delivering services to the target groups on a priority basis. Such reorientation will help reducing elite capture although it may not be fully eliminated.

f. Institutional Sustainability
GoB built a good number of research and training institutes, trained thousands of officers and staff and the targets at the output and outcome levels were largely achieved. But problems remained in sustainability. Once the project is closed, continuity suffers as funds under recurrent budget are difficult to be approved. Community level work tended to depend on donor supported projects and sub-projects contracted under various national projects. Once such contracts expire, the activity ceases and the target groups are frustrated. In the case of GOB project, continuing assistance through recurrent budget is a possibility. But the support provided under the recurrent budget remains low and inadequate.

The ARTS project has an advantage that it targets community capacity building. The CIGs and POs established will receive training in both technology packages and organization management. One criteria judge project success would be sustainability of the CIGs and POs beyond the project period.

g. Land acquisition and resettlement:
The project does not involve any land acquisition and no physical construction, hence there is no resettlement issue. However, the technology adoption component in the DAE part involves promoting surface water irrigation. The surface water irrigation has an advantage of higher acceptability from the environmental point of view and low cost. This deserves prioritization over ground water irrigation, particularly during aus and aman season in all districts and also during boro season in the southern districts like Bhola and Gopalganj. The surface water irrigation will however not include re-excavation of canals or construction of dykes. It is likely to include setting of buried pipes and the use of flexible pipes from the LLP point to particular piece of land up to a few hundred meters.
In the case of flexible pipes, there is no land issue. In the case of buried pipe too there is not much land issue as land acquisition and not even the use of land on permanent basis is required. It will simply require digging land to set pipe and after that the pipes will be covered by the soil. It may have several pits in the corners of land. To execute the work it will be needed to hold dialogue between the adjoining landowners to decide where to set the pipe, locate the pits and whose land to get water. Agreement has to be reached among the landowners and water users. The concerned CIGs and the POs should take care of the dialogue and the concerned executing agency will have a facilitating role and ensure that no conflicts arise or if any are resolved mutually. It is advisable that, in the case of supplementary irrigation buried pipes will not be allowed and also in the case of permanent nature of irrigation service sub project, buried pipes will be avoided as much as possible and other alternatives like flexible pipe will be preferred.

Canal re-excavation may be required and demanded but the ARTS may not be able to support it as project duration is rather short. However, if the project area is covered under small scale water resource development project of the BADC or the LGED, the executing agency may help establishing linkage between the concerned CIGs and POs with the BADC or LGED project offices to get the benefits. Avoiding canal excavation will eliminate the need for land acquisition and resettlement.

h. Intra and Inter agency cooperation
The stakeholder analysis provided under section 4 indicated involvement of a variety of secondary and tertiary stakeholders, who are involved at various levels and have a variety of competing and even conflicting interests that can affect project from the very design stage through execution to future institutionalization. The ARTS requires the following consultation and consensus building process to resolve such intra and inter agency concerns.

i. Agreeing between development partners on specific sub project objectives, implementation modalities, sub sector and agency wise allocation of resources and clearly defining roles of each agency
ii. Defining roles of private sector and CBOs concerning project activities
iii. Defining roles of national, district and local administration and local government (Upazila and Union Parishad) concerning project activities
iv. Segregating activities and allocations targeted to special groups such as SM farmer, landless, tribal people and women
v. Ensuring transparent planning and execution of various project activities and involving media representatives, business association, civil society and even staff union executives in stakeholder consultations at various levels, and
vi. Decentralized decision making as well as inter institutional linkages, in particular between Union Parishad and Upazila.

5.2.3 Issues Relevant to Supply Chain Development Component
The Hortex, with the experience of the NATP, will facilitate the integration of 6,000 small and marginal farmers and agribusiness enterprises into modern supply chains by promoting more equitable chain governance and efficient market linkages for selected high value commodities. The ARTS will operate in 5 Upazilas and 5 districts affected by hard-core and
extreme poverty and natural risks. This selection will also permit economies of scale with the current NATP operations and avoiding overlapping with other supply-chain projects. The initial selection of commodities is based on market demand, margin between the producer cost and the consumer price, margin for improvement of problems and includes: onion and spices; flower, mungbean, onion, banana; honey, fish, medicinal plants; milk and dairy products; coconut and betel leaf. Beneficiaries will be 6,000 marginal and small farmers organized in Common Interest Groups (CIGs) and Producer Organizations (POs).

The ARTS will promote business linkages between farmers, traders, processors, transporters and other service providers (e.g. quality control and finance) in and outside the 5 upazilas. The project will also promote an NATP-derived technology package: 10 Commodity Collection and Marketing Centres (CCMCs); 32,000 man-days of training and 400 demonstrations to familiarise farmers and the other stakeholders with 20 post-harvest technologies ranging from simple sorting and grading to processing and information communication technologies. CCMCs will permit farmers to operate simple packaging and processing equipments, zero energy storage and chilling facilities for horticultural produces. Such package will be complemented by developing a prototype IT system connecting CCMCs and value-chain actors and enable to learn for the possible wider-scope supply-chain software. ARTS will also provide a matching grant for an amount equivalent to the savings accrued by CCMC farmers up to a ceiling.

The main issues relevant to the SCDC include the following:

a. Health safety
The SCDC will promote mainly fruits, vegetables, milk, dairy products, betel leaves, onion, chilli, spices etc. directly consumed by humans, in cooked or raw form. Hence the use of pesticides, fertilizer and other agro-chemicals are likely to have higher residual effects than for example rice and other cereals. It is therefore more important that the use of harmful agri-chemicals are avoided or minimized. Examples can be cited of brinjal that uses too much of pesticides. Further, formalin is used for preservation of fruits, vegetables, milk and fish while harmful chemicals are also used for ripening of fruits. The NRTS pledges to promote organic farming in the production as well as in the post-harvest covering the whole supply chain. This involves sacrificing quantity or yield for quality or health safety and requires premium price for the quality produce. The normal marketing may not ensure premium price hence the ARTS pledges to improve market linkage for the CIGs and the POs.

b. Pollution
Several high-value crops are likely to increase the use of chemical fertilizer and pesticides that can pollute particularly water, air and soil and there by affect biodiversity, fisheries and livestock, besides the humans, unless agro-chemicals are gradually replaced by green manure and IPM.
Part II: SOCIAL MANAGEMENT

6. Social Management Framework

6.1 Baseline Description

The ARTS will directly contribute to increased agricultural productivity in the target areas (ecologically constrained and economically disadvantaged) and with emphasis to target farmers (small and marginal farmers, women farmers). This will be accompanied by increased employment and income opportunities for the target farmers. Indirectly it will contribute to enhanced availability of the crops, fish, milk, meat, eggs etc in the market and through enhancing productivity it will help improving income, food security, living condition, access to education and health and nutritional standard etc.

The ARTS components and activities are unlikely to adversely affect any disadvantaged group. The project design is such that the research activities are determined through effective consultations with the relevant stakeholders to ensure that the technology to be developed are need based and suited to local agro-ecological conditions.

The technology adoption activities also will be very participatory in nature, to be selected by the farmer groups. Therefore, it can be expected that the component activities are pro-poor and they adequately take into account of the interests of the weaker groups like the landless and women. However, there remain some concerns like elite capture.

The irrigation activities under the technology adoption component will focus mainly supplementary irrigation during aus and aman seasons to better utilize surface water and improve efficiency of water use through promoting mainly flexible pipe and buried pipe to a limited extent. It will also include promoting technology like alternating wetting and drying method. Therefore the activities are likely to be environment friendly and not detrimental to any social groups.

The project will avoid land acquisition and resettlement. However, the improving irrigation by buried pipe may require mutually compensating for any crop loss to the affected farmers and landowners by the beneficiary farmers, often same people.

In the other activities under technology adoption, social concern would be probable elite capture and the marginalized groups not having enough opportunity or not empowered enough to effectively participate. It may happen for the weaker groups like the landless farmers, women and tribal community farmers.

The information and analyses provided above indicate very clearly that the type of interventions to be implemented under each component including the technologies to be promoted and the implementation mechanisms are all fairly known. Hence the outcomes are also known and predictable. The unforeseen adverse consequences will be minimal but it may not be possible to fully avoid them. Considering the above, it is felt important that the ARTS project makes some special arrangements to avoid unpredictable adverse
consequences or uncertain outcomes. To overcome such possibilities, a simple social safeguard management framework has been proposed in this chapter to be applied in the components 2 and 3 and a simple format for consultation to mutually compensate for any crop damage caused during the installation of buried pipes also in component 2.

6.2 Regulatory framework

6.2.1 The GoB Social Regulative Framework

a. Constitutional provisions:
The constitution of the people’s republic of Bangladesh pledges

A society, “ free from exploitation in which the rule of law, fundamental human rights, freedom, equality and justice - political, economic and social, will be secured for all citizens”. – The preamble page.

“Ensure participation of women in all spheres of national life.” – Article 10.

“Emancipate the toiling masses – the peasants and workers – and backward sections of the people from all forms of exploitation”. – Article 14.

“Shall adopt effective measures to bring about a radical transformation in the rural areas through the promotion of a agricultural revolution, the provision of rural electrification, the development of cottage and other industries, and the improvement of education, communications and public health, in those areas, so as progressively to remove the disparity in the standards of living between the urban and the rural areas”. – Article 16.

All of the above constitutional provisions are important since they pledge not only equality, but also special safeguards for the weaker section of the society.

b. The GoB Policies, Laws, Rules and Strategies:
The Government of Bangladesh has several important policies pertaining to development of agriculture – crops agriculture, fisheries and livestock and the policies incorporate social safeguards in relation to the development of agriculture, besides economic growth. Such policies are many in number. However, only a few most directly relevant ones are listed here along with the main objectives of them:

1. National Agriculture Policy, 1999 and 2010 (Final Draft)
4. National Food Policy, 2006
6. Sixth Five Year Plan 2011-15
7. Land Acquisition Ordinance 1982

The above GOB policies in general emphasize equity and give special attention to the disadvantaged groups. Some of the most relevant policies emphasize the following:
1. **The National Agriculture Policy (NAP) 1999 and NAP 2010 (Final Draft)**

The NAP 1999 highlights as one of its 18 main objectives as under:
- Protect interests of the small, marginal and tenant farmers

Woman was not specially mentioned in the objective part but a section was included at the end recognizing women’s role in particular to agricultural activities like post-harvest work and kitchen gardening and pledged training them in such areas and providing credit and extension support.

Under research section of the NAP, one of the 20 priority areas emphasized “enhanced participation of women in agricultural activities and removal of constraints”.

The National Agriculture Policy (Final Draft 2010) broadly aims at creating an enabling environment for sustainable growth of agriculture for reducing poverty and ensuring food security through increased crop production and employment opportunities. The specific objectives are:

i) Developing and harnessing improved technologies through research and training;

ii) Increasing productivity and generating income and employment by transferring appropriate technologies and managing inputs;

iii) Promoting competitiveness through commercialization of agriculture; and

iv) Establishing a self-reliant and sustainable agriculture adaptive to climate change and responsive to farmers’ needs.

Section 11 of the NAP 2010 has a section on women in agriculture and wishes to that:
- Necessary support will be provided for capacity building of women in promoting household food and nutrition security.
- The Government will facilitate increased women participation in management decision making and their advancement in agriculture.
- Efforts will be made to ensure women’s equal access to agricultural inputs (e.g. seed, fertilizer, credit, education & training, information etc.).

2. **The National Fisheries Policy 1998:**

NFP specifies its main objective as:
- Enhancement of the fisheries production.
- Poverty alleviation through creating self-employment and improvement of socio-economic conditions of the fishers
- Fulfil the demand for animal protein,
- Achieve economic growth through earning foreign currency by exporting fish and fisheries products;
- Maintain ecological balance, conserve biodiversity, ensure public health and provide recreational facilities.

Women’s empowerment was not specially mentioned in the objective part but in the aquaculture part it did mention under fish culture that women will be “encouraged for fish culture and trained”.

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3. **National Livestock Policy 2007**

The **general objective** of the National Livestock Development Policy:

To provide the enabling environment, opening up opportunities, and reducing risks and vulnerability for harnessing the full potential of livestock sub-sector to accelerate economic growth for reduction of rural poverty in which the private sector will remain the main actor, while the public sector will play facilitating and supportive role.

The **specific objectives** of the National Livestock Development Policy:

1. To promote sustainable improvements in productivity of milk, meat and egg production including processing and value addition;
2. To promote sustained improvements in income, nutrition, and employment for the landless, small and marginal farmers; and
3. To facilitate increased private sector participation and investments in livestock production, livestock services, market development and export of livestock products and by-products.

The National Livestock Policy 2007 is specific about helping the small and marginal farmers in the livestock sub sector but not so specific about women in livestock production. In the interior part of the text it has however indicated to support women in operating small scale dairy farms and improving their access to marketing of livestock products and micro credit service.

4. **The National Food and Nutrition policy 2006:**

The goal of the National Food Policy 2006 is to ensure a dependable food security system for all people of the country at all times.

The specific objectives are:

a. to ensure adequate and stable supply of safe and nutritious food;

b. to enhance purchasing power of the people for increased food accessibility; and

c. to ensure adequate nutrition for all (especially women and children).

5. **National Women Development Policy, 1997 revised in 2004 and 2011:**

NWDP is very comprehensive. It comprises 22 objectives and 49 sections in three parts. Each section contains several sub sections and several identified actions in each. Mentioning all is unnecessary. A few of the important objectives include:

- Equality between men and women
- Security of women from family to state level
- Economic, social and political empowerment of women
- Ensure human rights
- Poverty alleviation of women
- Prevent oppression against women and girls
- Equal access to education, sports, culture etc.
- Special assistance to distressed women like poor widows, divorced, separated, abandoned, single women
- Institutional development
Besides the above provisions of general nature and broader in scope; the NWDP 2011 specifically included two objectives highly relevant to the development of technology. These are:

- Pledging development of women-friendly technology and prevent the use of technology detrimental to women, and
- Promotion of women entrepreneurs.

6. **Sixth Five Year Plan**

Government of Bangladesh has formulated the Sixth Five Year Plan moving away from the recent practice of preparing PRSPs but with similar objectives and strategies like accelerated growth and poverty reduction as the main objectives. The Sixth Five Year Plan is under implementation during the period 2010-11 to 2014-15. The plan specified several objectives and targets for the agriculture sector of which the important ones are noted under the three sub sectors.

**Targets and Objectives for Crop Sub-Sector**

a. To attain self-sufficiency in food grain production along with increased production of other nutritional crops;
b. To increase productivity and real income of farming families in rural areas on a sustainable basis;
c. To promote adoption of modern agricultural practices in drought, submergence and saline prone areas;
d. To encourage research on adaptation to climate change, proper use of genetically modified technology in agriculture.

e. To gradually shift the main HYV, irrigation-fed Boro rice production to the Southern areas and to utilize new salinity, submergence, and other Stress tolerant varieties and also to utilize abundant surface water for irrigation;
f. To utilize the irrigated north-western uplands to grow more high value cash crops like wheat, maize, corn etc. and horticulture products;
g. To emphasize on yield gap reduction and also to emphasize on maximization of yield in Aus and Aman crops with similar care as the Boro cultivation for ensuring self-sufficiency in food grain;
h. To strengthen farming system/cropping system/whole farm approach based technology transfer;
i. To promote the use of modern technologies with the help of ICT;
j. To strengthen agricultural mechanization for enhancing production;
k. To ensure quality seed at farmer’s level through the development of community based seed production, storage, and dissemination system;
l. To strengthen decentralized knowledge based extension system.

**SFYP Targets and Objectives for the Livestock Sub-sector**

i. To promote sustainable improvements in productivity of milk, meat and egg production including processing and value addition;

ii. To promote sustained improvements in income, nutrition and employment for the landless, small and marginal farmers; and

iii. To facilitate increased private sector participation and investments in livestock production, livestock services, development and export of livestock products and by-products.
SFYP Targets and Objectives for the Fisheries Sub-sector

A few of the objectives and targets are noted here.

i. To give higher emphasis on the management of open water capture fisheries to increase yield (and improve conservation) since the potential for pond culture has nearly been exhausted (or near saturation in the central and northern part but still has potential in the south, southeast and northeast).

ii. Although the potential for pond culture has nearly been exhausted, steps should be taken to raise the productivity of pond fishery in the country.

iii. Initiatives should be taken to enhance the productivity of shrimp culture.

iv. Community-based fisheries management should be encouraged. There are already some examples of successful community-based management of open water fisheries that can be disseminated and replicated in other places. This ensures broad-based participation of community people in the fisheries management as well as higher production.

7. Land Acquisition Ordinance 1982

Under 1982 Ordinance, lands for projects are acquired and the affected persons entitled to receive legally stipulated cash compensations. But the amount of compensation paid seems to be grossly inadequate to deal with the adverse impacts associated with land acquisition and involuntary displacement. It happens so because land price is determined by examining past three years record of land transfer. In such land transfer transactions price mentioned is grossly undervalued to evade tax. Government provides 50% top-up to compensate for such under valuation but this too is inadequate as market price is often three or four times of what is shown in land transfer records. Further, payment of compensation is delayed after following a long process.

The law (1982 ordinance) contains a detailed procedure of conducting the process of land acquisition and payment of compensation systematically and by stages. Consequent upon the receipt of the Land Acquisition Proposal (LAP), Deputy Commissioner (DC, following steps in the land acquisition process, makes a physical verification of the proposal to serve a legal notice (under section 3 of the ordinance) in the prescribed manner to the effect that a particular property be acquired by the government and as such the persons with interests in land and non-land assets would claim their compensation. After making proper enquiry of the claims, the DC finalizes the award of compensation and serves a legal notice (under section 6) to the concerned persons for receiving stipulated compensations.

6.2.2 The World Bank Safeguards Policies

This social assessment briefly examined the applicability of World Bank operational policies on social safeguards related to Indigenous Peoples (OP 4.10) and involuntary resettlement (OP 4.12).

In the case of OP 4.10 on Indigenous Peoples, the WB requirement is to ensure free, prior and informed consultations with the tribal communities, eliciting their broad support to the project and ensuring that there are effective grievance redressal mechanisms in place for these communities.

The World Bank’s Operational Policy (OP 4.12) on land acquisition and resettlement applies to acquisition or involuntary taking over of land resulted in: (a) relocation of shelter, (b) loss of assets or loss of access to assets, (c) loss of income sources or livelihoods or (d) involuntary restrictions to access (such as to natural resources).
The World Bank’s Policy on resettlement suggests and aims that the involuntary resettlement should be avoided, where feasible or minimized by exploring all viable alternative designs. And, where it is not feasible, resettlement activities should be conceived and executed --- enable the persons displaced by the project to share in project benefits. The displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs. Also the displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to the levels prevailing prior to the beginning of project implementation, whichever is higher.

6.3 Rationale for the Social Management Framework

Although the project may not have any adverse social impact, except for technology adoption and SCD component and that too to a limited extent, this social management framework has been prepared to ensure overall social sustainability of the project and better address the issues relevant to the weaker segments of the farming communities and fully avoiding land acquisition and resettlement.

The SMF will be used to assess related social/resettlement aspects of the subprojects to be funded under the project components and develop appropriate measures to mitigate consequent potential adverse social impacts. The SMF presented here is generic and more specific sub project level information will be known during and after the design of site-specific sub-projects. The Framework will therefore serve as separate set of guidelines to assess the social impacts of all subprojects and carrying out of a meaningful consultation and grievance redressal mechanism to mitigate adverse social aspects both in the design and implementation phases of the subprojects. This exercise will be done while preparing the micro plans, once a year in the UP level with the full involvement of the CIGs and the POs.

The social management framework strategy will comprise but not necessarily be limited to the following strategies:

- Detailed baseline studies will be conducted in the project level covering all of the six districts and two to three villages per district during the first six months of project implementation. The social assessment part of this report has already compiled district level secondary information and carried out Focus Group Discussion in four villages. These can be used as guide to design baseline survey which will be more systematic based on scientific sampling frame.

- The sub projects proposed for inclusion will ensure that there is adequate baseline information segregated to social groups and analyzing inter-group dynamics in order to help ensuring equitable participation and benefit/cost sharing by all relevant stakeholders.

- The project will encourage taking up of environmentally sound activities like IPM, reduced use of agrochemicals etc. under the technology adoption and the Supply Chain Development components.

- The project will ensure that all activities and sub projects comply with the legal framework of the country relevant to social development and environment management.
The project will carry out regular consultations with the stakeholders, particularly with the primary stakeholders during project design and implementation to take care of local concerns and make best use of integrating local knowledge with the new technology being promoted.

The project will have adequate focus on the vulnerable groups such as SM farmers, women and tribal people, making sure that their livelihoods are positively impacted and they have equitable opportunity to participate and benefit from the project interventions.

The project will promote enhancing transparency and accountability by inclusion of primary stakeholders including representatives of the vulnerable groups at all levels of project management – from the grassroots to the project steering committee.

The project will ensure disclosure of project information in the public domain – displaying on bill boards, notice boards of project offices and LGBs etc., newspaper, electronic media and website.

The project will assist capacity building not only of the GoB agencies but also of the farmer groups and CBOs, the CIGs and POs in particular.

6.4 Likely Social Impacts of the ARTS Interventions

Possible Social Impacts under Research Component: Although no adverse social impacts are envisioned under this project component, the issues like prioritization and inclusion of research sub projects on the basis of needs identified by the farmers and the extension agencies should be addressed properly. The researches should be of adaptive nature of which result will be known quickly so that the recommendation can be used to solve farmers’ problems. The adaptive research should consider farmers’ affordability to use the recommended technology and benefit from it. The technology developed must be eco-friendly, pro-poor and women-friendly. It must also take into account of the conflicts between the sub sectors, the expansion of HYV, hybrid crops, increased use of agro-chemicals negatively impacting fisheries. Efforts should be made to find ways to better integrate the sub sectors like fish with paddy where fish will add natural fertilizer for crops increasing productivity of both and reducing use of chemical fertilizer. Duck and poultry rearing is another potential area and technology packages are already available but may need up-dating with new research based knowledge. The extension agency officers highly emphasized the need for improving research extension linkage.

Possible Social Impacts under Technology Adoption Component: Although no adverse social impacts are envisioned under this project component, the proper identification and targeting of project beneficiaries and developing a participatory and inclusive communication and consultation strategy is imperative; as in the absence of these there is risk of causing marginalization, especially with respect to women farmers and those with relatively smaller land holdings or belonging to ethnic minority/tribal groups, and landless fishers. It appeared from discussion in the field that the sharecroppers are excluded as they are not “permanent” farmers. The extension officers’ perception is that they may leave farming as owners may not agree to lease out land next year, which is however not fully correct. If one owner disagrees to lease land to a particular farmer, the tenant or share cropper will approach other owners, will find some other land and will stay in farming in most cases.
Another adverse effect can be through increased use of chemical fertilizer, pesticides and other agro chemicals affecting aquatic biodiversity, particularly the fisheries resources and thus negatively impacting the livelihoods of the fishers and the fish farmers.

**Possible Social Impacts of the Installation of Buried Pipes:**
There is no land acquisition involved hence no resettlement will be needed. However, there will be a need for reaching agreement between the landowners and water users for the installation of buried pipes. Any attempt to setting pipe by force or without proper consultation may lead to conflicts between the adjoining landowners and the beneficiaries of irrigation if they are not same people. The concerned lands will be affected temporarily for when the trances will be dug and pipes set. After completing installation of pipes the landowners will be able to use the land as usual. The problem can be eliminated or minimized by setting a time when the lands do not have any standing crops. Also the proper alignment can be made to make use of roadside or walkways so that crop land is not affected.

**Possible Social Impacts under Supply Chain Development Component:** Adverse effect of the SCDC is foreseen concerning health safety of humans for the likely increased use of pesticides and chemicals as preservatives of fruits, vegetables and milk and ripening material for fruits. Increased use of pesticides can further aggravate water pollution causing deterioration of open water fisheries resource and thereby negatively affect the livelihoods of the fishers. Seepage of agro chemicals to ponds can affect aquaculture production affecting the livelihoods of the fish farmers.

<table>
<thead>
<tr>
<th>Table 18: Potential Social Impacts</th>
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<tbody>
<tr>
<td><strong>Social Impacts (both Positive and Negative)</strong></td>
</tr>
<tr>
<td>Research Component:</td>
</tr>
<tr>
<td>• Agriculture</td>
</tr>
<tr>
<td>• Livestock</td>
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<tr>
<td>• Fisheries</td>
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<tr>
<td>Technology Adoption Component:</td>
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<tr>
<td>• Agriculture</td>
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<td>• Livestock</td>
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<tr>
<td>• Fisheries</td>
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<tr>
<td>Supply Chain Development Component:</td>
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</tbody>
</table>
6.5. Prevention of Negative Social Impacts

6.5.1. Screening Process

It is important to note that the ESMF Toolkit of the World Bank suggests that the ESMF should advise communities and extension teams to try to avoid the need for special planning reports (e.g. EMP, RAP) since they require extra resources (and time) to prepare and indicate less than ideal subproject design. Preparation of such reports may be worth the extra effort for an otherwise excellent subproject. In these cases, the ESMF should specify consultation with the local review authority to confirm the need, and to secure resources, to carry out the work.

The case of the ARTS is straightforward as it does not involve land acquisition and the subprojects concern mainly supporting the small and marginal farmers and women farmers with technologies involving mainly improved management practices. So, there is very little scope to adversely affect any social group. The RAP can be fully avoided and other concerns like inclusiveness, equity, participation and elite capture can be mitigated by proper consultation process and participatory planning and M&E.

However, to ensure that the project meets its main objectives and the relevant safeguards, a set of exclusion criteria will be applied particularly addressing the issue of involuntary resettlement and tribal peoples. For other issues, mitigation measures will be planned and implemented which are discussed in the next section.

The screening process will ensure that:

- The sub projects requiring land acquisition and involuntary resettlement will be excluded.
- Activities likely to adversely affect wildlife, fish habitat, common property resources, livelihoods of marginalized groups etc. will not be included under any sub project.
- The sub projects involving large scale water management projects particularly requiring canal excavation will be avoided as it may involve land acquisition and involuntary resettlement.
- Sub projects requiring constructing permanent structures on private land will be excluded.

The screening process will include a desk appraisal in the Upazila level while consolidating the UP level Micro Plans. The desk appraisal will determine if all relevant information provided adequately by the extension teams and they have considered the probable adverse effects (social and environmental) and included mitigation measures. If the desk appraisal indicates that the proposed subproject may have environmental or social concerns that are not adequately addressed in the application, a field appraisal will be conducted before further processing and clearance of the specific subproject interventions. Table 19 below describes the screening process.
### Table 19: Checklist for screening

<table>
<thead>
<tr>
<th>SL</th>
<th>Issues foreseen in the ARTS</th>
<th>Action needed if answer is yes</th>
<th>Trigger/ Further Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Land acquisition involved, any individual displaced</td>
<td>Reject the intervention</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Access to common property resource of any individual, household, social group affected or restricted such as for fish sanctuary, open water fisheries management, floodplain aquaculture sub projects</td>
<td>Carryout field appraisal</td>
<td>Incorporate remedial measures</td>
</tr>
<tr>
<td>3</td>
<td>Temporary use of public or private land for implementing any sub project such as for installation of buried pipes for irrigation</td>
<td>Carryout field appraisal and consultation between affected and beneficiary groups facilitated by the extension agencies</td>
<td>Based on consultation, workout mutual compensation mechanism as in annex 1</td>
</tr>
<tr>
<td>4</td>
<td>Affecting ecologically sensitive areas such as mangroves in the newly accreted charland or river or embankment side green belt in Blola</td>
<td>Reject the interventions</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Presence of tribal people having distinct identity, distinct territory by ownership or customary rights and distinct language- concentration of minimum 50 tribal households in an UP and 20 in a village</td>
<td>Carry out field appraisal</td>
<td>TPDP</td>
</tr>
<tr>
<td>6</td>
<td>Presence of tribal people with no or nearly diminished identity, no territorial attachment and no distinct language and or concentration less than 50 in an UP and 20 in a village</td>
<td>Carryout field appraisal and ensure inclusion, participation, informed decision making</td>
<td>TPDP</td>
</tr>
</tbody>
</table>

#### 6.5.2 Inclusion and Selection Criteria

**Selection of geographical area: District, Upazila and UP**

Besides the above exclusion criteria, the project may apply several selection or inclusion criteria so that the intended target groups, particularly the weaker and vulnerable ones are not excluded.

The selection process will involve several steps – geographic selection or selection of Upazila and Union followed by selection of beneficiary community, group, individual sub projects and individual beneficiary farmer or household.

As indicated in the project concept note, the project districts and Upazilas are already selected – six ARTS districts and 30 Upazila\(^4\). The Union Parishads are not pre-selected.

\(^4\) The selection of Upazila appears appropriate in five districts but problem was indicated for one district, Sirajganj. A particular Upazila is difficult to be covered from the district town for the location of the Upazila on the other side of the river Jamuna. It can be better supervised from another district town, Tangail. The district level extension agency officers suggested to exclude this Upazila, Chauhali from the ARTs. This could be included under some other project which include Tangail district and it will be possible to supervise it from Tangail. The extension agencies suggested to replace Chauhali of Sirajganj by another Upazila, Ullapara of the same district.
There is a requirement that the UP to be selected has UP Complex building where the FIAC will be located.

After selecting Upazila, it may be required to select Union Parishad which will be followed by selection of communities. Criteria for selection of UP may include:

- Ecological vulnerability – since the project aims to address the needs of the ecologically vulnerable areas, the UPs with high vulnerability should have high priority for inclusion.
- Economic deprivation or poverty - since the project intends to address the needs of the economically deprived areas, the UPs with higher incidence of poverty (by subjective assessment in participatory meeting held at Upazila level) should be given preference.
- Potentials to develop and having unexplored resources in crops, fisheries, livestock– some UPs despite being ecologically vulnerable and economically deprived may have unexplored resources not yet effectively utilized. Such UPs should get preference.
- On-going projects – UPs currently receiving similar support through DAE, DLS and DoF and which is likely to continue after June 2013 should be accorded low priority.
- Recently completed projects – UPs with good result of recently completed project which deserved extension but discontinued and there is potential to use existing infrastructure/ resources/ farmer groups for continued development and having potential to institutionalize should get preference. But if the results are unsustainable, should get low preference.
- Up-coming project – UPs included in projects likely to be approved soon should be excluded.
- Likely cooperation of Upazila and Union Parishad – Upazilas/UPs with good local governance should get preference.

For the selection of UP, the project will need to collate and compile basic information down to UP level like disaster vulnerability (extent of flood damage and tidal surge effects, salinity intrusion, water-logging etc.), poverty (% of households living below the poverty line); current production of major crops, fish, shrimp, poultry, milk etc and their potentials to expand in yield; % of farm households served by ongoing and upcoming projects of similar nature; presence of sustainable CBOs, farmer groups, women groups; and transparent functioning of the LGBs (agricultural projects successfully implemented under Upazila ADP and inter-agency cooperation).

After obtaining the above information the UPs under each selected Upazila will be ranked by each criterion and based on such ranking by groups of independent reviewers will become the basis of UP selection.

**Selection of Communities and Farm Households**

Different communities may have comparative advantage in different agricultural activities – crops, fisheries and livestock. Some may have special interest in various promising technology packages. Considering these, the project will organize farmer groups in the sub village level, separate for crops, fisheries and livestock farmers and special groups for
women farmers. In the areas having concentration of tribal peoples, special groups will be organized for them and this can be mixed male female as women are also largely involved in all types of agricultural activities.

For selection of communities and organizing groups the project will consider:
- Whether the household belongs to the target group, small and marginal farmer not owning above 2.5 acres in minimum 80% CIGs land medium to large farmer owning above 2.5 acres land in maximum 20% CIGs.
- Directly involved in agriculture – not absentee owner leasing out or sharecropping out all land.
- Directly involved in the concerned sub sector, in the case of crop/ fisheries/ livestock groups.
- Belongs to the specific tribe – in the case of tribal peoples’ group.
- Is willing to participate in the concerned farmer group activities.
- The group is not likely to be elite-captured, non-poor are oriented and are fully aware of project objectives, approach and targets so that they help local poor to manage the group without interference but moral support.

The target households will be selected with the consideration that:
- About 80 percent of the CIGs are formed with households owning below 2.5 acres land (small and marginal farmers including sharecropper/ tenant farmers) and maximum 20% may be medium to large farmers owning above 2.5 acres or above.
- About 20 to 30 percent of both CIGs (in the case of SM farmers) and 20-30% of the CIG member (ML farm categories) will be women farmers, preferably, from the female headed households.
- In the case of tribal communities, the CIGs can be mixed comprising both male and female members in case about 20 members from tribal households found in one community. Otherwise, the farmers of tribal households will be included in the CIGs of farmers from the Bangalee society of the same village/area.
- In the case of crops and livestock sub sectors, the CIGs will be different for men and women farmers but in the case of fisheries the CIGs can be gender mixed and also pond size mixed.

6.5.3. Mitigation Measures
The primary target group and beneficiaries for the Technology Adoption and SCD components include: landless households; small and marginal farmers; women farmers and other vulnerable community engaged in agricultural activities including fisheries and livestock. The project beneficiaries include the poor and vulnerable groups such as poor and female headed households and tribal households will also be targeted.

Targeting and Community Participation in the Project
Given the range of activities pertaining to introduction of new technology packages and the nature of the intended target communities, the adoption of a robust and participatory targeting strategy is essential to avoid exclusion of certain groups from benefiting from the project interventions. In order to ensure effective targeting for the component, project beneficiaries will be identified and selected through a process involving community self-identification and selection, with support from - and, where necessary, in cooperation with
local government authorities (e.g. union chairmen/ UP women members) and the technology service providers- the Departments of Agriculture Extension, Fisheries and Livestock (DAE, DOF, DLS) and the SCDC offices based in the field level.

The activities in both components will build strong synergies and will be guided by the approach used successfully by the NATP which comprises:

- Community mobilization, organization and capacity building of small scale and marginal producers into “common interest” groups will follow the decentralized, demand led extension approach.
- Beneficiaries will be identified through a community consultation and field level surveys.
- Where necessary, the existing farmer groups like the IPM and ICM Clubs will be reorganized and reactivated and where necessary, new groups will be organized by the concerned extension agencies.
- Beneficiary groups will in turn be federated into union-level farmer’s associations, called Producer Organizations or POs.

**Social Assessment, Baseline Surveys and Mitigation Measures**

In order to understand the socio-economic make-up of the communities in selected areas and of the specific target groups according to specific criteria and to identify social risks more accurately, a social impact assessment (SIA) will be undertaken at the outset as part of a baseline survey. The SIA will describe the socio-economic baseline such as income, expenditure, employment, education, skills, living standards, utilities, health status and other socio-economic and cultural aspects (gender issues, religious practices, treatment of ethnic minority and tribal groups etc.), local power structures (elites, local government authorities, religious leaders) prevailing in the targeted areas. The findings of the baseline survey will directly inform the targeting process and help design strategies in a more contextualized and effective manner, keeping in mind the local capacities and constraints. This will be further sharpened by undertaking a need assessment among the targeted groups to understand what their expectations and interests are. A market assessment to understand the demand and supply of local goods and services is also important to design successful and sustainable livelihood strategies.

In order to further mitigate for the social risks identified above that may have some negative social impacts, the project will ensure that:

- A built–in system of M&E is established with evaluation indicators for all project interventions.
- Carryout community mobilization, facilitation and capacity building activities by the extension agencies with the participation of the CIGs and POs.
- Design, implementation and monitoring of technological packages will be based on the need identification from beneficiaries of selected villages and UPs.
- Effective identification and selection of targeted community-based groups of marginal and small farmers to benefit
- Supervision of the equitable distribution of benefits to selected farmer groups.
- Effective identification and selection of informal community based groups of landless women farmers to benefit.
• The project will exercise a built-in system of M&E at the micro-level of project activities to ensure that the right groups are identified and targeted for project interventions, and to ensure equity and inclusiveness in the distribution of project benefits.
• The project authority will carry out annual yearly review and prepare annual reports for all components.
• An independent third party monitoring will also be carried out at the end of the first and second years and an evaluation at the EOP in which the annual report will be an input.

**Impact Matrix**
Generally, the impact of the research component will be increased agricultural production and higher income for the farmers in the crops, livestock, and fisheries sub sectors. It is expected to transforming the currently high-risk, low yielding and low-rewarding crop, livestock, and aquaculture production system to comparatively low-risk, high-yielding and better rewarding system.

Expected impacts of the technology adoption component include increased availability of good quality seed of crops, fish fry, fingerlings, AI services and day old poultry chicks—all contributing to higher levels of productivity and farm income. This will also contribute to reduced post-harvest losses for improved storage facilities. The technology adoption component will include improving irrigation efficiency by providing buried and flexible pipes and promoting supplementary irrigation particularly for the aus and aman crops. All these will contribute to increased productivity and farmers' income and welfare.

The supply chain development component intends to provide better prices to farmers by improved marketing, sorting, grading, packing, collection points, and supply of better quality inputs, etc. This will increase profitability of farmers and at the same time improve availability of better quality produce for the farmers at reasonable prices. It will increase particularly the producers' share of the retail price.

While various chapters have so far described the relevant social issues and probable mitigation measures, this section provides a glance look of them in Table 20.
### Table 20: Social Issues, Impacts and Mitigation by component

<table>
<thead>
<tr>
<th>Component</th>
<th>Subjects/ Issues</th>
<th>Issues/ Impacts</th>
<th>Mitigation</th>
</tr>
</thead>
</table>
| **Research** | Study impact of climate change on crop production. Adaptation of crop varieties and management practices for Climate Change vulnerable area | No negative impact foreseen                                                     | 1. Proper breed selection depending on health status of cow and feeding/management capacity of the farmer  
2. Improve cow before introducing hybrid AI service  
3. Help expanding feed and fodder production, management capacity of farmers, healthcare service, vaccination and de-worming etc. |
|           | Improving IPM for better and eco-friendly crop protection                        | No negative impact foreseen                                                     | 1. Proper breed selection depending on health status of cow and feeding/management capacity of the farmer  
2. Improve cow before introducing hybrid AI service  
3. Help expanding feed and fodder production, management capacity of farmers, healthcare service, vaccination and de-worming etc. |
|           | Farming system and farmers' livelihoods security                                 | No negative impact foreseen                                                     | 1. Proper breed selection depending on health status of cow and feeding/management capacity of the farmer  
2. Improve cow before introducing hybrid AI service  
3. Help expanding feed and fodder production, management capacity of farmers, healthcare service, vaccination and de-worming etc. |
|           | Development of varieties                                                        | Affordability of farmers                                                        | Intermediate technology to be preferred |
|           | Soil health nutrition management                                                | Farmers, extension agencies not properly consulted                             | Need to identify research topics in consultation with the extension agencies and farmers |
|           | Livestock productivity and protection against diseases. Fisheries brood development (marine & fresh water) | Farmers, extension agencies not properly consulted                             | Need to identify research topics in consultation with the extension agencies and farmers |
|           | 46 CGP sub projects                                                            | Need to identify priority topics                                                | Participatory workshop |

<table>
<thead>
<tr>
<th><strong>Technology Adoption</strong></th>
<th>Issues</th>
<th>Impacts</th>
<th>Mitigation</th>
</tr>
</thead>
</table>
| Who receives supply: SM farmers usually lack access          | Marginalized groups excluded                                           | 1. Inclusion and exclusion criteria clearly defined and compliance effectively and externally monitored  
2. Farmers group have strong representation of the marginalized groups |
| For Whose benefits?                                        | Marginalized groups excluded                                           | 1. Inclusion and exclusion criteria clearly defined and compliance effectively and externally monitored  
2. Farmers group have strong representation of the marginalized groups |
| GoB hatcheries (fish and poultry) may not operate on a regular basis for inflexible bureaucratic procedures | Irregular supply and farmers may become disinterested                  | 1. Provide revolving fund to the Fish Seed Multiplication Farms of the DoF.  
2. Keep provision for the production and supply of quality fish fry by competent NGOs |
| Most (80%+) households have backyard poultry and 20%+ duck farmers unlikely to benefit | Backyard poultry/duck farmers, mostly women, are deprived of the benefits | Help improving backyard poultry raring using semi scavenging method etc as already introduced by Danida in greater Barisal (FFS). Provide vaccination service involving farmer groups making and implementing production and vaccination plan. |
| AI expansion over the last half century did not contribute much to breed upgrading mainly for feed, fodders, farm management and healthcare problems | Will bring little change                                              | 1. Proper breed selection depending on health status of cow and feeding/management capacity of the farmer  
2. Improve cow before introducing hybrid AI service  
3. Help expanding feed and fodder production, management capacity of farmers, healthcare service, vaccination and de-worming etc. |
| SM farmers, women farmers, tribal people not adequately reached | Marginalized groups excluded                                           | 1. Inclusion and exclusion criteria clearly defined and compliance effectively and externally monitored  
2. Farmers group have strong representation of the marginalized groups |
<table>
<thead>
<tr>
<th>Component</th>
<th>Subjects/ Issues</th>
<th>Issues/ Impacts</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who to operate and maintain CIG/ PO activities after closing the project: past experience not encouraging</td>
<td>May become unsustainable</td>
<td>1. Find alternative arrangement. 2. Contractual arrangement of farmer groups with BADC seed store facilitated by the project. 3. Contractual arrangement with NGO/ private facilities for supply line of fish fry</td>
<td></td>
</tr>
<tr>
<td>Increased use of pesticide, chemical fertilizer</td>
<td>Depletion of fisheries resources</td>
<td>Promote IPM, green manure, vermi compost.</td>
<td></td>
</tr>
<tr>
<td>SM farmers, women farmers, indigenous people not adequately reached</td>
<td>Marginalized groups excluded</td>
<td>1. Inclusion and exclusion criteria clearly defined and compliance effectively and externally monitored 2. Farmers group have strong representation of the marginalized groups</td>
<td></td>
</tr>
<tr>
<td>Elite capture of CIG/ PO</td>
<td>Marginalized groups excluded</td>
<td>1. Inclusion and exclusion criteria clearly defined and compliance effectively and externally monitored 2. Farmers group have strong representation of the marginalized groups</td>
<td></td>
</tr>
<tr>
<td>Technology Adoption (Installation of buried pipes)</td>
<td>Temporary use of land for installation of buried pipes</td>
<td>Loss of crops during construction in limited number of cases</td>
<td>1. Need effective community consultation between land adjoining owners/ affected persons and water users/ beneficiary farmers. Often they may be same group of people and kin groups. 2. List affected and benefited households, estimate damage, and make arrangement for mutual compensation. 3. The extension agencies will facilitate but the main responsibility will remain with the CIGs/ POs.</td>
</tr>
<tr>
<td>SCDC</td>
<td>Health safety</td>
<td>Use of chemicals, too much of insecticides, ripening materials, formalin etc.</td>
<td>1. Promote IPM/ ICM 2. Promote indigenous methods of preservation of fruits, vegetables, onion, chili, betel leaves, ginger etc. 3. Promote indigenous methods of ripening fruits and tomato</td>
</tr>
<tr>
<td></td>
<td>Pollution of air, soil, water by excessive use of chemical fertilizer and pesticides</td>
<td>Aquatic biodiversity and fisheries resources depletion</td>
<td>4. Promote IPM/ ICM</td>
</tr>
</tbody>
</table>

### 6.6 Land acquisition and resettlement

Broadly, the project will not require land acquisition hence there is no issue of resettlement. Since the project duration is only three years, it is has totally avoided land acquisition and physical construction.

Also, the project will not include excavation or re-excavation of canals, although there is high need for it and many GIGs and POs may request the extension agencies to support in this regard. This should be avoided considering that the project duration is only three years.
and fund is very limited. If some other agencies like the LGED and the BADC are involved in the excavation or re-excavation of canals in the same area, the DAE may assist the concerned CIGs and the POs to contact such agencies for inclusion of the area under such projects.

In the technology adoption component, the surface water irrigation is highly emphasized and it is particularly important in the case of supplementary irrigation for the Aus and Aman paddy and minor crops. For Aus and Aman, supplementary irrigation using surface water is economic and environmentally sound. In the southern districts, particularly in Bhola and Gopalganj, it is highly feasible even for Boro.

One approach in the technology generation component is to improve efficiency of irrigation by reducing leakage of water in the surface drains and for that purpose the installation of buried pipes and flexible pipes are suggested. For this purpose no land acquisition will be needed. For buried pipe, there will be a need for consultation between farmers of the adjoining land and the water users, who are likely to be the same farm households most often but can be different households in some cases. In such case, the owner and user groups must agree to certain alignment of the pipeline, the location of the pump and the pits and if some owner/farmer is affected, such as by damage of crops, they should be compensated by the user group. This is less relevant to flexible pipe but in case any farmer is adversely affected by temporary damage of crops, they should be compensated by the user group.

Before approving any sub project that will include installation of buried pipes, the DAE with the full involvement of the concerned CIGs and POs should make an inventory of the likely affected households and the beneficiary households with their socio-economic profile and the quantification of probable temporary damage to crops. The user group and the landowner group will then be consulted and facilitated to reach an agreement in writing. On the basis of such consensus the buried pipe installation and distribution of the flexible pipe will be endorsed in the Union micro plan.

It seems that resettlement exercise may be needed only in the case of the installation of buried pipes. It should be noted that the resettlement policy framework applies if:
- There is need for relocation, loss of shelters or access to assets;
- Loss of income source or livelihoods; or
- Loss of access to locations that provide higher income opportunities.

The ARTS interventions will not involve relocation or loss of shelter and not even access to assets and common property resources. These will be avoided but there is a need for documenting that the concerned people, both affected and beneficiaries are consulted and they agree after informed consultation to execute the interventions like buried pipes. To ensure compliance of this process, the FIACs and Extension agencies in the Upazila level will document for the involved sub project sites a field assessment, called Social Impact Assessment to identify the project beneficiaries as well as affected people. The results of the community consultation will be a decisive element in selection of the design, size and location of the sub projects.
The documentation of community consultation concerning installation of the buried pipes for example, will comprise:

i) Making a list of affected and beneficiaries. Since many of the affected landowners and beneficiary farmers will be common, a common list will be prepared and checked for affected or benefited in two columns.

ii) A valuation of crop loss for the use of land during the installation of the buried pipes and constructing the pits etc.

iii) Description of compensation needed and the arrangement of mutual compensation.

iv) Consultation with PAPs and the beneficiaries.

v) An agreement reached and documented in writing by the facilitation of the extension agency.

vi) Implementation arrangements for Grievance Redressal Procedures

vii) Arrangements for M&E

viii) Timetable and Budget and source of fund, who to contribute what, mutually.

6.7 Tribal Peoples Management Framework

Government of Bangladesh does not officially use the term “indigenous people” but calls such people as “small ethnic community” or “tribe” and can legally safeguard their interests as special assistance to “backward section of the people”. As part of SMF, a Tribal Peoples Management Framework (TPMF) is presented here for the ARTS as a whole. The TPMF aims at enhancing participation of the tribal people or small ethnic community people, whatever the term used, throughout the project cycle. The general objective of the TPMF is the inclusion of TP in the project in order to achieve the highest possible positive impact of the interventions to improve their quality of life. The specific objectives of the TPMF are to ensure that: (a) works project interventions are culturally appropriate (b) works and services provided do not inadvertently induce inequality by limiting project benefits to the elite elements of the community, (c) the project engages with communities through a consultation process appropriate to the local cultural context and local decision making process; and (d) establish appropriate information communication and training strategies with the different TPs and communities in all stages of the project.

This framework is based on World Bank’s Operational Policy 4.10. Based on the principal objectives of the TPMF, the ARTS will:

(i) Ensure that project carries out free, prior, and informed consultation with the indigenous community wherever they are affected or has opportunity to be benefited;

(ii) Ensure that project benefits are accessible to the tribal community people living in the project area and are engaged in or are willing to be engaged in any agricultural activities in crops, livestock, fisheries and supply chain development;

(iii) Avoid any kind of adverse impact on the indigenous community to the extent possible and if unavoidable ensure that adverse impacts are minimized and mitigated;

(iv) Ensure indigenous peoples participation in the entire process of preparation; implementation and monitoring of the sub project activities;

(v) Minimize further social and economic imbalances within communities; and

(vi) Develop appropriate training / income generation activities in accordance to their needs and priorities.
As part of the TPMF for the project, the ARTS will assess in the beginning of the project in each selected Upazila by consultation with the extension agency officials, the local government representatives, local NGOs and civil society organization whether there is any concentration of tribal people in any UP or village. In case even a small concentration of 20 or more tribal household involved in any agricultural occupations (crops, livestock, fisheries) and 50 or more in an UP, the particular UP and village will be included on a priority basis in the ARTS project. This will also document for the concerned Upazila and the compiled to the district and the ARTS as a whole, what the tribal communities are, a brief history of them, their language, culture, education, past and present occupation pattern, any special attachment to distinct habitat or ancestral territory and to common property resources like beel/ jolmohal, and if there is any possibility of affecting such resources or access to such resources by the TPs and if so what remedial measures can be incorporated in the ARTS.

**TPDP**

Based on the TPMF and on the assessment the need for a Tribal Peoples Development Plan (TPDP) will be established. This will be checked by using the matrix provided in Table 18 above. For the UPs identified to have concentration of TP, the TPDP will be prepared by the extension agencies in cooperation of the concerned CIGs and POs. This will be done one per involved UP to ensure that the TPs are consulted and their participation is ensured rather than excluded.

The TPDP for the involved UPs will comprise:

v) Making a village wise list of TP households with the name of household head, ownership of land, tenancy, main and secondary occupations and likely involvement in the ARTS activities under crop, fisheries, livestock, SCDC;

vi) An assessment of probable positive and negative impacts of any sub project proposed in the UP level micro plan;

vii) Suggest mitigating measures; and

viii) Arrangements for M&E

A more detailed outline of a TPDP is provided in the annex.

**6.8. Gender Assessment Framework**

Mainstreaming gender equity and empowerment is already a focus area in the project. In the sub projects under the Technology Adoption and the SCD components will address women’s needs with priority and will create opportunities for participation in the CIGs and POs. A Gender Assessment Framework (GAF) is provided below as part of SMF which will help analyze gender issues during the preparation stage of sub project and design interventions. At the sub project level, gender analysis will be part of the social assessment and the analysis will be based on findings from gender specific queries during primary data collection process and available secondary data. The quantitative and qualitative analysis will bring out disaggregated data and issues related to gender disparity, needs, constraints, and priorities; as well as understanding whether there is a potential for gender based inequitable risks, benefits and opportunities. Based on the specific interventions will be designed and if required gender action plan will be prepared. The overall monitoring
framework of the project will include gender desegregated information and relevant indicators.

Gender analysis will be an integral part of the social impact assessment in ARTS sub projects. The project design will be gender responsive based on the gender analysis. The findings and recommendations from the gender analysis during project planning and feedback from beneficiaries during implementation will be discussed thoroughly to determine the need for further action. Listed below are the key action points:

**General Checklist**

- Identify key gender and women’s participation issues.
- Identify the role of gender in the project objectives.
- Prepare terms of reference (TOR) for the gender specialist or social development specialist of the client
- Conduct gender analysis as part of overall Social Impact Assessment.
- Draw up a socioeconomic profile of key stakeholder groups in the target population and disaggregate data by gender.
- Examine gender differences in knowledge, attitudes, practices, roles, status, wellbeing, constraints, needs, and priorities, and the factors that affect those differences.
- Assess men’s and women’s capacity to participate and the factors affecting that capacity.
- Assess the potential gender-differentiated impact of the project and options to maximize benefits and minimize adverse effects.
- Identify government agencies and non-governmental organizations (NGOs), community-based organizations (CBOs), and women’s groups that can be used during project implementation. Assess their capacity.
- Review the gender related policies and laws, as necessary.
- Identify information gaps related to the above issues.
- Involve men and women in project design.
- Incorporate gender findings in the project design.
- Ensure that gender concerns are addressed in the relevant sections (including project objectives, scope, poverty and social measures, cost estimates, institutional arrangements, social appendix, and consultant’s TOR for implementation and M & E support).
- List out major gender actions.
- Develop gender-disaggregated indicators and monitoring plan.

**Specific Checklists to be covered during various stages of project cycle include:**

**Desk review**

- Review available information (e.g., statistics, gender analysis, documents of previous projects) in the project area and the socioeconomic profile of the target population.
Review the relevant legal (e.g., inheritance law), policy (e.g., National Women’s Development Policy), and institutional framework (e.g., current administrative system for land acquisition, compensation disbursement) and their gender implications.

**Household surveys**
- Draw up gender-disaggregated socioeconomic and cultural profiles and identify the constraints, and needs of the target population.
- Collect quantitative information.

**Participatory methodologies** (e.g., participatory rapid appraisal, focus group discussions, random interviews, walking tours)
- Collect qualitative information which cannot be collected through surveys.
- Define ways in which men and women beneficiaries and other stakeholders, especially poor women can participate in the project.
- Map out the target areas. Which are the most disadvantaged areas in terms of access to services and poverty level?
- Identify major stakeholder groups and their stake.

**Staffing**
- Ensure adequate gender balance in field teams.
- Select field team members with gender awareness, local knowledge, cultural understanding, and willingness to listen.

**Data to Be Collected**

**Macro institutional framework**
- Gender impact of sector policy; legal and institutional framework.
- Executing agency’s capacity and commitment to participatory approaches and gender focus.

**Socioeconomic profile**

*Demographic*
- Composition by gender, ethnicity/caste, age, etc.
- In and out migration trend (male and female)
- Percentage of households headed by females
- Household size
- Age at marriage, by gender

*Economic*
- Income level and sources, by gender
- Expenditure patterns and decision making, by gender
- Land tenure and use, by gender
Health
✓ Population growth rate
✓ Infant and maternal mortality rates
✓ Service availability
✓ Fertility level and decision making
✓ Food allocation and nutrition level within households, by gender
✓ Incidence of domestic violence

Education
✓ Literacy and school enrolment ratios, by gender
✓ School dropout ratio, by gender
✓ Child labour, by gender

Status of women
✓ Political representation and awareness
✓ Socio-cultural perceptions and practices of men and women
✓ Gender-discriminatory policies and laws
✓ Gender roles and responsibilities
✓ Broad gender division of labour in productive (e.g., agriculture, income-generating activities) and reproductive (e.g., household chores, child care) responsibilities, and time allocation for each responsibility

Fuel and Fodder
✓ Availability, quantity, and quality of fuel and fodder
✓ Time spent on collection of these resources by men, women, and children
✓ Are there seasonal differences in availability, quantity, or quality?

Water
Drinking water
✓ What sources (e.g., public streams, rivers, tanks, lakes, communal wells or tanks, ponds, privately owned wells or tanks, water pipes) are used?
✓ How far away are the water sources?
✓ Water collection and storage
✓ Who collects and stores water? How?
✓ How much time is spent in water collection and storage?
✓ Who carries water and how?
✓ How much time is spent transporting water?
✓ Are there any health hazards resulting from the transport of water?
✓ How is the collected water used differently by men and women (e.g., for cooking, sanitation, home gardens, livestock)?
✓ Who decides the allocation?
✓ Is water available in the dry season?
✓ How is water use managed during the water-scarce season? By whom?

Roles in agricultural water
✓ Who collects, transports, and manages water for agricultural use and how?
✓ Is there any conflict between agricultural and domestic water allocation? How can these needs be prioritized?
Are there conflicts in water distribution in general, based on gender, income level, ethnicity/castes, etc.? How can these be solved?

Who is responsible for the upkeep of the community water infrastructure?

Who could be key informants?

Are there significant differences in responsibilities based on gender, income level, or ethnicity/caste?

Access, control, constraints

- How do men and women differ in their access to and control of land, agricultural inputs, extension, markets, employment opportunities, and credit?
- Is external assistance provided to improve access/control? By whom?

Participation

- What factors affect the level of men’s and women’s participation?
- What are the incentives and constraints?
- During which season is the demand for labour highest?
- Which modes of participation do men and women favour (e.g., decision making in planning, cash contribution, labour contribution for construction, training, financial management, organizational management)?

Project impact

- Do men and women perceive positive and negative impacts of the project differently?
- Are the benefits likely to be distributed equitably?
- How can negative effects be mitigated?
- Are there any disadvantaged or vulnerable groups?
- Who are they? Where do they live? What are their socioeconomic characteristics?
- How will the project affect these groups?
- Land acquisition/Resettlement: Extent of land to be acquired
- What are the gender-specific implications?

Organization

- What is the current level of women’s representation in other community decision-making bodies?
- Are there local organizations (e.g., local governments, national NGOs, CBOs, mass organizations) that address women’s constraints and needs? How can the project link up with them?
- What mechanisms can be used to ensure women’s active participation in project activities?
- What organizations can be used to mobilize and train women in the project activities and livelihood options?
- Incorporate the preferences of community men and women on issues such as: number and location of assets and sharing vs. individual arrangement of assets;
- Highlight women’s strengths in mobilizing savings and resources.
- Incorporate the preferences of men and women in the community on:
  - financing arrangement
  - possible preferential treatment for very poor, female-headed and other disadvantaged families
  - credit or community-based revolving funds for women SHGs
Community participation mechanism

- Develop a participation strategy for men and women during project implementation and M & E.
- Avoid overly high expectation of women’s participation and develop a practical schedule, as women often have time and financial constraints. The strategy should incorporate the following:
  - Planning: Conduct women specific consultation to take their views and suggestions on the design. Any mechanism established during the project design such as grievance mechanisms should have adequate representation from women.
  - Construction: Ensure work conditions that are conducive to women’s participation (e.g., gender-equal wage rates, construction season, toilet and child-care facilities).

Monitoring and evaluation (M & E): Develop a feedback mechanism in which both male and female have a voice. Identify organizations that could facilitate women’s participation during implementation and M & E.

Training options

- Identify ways to link up with income-generation, literacy, and other activities to support an integrated approach to poverty reduction and women empowerment
- Support a decentralized structure to allow linkages between the village and local government.
- Include financial and technical capacity building for relevant local government bodies to enable them to effectively support women SHGs.

Monitoring and evaluation

- Develop M & E arrangements: (i) internal M & E by project staff; (ii) external M & E by NGOs or consultants, as necessary; and (iii) participatory monitoring by beneficiary men and women.
- Disaggregate all relevant indicators by gender such as number of women gaining access to credit, increase in women’s income, and career prospects for project trained women.

Documentation

Document the gender-responsive design features in the DPR and include covenants in the loan agreement to ensure gender-sensitive project design mechanisms to be complied by the executing agency

6.9. Disclosure

The Draft SMF will be made available for public consultation by the implementing agencies, with key portions translated in Bangla. It will be displayed at places accessible to affected people, primary stakeholders and members of the civil society. It will also be available at all offices of the involved executing agencies and the MOA and NATP and the World Bank websites. Comments will be invited from all. Once all comments have been addressed, the Bank will disclose the document publicly. After the Bank finally approves the document the implementing agencies will once again make the final version publicly available with key portions translated in Bangla, electronically on their respective websites and place hard-copies in easily accessible places. Information about these locations will be advertised in local newspapers (English and Bangla).
7. Institutional Arrangement and M & E Framework

7.1. Institutional Arrangement

7.1.1 The GOB System

The GoB ministries involve in the project for overall direction, periodic monitoring and oversight are the Ministry of Agriculture for the crop sub sector and the SCDC, the BARC for the research component, and the Ministry of Fisheries and Livestock for the fisheries and livestock sub sectors.

The three components of the project involve several implementing agencies under the two abovementioned ministries. The research component involves (a) Bangladesh Agriculture Research Institute, (b) Bangladesh Rice Research Institute, (c) Bangladesh Institute of Nuclear Agriculture, (d) Bangladesh Livestock Research Institute, (e) Bangladesh Fisheries Research Institute, and (f) Bangladesh Agriculture Research Council (as apex body of the NARS), four under the Ministry of Agriculture and two under the Ministry of Fisheries and Livestock.

The implementing agencies involved in the Technology Adoption Component are (a) Department of Agriculture Extension, (b) Department of Fisheries and (c) Department of Livestock Services are involved in the Technology Adoption component.

The Supply Chain Development component will be implemented by the Hortex Foundation under the Ministry of Agriculture.

Apart from the above, several other ministries and divisions of the government are involved in the project planning and implementation process including the (a) Ministry of Finance, (b) Economic Relations Division, (c) Planning Commission, and (d) Implementation Monitoring and Evaluation Division of the Ministry of Planning.

7.1.2 Implementation and Coordination Mechanism

To manage this multi sub-sector and multi-agency project the GoB has a Project Steering Committee for the NATP headed by the Secretary, Ministry of Agriculture and co chaired by the Secretary, Ministry of Fisheries and Livestock. No separate Steering Committee is proposed for the ARTS to avoid administrative complexities. Other members of the PSC include representatives of the Ministry of Finance (Finance Division and ERD), Ministry of Planning (Planning Commission and IMED), and representatives of all implementing agencies (BARC, BARI, BRRI, BINA, BFRI, BLRI, DAE, DLS, DoF and Hortex Foundation). The PSC may also include representatives of selected NGOs and private sector (seed companies etc.). Names of NGOs and private sector organizations to represent need not be mentioned as it can follow the NATP. Representation of farmer organizations, one from each ARTS district and four from specific sub sectors (crops, fisheries, livestock and SCDC) should be included in the PSC. The farmer representatives will be nominated by the federation of farmer groups at a later stage which may initially be proposed for a limited period by the concerned executing agencies, and such names should come through district level ECC.
The PSC which will meet at least twice a year to review progress and approve half yearly plans, propose allocations for the ADP/RADP and provide needed guidance for project implementation. Joint Chief, MOA will act as Member Secretary to the PSC and the MOA will provide secretarial service to the committee.

Besides the PSC, there will be a Project Implementation Committee (PIC) to be headed by the Additional Secretary, MOA. The PIC will comprise the PCD of the NATP and the component heads (PD, NATP) from the concerned executing agencies.

The MOA will arrange issuance of notification relating to the formation of the PSC and the PIC along with the Terms of Reference and List of Members/representatives.

The field level implementation and coordination will follow the same arrangement as is done in the NATP. The district level DPICs will be headed by the District Agriculture Officers which will be represented by the district level officers of all implementing agencies (DAE, DLS, DoF in all districts and Hortex where applicable). The DPIC will also have representatives of the partner NGOs and private sector. The DPIC will be strongly represented by farmer organizations – representing SM farmers, women farmers, aquaculture farmers, poultry and dairy farmers etc. all nominated by the respective farmer group federations. The office of the District Agriculture Officer, DAE will provide secretarial service to the committee. The DPIC meetings will be attended by the Upazila heads of DAE, DLS, DoF and Hortex (where applicable).

The DPIC meetings will be held quarterly to review progress and plan for the next crop season, year in a participatory manner and to be transparent.

7.2 Monitoring and Evaluation Framework
Because of multi sub sector and multi agency involvement in the project, the management responsibilities vested in several ministries, implementing agencies and LGBs, it requires a very comprehensive monitoring framework. Further, the project’s target of reaching the ultimate beneficiaries is rather complex to be monitored effectively. The project will therefore have a monitoring framework comprising both internal and external monitoring systems.

It should be emphasized here that the GoB has a monitoring system where the concerned ministries monitor and review progress of individual projects on monthly and quarterly basis. The GoB has a set of very detailed monitoring formats developed by the IMED who periodically review progress and report to the Executive Committee of the National Economic Council.

The monitoring system and formats are however quite complex and need further simplification so that the project management can report without facing much difficulty and without spending much time in reporting and thus affecting actual achievement of the project.
In donor assisted projects, the PDs are required to prepare another set of reports for the donor, apart from one for the IMED. Ideally, the IMED reporting format should have been able to serve the purpose of both GoB and donor but this is unlikely to happen soon and is outside of the scope of this project. However, the project can try to make M&E format simple enough so that most information can be obtained from the IMED report and limited extra ones provided by the project.

7.2.1 Internal Monitoring
The project will submit reports in IMED formats to the respective ministries and the concerned ministries will forward the reports to the Planning Commission and IMED.

While the IMED reports tend to focus activities and financial progress against allocations under each budget line, and also provides an overview of physical progress in percentage terms – it says little or nothing about achievements of output targets and meeting objectives. There is difficulty of understanding the complex formats and they are often filled up to meet up requirements and deadlines under extreme pressure from above.

Therefore, for the use of the PSC, the PCD will prepare consolidated reports for all components and submit it to the MOA with copies to MoFL, Planning Commission, ERD and World Bank. The MOA after scrutiny and approval by the PSC will submit it to the World Bank with copies to Planning Commission, ERD and MoFL. The project will provide a very simple format prepared by competent M&E experts.

7.2.2 External Monitoring and Evaluation
While the internal monitoring is likely to provide the needed financial progress data, external monitoring will focus more on the implementation process, problems, constraints and achievement of output and outcome against the respective targets.

External monitoring and evaluation will be conducted by independent experts or organizations under contract with the World Bank. This fund will not be channelled through any implementing agency to avoid any scope of being influenced.

The external monitoring and evaluation will specifically assess
- Whether the broader objectives of the project and of each component are met, what difficulties are there and suggest corrective measures
- Whether the project impacts on key social, economic and environmental indicators show positive trend, what difficulties are there and suggest corrective measures
- Whether the project strategy of inclusiveness, participation, transparency, public accountability and equity etc. are followed specifically in technology adoption and water management components.

7.2.3 Monitoring Strategy
Monitoring in the ARTS should be done in a participatory manner and should be a bottom up process. The participants in monitoring and evaluation particularly in the case of reporting the grassroots level activities, output and outcome the respondents should include farmers, farm women and other primary stakeholders. Self monitoring by the community
with the facilitation of the extension agencies will be a main input to both internal and external monitoring. To enable the extension agency field level officers, the project will provide training, guidance and simple formats.

7.2.4 Monitoring Indicators
The monitoring indicators will include a set of process indicators noted below and another set of impact indicators detailed in Table 21.

Process Indicators:
- Community and Beneficiary Selection – criteria set, Upazila and UP identified
- Stakeholder consultation and disclosure completed
- Mainstreaming of vulnerable communities – strategies developed to improve their livelihoods incorporated in the project design
- Increasing the role of women in the target communities - strategies developed to improve their livelihoods incorporated in the project design
- Strengthening local institutions – LGB, CIGs, POs, - mechanism for their capacity enhancement incorporated in the project design
- Cost and Benefit Sharing and Sustainability - mechanism incorporated in the project design
- Develop local ownership of the programme - mechanism incorporated in the project design
<table>
<thead>
<tr>
<th>Sub Sector</th>
<th>Change Area</th>
<th>Indicators</th>
<th>Frequency to Monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal Level</strong></td>
<td></td>
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<tr>
<td>Economic &amp; Social Change</td>
<td>Income increase</td>
<td>Farmers’ real income increase by 5-10%</td>
<td>EOP Evaluation</td>
</tr>
<tr>
<td></td>
<td>Literacy</td>
<td>Primary school dropout decrease from about 30% to about 20%</td>
<td>EOP evaluation</td>
</tr>
<tr>
<td></td>
<td>Women’s empowerment</td>
<td>33% of the farmer group executives are women (in the CIG and PO)</td>
<td>Yearly external review and project’s annual report</td>
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<tr>
<td></td>
<td>Seasonal Out migration</td>
<td>Number of households with seasonal out migrant workers decrease by 10%</td>
<td>EOP evaluation</td>
</tr>
<tr>
<td><strong>Outcome Level</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Crops</td>
<td>Yield per ha</td>
<td>Rice, Maize, wheat, oilseeds, pulses, spices yield increase by 10% for the target CIG farmers and 5% for non CIG farmers</td>
<td>Yearly external review and project’s annual report</td>
</tr>
<tr>
<td></td>
<td>Area increase</td>
<td>Area under ARTS promoted crops increase by 20% for the CIG farmers, 10% for non-CIG farmers</td>
<td>As above</td>
</tr>
<tr>
<td></td>
<td>Cropping Intensity</td>
<td>Cropping Intensity increase by 5% points in the target Upazilas</td>
<td>As above</td>
</tr>
<tr>
<td>Pond Fishery</td>
<td>Yield per ha</td>
<td>Fish yield for the CIG farmers increase by 10% and for non-CIG farmers by 5%</td>
<td>As above</td>
</tr>
<tr>
<td></td>
<td>Area increase</td>
<td>Aquaculture area in the target Upazilas increase by 10%</td>
<td>As above</td>
</tr>
<tr>
<td>Livestock and poultry</td>
<td>Milk yield</td>
<td>Yield per local cow/day increase from 1.0 lit to 1.2-1.5 litre for CIG and non-CIG farmers respectively Mild yield of cross-breed cow increase by 20% for CIG farmers and 10% for non-CIG farmers</td>
<td>As above</td>
</tr>
<tr>
<td></td>
<td>Health of cattle, and goat</td>
<td>Visible health of cattle and goat improved, % of ill health and underweight cattle and goat reduced from about 80% to 50-60% in the ARTS districts</td>
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<td></td>
<td>Egg production</td>
<td>Egg per backyard poultry increase from 40 to 50/yr</td>
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<td></td>
<td>Chick survival</td>
<td>Backyard poultry chick survival up to age 3 months increase from 20-30% to 40%</td>
<td>As above</td>
</tr>
<tr>
<td></td>
<td>Poultry farm</td>
<td>Number of poultry farmers in the target group increase by 20%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Productivity of broiler and layer farms</td>
<td>Productivity of broiler and layer farms increase by 20%</td>
<td>EOP external evaluation</td>
</tr>
</tbody>
</table>
### SCDC

**Vegetables, fruits, flower**

Producer's share of retail price (farm gate price) increase from about 50% to about 60%

**External review and annual report**

### Cross-cutting

**Women's participation**

20% of the beneficiary group members are women, 33% of the CIG/PO leaders are women

**Yearly external review and Project's Annual Report**

**Tribal people**

TP in the target Upazilas are included where such communities have visible presence, 20+ HH in any village or 50+ HH in any UP

**SM Farmers**

At least 80% of the male group members are SM farmers including about 10% tenant farmers/sharecroppers

**Small pond operators**

80% of the ponds under aquaculture support are below one acre including 60% not above one bigha.

**Backyard poultry, livestock**

80% of the livestock CIGs are backyard poultry or livestock farms (below 20 adult birds, below 5 cows or 10 goats).

### Output Level

<table>
<thead>
<tr>
<th>Sub Sector</th>
<th>Change Area</th>
<th>Indicators</th>
<th>Frequency to Monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Research</strong></td>
<td>SPGR</td>
<td>Number of ARTS supported research sub projects identified based on field needs as proposed by the extension agencies. Numbers implemented in time and result reached the farmers and accepted by the farmers</td>
<td>Yearly external review and Project's Annual Report</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of ARTS assisted sub projects reached technology to the farmers in the coastal/wetland/climate change affected areas in the ARTS districts</td>
<td>As above</td>
</tr>
<tr>
<td></td>
<td>CGP</td>
<td>Number of ARTS supported research sub projects identified based on field needs as proposed by the extension agencies. Numbers implemented in time and result reached the farmers and accepted by the farmers</td>
<td>As above</td>
</tr>
<tr>
<td><strong>Technology Adoption</strong></td>
<td>Crop Seed/ Fish Fry, Fingerling</td>
<td>Quantity of seed, fry and fingerling supply to farmers of assured quality increase to 20% of farmers from 5-10%</td>
<td>As above</td>
</tr>
<tr>
<td></td>
<td>Fertilizer quality</td>
<td>Number of samples collected, tested of TSP/MP etc. 50 per district/year</td>
<td>As above</td>
</tr>
<tr>
<td></td>
<td>Soil quality test</td>
<td>Number of samples collected, tested 100 per district/year</td>
<td>As above</td>
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<tr>
<td></td>
<td>Soil health improvement</td>
<td>Number of farmers accepted vermin compost and other improved methods of producing green manure and quantity produced by type</td>
<td>As above</td>
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<td></td>
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<td>% of cow-dung diverted from use as fuel</td>
<td>As above</td>
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<tr>
<td>Activity</td>
<td>Description</td>
<td>Target</td>
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<td>------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
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<tr>
<td>Animal feed</td>
<td>Number of farmers and area under fodder cultivation</td>
<td>As above</td>
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</tr>
<tr>
<td></td>
<td>Number of farmers accepted technologies of urea molasses straw, silage, green grass of maize plant storage etc.</td>
<td>As above</td>
<td></td>
</tr>
<tr>
<td>Feed quality for poultry, fish etc.</td>
<td>Number of farmers producing and procuring feed of desired quality and quantity produced and procured by type</td>
<td>As above</td>
<td></td>
</tr>
<tr>
<td>Day old poultry and chick</td>
<td>Supply of day old poultry and chick from GoB hatcheries to target farmers increase by 20%</td>
<td>As above</td>
<td></td>
</tr>
<tr>
<td>AI service for cows</td>
<td>AI service to the target farmers increase by 25% (cows covered by AI)</td>
<td>As above</td>
<td></td>
</tr>
<tr>
<td>Number of Adopters of recommended technology</td>
<td>CIG farmers by sub sector, Male, Female separately, and non-CIG adopters by sub sector, male and female</td>
<td>As above</td>
<td></td>
</tr>
<tr>
<td>Irrigation efficiency</td>
<td>Area irrigated (ha) per STW/ LLP increase by 20% from 2 ha to 2.4 ha for boro</td>
<td>As above</td>
<td></td>
</tr>
<tr>
<td>Supplementary irrigation</td>
<td>Area covered increase by 20% in Aus and Aman seasons.</td>
<td>As above</td>
<td></td>
</tr>
<tr>
<td>Buried pipes installation</td>
<td>Number of CIG, Number of locations and length of pipe (meter)</td>
<td>As above</td>
<td></td>
</tr>
<tr>
<td>Supply of flexible pipes</td>
<td>Number of CIG, Number of locations and length of pipe (meter)</td>
<td>As above</td>
<td></td>
</tr>
</tbody>
</table>

### 7.2.5 Participatory Monitoring and Evaluation (PME)

The project will mobilize and strengthen representative community groups (CIG) that will play an active role throughout implementation and contribute to the sustainability of the project. The project’s monitoring system will seek to go beyond the simple extraction of information from these groups, to a participatory process where stakeholders at the community level will be involved in measuring results, evaluating achievements, and learning from the project experience (as joint originators and evaluators of information). This will also help build local capacity to identify and analyze problems, to propose solutions, to take actions, and it will also give voice to small and poor farmers. The PME system is expected to tap into the local knowledge of farmers and their proximity to project activities. It will help beneficiaries to keep track of implementation progress while building a sense of ownership among them. The PME system is also expected to transfer technical knowledge to farmers that participate in monitoring and evaluation.

Under the PME, community members will collaborate with project staff to review and monitor schedules, collect data, and ensure that quality goods and services are delivered in a timely manner. These arrangements will facilitate quick corrective actions because communities are the first to see problems and often know the best remedy.
Use of social accountability structures and tools. The participatory nature of the project is meant to create positive social capital at the local level to allow for change and development. The project will use community scorecards at regular intervals to assess the performance of the executing agency. The community scorecards will also be used to assess the performance of project staff, government functionaries, and private suppliers of goods and services. To check the quality of financial management systems, and to guard against any corrupt activities, social audit will be used during the project.

7.3. Grievance Redressal System

To address the grievances, the project will have two tier grievance redress mechanism (GRM). As first tier of GRM, an officer will be designated as project facilitator at the Upazila level who will be the first level contact for an aggrieved person. On a fixed date of every month, the facilitator will visit the village/ CIGs where individuals / community will approach the project facilitator. This will be in addition to complaint books kept at the CIG, FIAC and UP Information Centre and which will be entertained by the facilitator the same day in the field level. That apart, the project sties will have information board with the (i) name of the Sub Project; (ii) name of the project facilitator; district level officer responsible for social management, (iii) names of concerned Upazila Officers, and (iv) official and cell phone numbers of concerned officers. The concerned Upazila level project facilitator will prepare a monthly report on these cases, and submit to the district coordinator.

As second tier of GRM, an Integrated Grievance Redress Mechanism (IGRM) will be established at the district level that will register user complaints using various mediums written, mobile or web based complaints and address them in a time bound system. The project will commit itself for proactive disclosure and sharing of information with the key stakeholders, including the communities/ beneficiaries. The project will have a communication strategy focusing on efficient and effective usage of print and electronic media, bill boards, posters, wall writing, and adoption of any other method suiting local context, logistics, human and financial resources. As part of IGRM, a Grievance Redress Cell (GRC) will be set up at project headquarters under each component.
Annex-1

An Outline for Consultation on the Installation of Buried Pipes
(If applicable for inclusion of buried pipe as an irrigation method)

Although land acquisition and involuntary resettlement will not be needed, hence RAP or ARAP not triggered, needed community consultation will be carried out for the sub projects under the Technology Adoption component if applicable to work out a, mutual compensation mechanism needed for temporary use of land such as for installation of buried pipes.

The contents of the consultation and the documentation of it will be following:

Introduction – Sub Project Background
i) Name of the sub project
ii) Purpose of the use of the land in the sub project
iii) Duration of the use
iv) A list of affected and benefited household head area affected and benefited for each household
v) Estimate of crop loss and other losses foreseen and any other cost involved
vi) Who to compensate and amount in Tk. for each contributors
vii) Who to receive compensation and the amount (Tk.) against each receiving household
viii) Timing of execution, collection of compensation
ix) Agreement between affected, benefited groups facilitated by the SAAO and agreed by the CIG/ PO
x) Describe the result of these efforts
xi) Submit findings while sub project included in the UP micro plan.

Items iv to vii will be organized in a comprehensive list to be prepared by the CIG/PO facilitated by the concerned extension agency officer.

Census and Socio-economic Surveys
xii) Identify all categories of impacts (loss of property and assets; loss of livelihood; impacts on groups and communities)

xiii) Give formats and tables for census surveys
xiv) Provide outlines for socio-economic survey

xv) Summarize process for consultations on the results of the census surveys
xvi) Describe need and mechanism to conduct updates, if necessary

Grievance Redress
xvii) Describe grievance redressal measures and fix responsibility

xviii) Describe the provisions to appeal to higher authority and arbitration/ salish
Procedure for Preparing a Tribal People’s Development Plan

In order to prepare a TPDP under the ARTS sub projects the following steps will be taken:
- Social screening to establish the presence of tribes in the project area or have collective attachment to the project area
- based on a detailed social assessments establish baseline data on the tribal people (subsistence, employment, community networks) in the project area;
- identify the impacts (both positive and negative) and prepare an IPDP;
- disclose the draft IPDP

The suggested format for the IPDP is as follows
- Description of sub projects and implications for the indigenous community
- Gender disaggregated data on number of tribal households by impact category
- Social, cultural and economic profile of affected households
- Land tenure information
- Documentation of consultations with the community to ascertain their views about the project design and mitigation measures. The consultation process will be culturally appropriate and acceptable to local people. Findings of need assessment of the community
- Community development plan based on the results of need assessment
- Modalities to ensure regular and meaningful consultation with the community
- Institutional arrangement and linkage with other national or state level programmes
- Institutional mechanism for monitoring and evaluation of IPDP implementation and grievance redress
- Implementation Schedule
- Cost estimate for implementation and budget provision

Key Elements of IPDP

The key elements in an IPDP include:
- All development plans for indigenous people should be based on full consideration of the options and approaches that best meet the interests of the communities.
- Scope and impact be assessed and appropriate mitigation measures are identified
- Project should take into account the social and cultural context of affected peoples, and their skills and knowledge relating to local resource management
- During project preparation, formation and strengthening of indigenous peoples organization; communication to facilitate their participation in project identification, planning, execution and evaluation should be promoted
- In case preparing and implementing IPDP in-house is not possible, experienced community organizations/ consultants can be involved as intermediaries.
Guidelines for Preparation of Micro Plans and Sub Project Proposal

Preparation of Union Micro-Plan will be initiated at CIG level and each CIG will prepare its own micro plan for one year. The extension agency officials at FIAC will facilitate the preparation of the micro plan at the CIG level and their prioritization at the UP level. The process will involve a number of activities to be preformed at sequential stages as elaborated below:

**Stage 1: Conducting Problem Census**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Participants</th>
<th>Resource person</th>
<th>Duration</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Identification of Needs/problems</td>
<td>Members of each CIG</td>
<td>Extension agency personnel and community level</td>
<td>1 day for each CIG</td>
<td>CIG village</td>
</tr>
<tr>
<td>• Prioritizing of Problems</td>
<td></td>
<td>extension agents (SAAO, CEAL, LEAF)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Stage 2: Interventions/Activities for Solving identified Problems**

<table>
<thead>
<tr>
<th>Problems prioritized</th>
<th>Interventions/Activities proposed by the CIG Farmers</th>
<th>Facilitation</th>
<th>Duration</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem 1:</td>
<td>1.</td>
<td>Extension agency personnel and community level</td>
<td>1 day</td>
<td>CIG village</td>
</tr>
<tr>
<td>Problem 2:</td>
<td>2.</td>
<td>extension agents (SAAO, CEAL, LEAF)</td>
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<tr>
<td>Problem 3:</td>
<td>3.</td>
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<tr>
<td>Problem 4:</td>
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</tbody>
</table>

**Stage 3: Consolidation of an Union Micro-Plan (activities shown are just examples)**

Based on the above problem identification and problem solving exercise by the CIGs with the facilitation of the extension agency personnel, each CIG will propose one or more sub project(s) to be implemented in a year or so. An indicative outline of the sub project proposal for the technology dissemination and SCD components is provided below:

1. Sub Sector:
(Separate sub projects for each sub sector: Crops, Livestock, Fisheries, SCD component)

2. Proposed by/ Name of CIG:
Village and UP name:
Upazila and district
2. Name of proposed intervention/ Sub project:

3. Duration of the proposed intervention: From ........ To .................

4. Needed support from the ARTS in Tk.

5. The statement of the problem desired to be addressed:

6. Location of the intervention:
   Village .................................. UP ..................................................

7. Major Activities
   a. Demonstration

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Number of demo</th>
<th>Area (dec) per demo</th>
<th>Number of animal/bird</th>
<th>Benchmark yield</th>
<th>Expected yield</th>
<th>Sponsor name</th>
<th>Sponsor farm category</th>
<th>Sponsor contribution (what)</th>
<th>Sponsor Cost (Tk)</th>
<th>ARTS contribution (what)</th>
<th>ARTS cost (Tk)</th>
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</table>

   b. Irrigation and farm mechanization support

<table>
<thead>
<tr>
<th>Type of equipment</th>
<th>Unit</th>
<th>Number</th>
<th>Cost per unit</th>
<th>ARTS support per unit</th>
<th>Benchmark area covered per unit</th>
<th>Expected area covered</th>
<th>Number of beneficiary farmers Total</th>
<th>Tenant and landless farmer</th>
<th>SM farmers</th>
<th>Large Med farmers</th>
<th>Fem HH head</th>
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<tbody>
<tr>
<td>LLP</td>
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<td>Buried pipe</td>
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<td>Flexible pipe</td>
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</tbody>
</table>


### c. Supplementary Irrigation

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Area (ha)</th>
<th>Benchmark yield MT per ha</th>
<th>Expected yield MT per ha</th>
<th>ARTS support per unit (LLP/STW)</th>
<th>Number of beneficiary farmers Total</th>
<th>Tenant and landless farmer</th>
<th>SM farmers</th>
<th>Large Med farmers</th>
<th>Fem HH head</th>
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<tbody>
<tr>
<td>Aus paddy</td>
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<tr>
<td>Aman paddy</td>
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<td>Wheat</td>
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<td>Maize</td>
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<td>Summer vegetables</td>
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<tr>
<td>Winter vegetables</td>
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</tbody>
</table>

### d. Support to produce and preserve seeds

<table>
<thead>
<tr>
<th>Crop Type/Animal/Fish</th>
<th>Number of farmers</th>
<th>Area under seed production support (ha)</th>
<th>Qty of seed (Unit to measure) kg, number of chicks, fry etc.</th>
<th>Quantity produced</th>
<th>Tenant and landless farmer</th>
<th>SM farmers</th>
<th>Large Med farmers</th>
<th>Fem HH head</th>
<th>Preservation method</th>
<th>Quantity preserved</th>
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### e. Procurement and distribution of quality seed and other inputs

<table>
<thead>
<tr>
<th>Type of input</th>
<th>Number of CIGs involved</th>
<th>Number of farmers to be benefited</th>
<th>Tenant and landless farmer</th>
<th>SM farmers</th>
<th>Large Med farmers</th>
<th>Fem HH head</th>
<th>Unit</th>
<th>Quantity procured</th>
<th>Quantity distributed</th>
<th>Price lower in %</th>
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86
### Marketing support provided

<table>
<thead>
<tr>
<th>Type of facility provided</th>
<th>Unit to measure</th>
<th>Number of facilities provided</th>
<th>Number of involved CIGs</th>
<th>Number of farmers benefited</th>
<th>Landless/SM/Tenant farmers</th>
<th>Fem HH head</th>
<th>Commodity marketed (Unit)</th>
<th>Quantity</th>
<th>Price without support</th>
<th>Price gain in %</th>
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### Training of farmers

<table>
<thead>
<tr>
<th>Type of Training</th>
<th>Number of Trainee</th>
<th>Duration of Training (days)</th>
<th>Person days of training</th>
<th>Female Trainee</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIG leaders</td>
<td>Other CIG farmers</td>
<td>Non-CIG farmers</td>
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### Exposure Visits of farmers

<table>
<thead>
<tr>
<th>Type of Activity</th>
<th>Number of Beneficiary</th>
<th>Duration of Visits (days)</th>
<th>Person days of exposure visits</th>
<th>Female Beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIG leaders</td>
<td>Other CIG farmers</td>
<td>Non-CIG farmers</td>
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</tbody>
</table>
### i. Other Support

<table>
<thead>
<tr>
<th>Type</th>
<th>Quantity</th>
<th>Number of Beneficiaries</th>
<th>Female Beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unit to measure</td>
<td>Cost (Tk)</td>
<td>CIG leaders</td>
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### j. Total Support

<table>
<thead>
<tr>
<th>Type</th>
<th>Contribution</th>
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<tbody>
<tr>
<td></td>
<td>Unit to measure</td>
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### 8. Overall likely benefits of the intervention:

- **a. Type of farmer and number of farm households**
  - Farms operated mainly by men
  - Farms operated by women farmers
  - Number of female headed households to be benefited
  - Number of landless sharecroppers/tenant farmers to be benefited (below 05 dec)
  - Number of marginal farm households to be benefited (05 to 249 dec)
  - Number of medium and large farmers to be benefited (250 dec and above)
  - Number of small pond operators to be benefited (not above one bigha or 33 dec)
  - Number of medium pond operators to be benefited (0.34 to 1.00 acre pond)
  - Number of large pond owners to be benefited (above 1.00 acre pond)
  - Number of backyard poultry/duck farmers to be benefited (below 20 adult birds)
Number of non-backyard poultry/duck farmers (20+ adult birds) benefited
Number of backyard goat and sheep farmers to be benefited (below 10 animals)
Number of non-backyard goat and sheep farmers to be benefited (10+ animals)
Number of backyard cattle fattening farmers benefited (up to 4 animals)
Number of non-backyard cattle fattening farmers to be benefited (5+ animals)
Number of backyard dairy farmers to be benefited (up to 4 cows)
Number of non-backyard dairy farmers to be benefited (5+ cows)

b. Description of expected benefits (benchmark and expected increased of area; number of birds, animals and expected increase of yield with benchmark).

9. Does the sub project proposed involve any installation of buried pipe? Yes/ No
   a. If yes has consultation been held to agree on the alignment, timing of installation to minimize loss of standing crops etc and mutual compensation and agreement reached between beneficiary and affected farmers? Yes/ No
   b. If yes, proceed and suggest inclusion of the sub project in the Union Micro Plan and if no, REJECT THE PROPOSAL OR modify the proposal to reach consensus before suggesting for inclusion in the Union Micro Plan.

10. Does the proposed sub project concern any tribal community households or affect their livelihoods? Yes/ No
    a. If No proceed and suggest for inclusion in the Union Micro Plan.
    b. If Yes, consult the involved tribal community people and follow-up on the TPDP

11. Any other social concern that can adversely affect marginalized groups (landless, women farmers, tribal community farmers etc). Yes/ No
    If yes what remedial measures are suggested

12. Is there any environmental concern such as negative effects on fisheries resources, decrease of soil fertility, pollution of water, air, soil etc. by increased use of agro chemicals including formalin and ripening materials? Yes/ No
    a. If yes what are these, what negative effects foreseen
    b. What remedial measures suggested and incorporated in the sub project

List Sub Projects by sub sector and prioritize them in the UP level by the representatives of the CIGs and POs in the UP level and thus prepare UP level micro plan on yearly basis.
## List of meetings and workshops attended and persons met in the village level

The Social Management Consultant attended the following workshops/meetings during 19\textsuperscript{th} to 22\textsuperscript{nd} December 2012.

<table>
<thead>
<tr>
<th>SL</th>
<th>Date</th>
<th>Venue</th>
<th>Organizer of the meeting/workshop</th>
<th>Types of main stakeholders attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18 Dec 2012 Morning</td>
<td>Department of Agriculture Conference Room, Khamarbari, Dhaka</td>
<td>NATP, DAE component</td>
<td>PD NATP, DG, DAE, NATP component heads and their representatives, Senior to mid-level officers of DAE, Members of World Bank Pre-appraisal Mission. Consultants, ESMF, WB.</td>
</tr>
<tr>
<td>2</td>
<td>18 Dec 2012 Noon</td>
<td>Department of Livestock Services Conference Room, Khamarbari Road, Dhaka</td>
<td>NATP, DLS component</td>
<td>PD NATP; DG, DLS; NATP component heads and their representatives, Officers of DLS Members of World Bank Pre-appraisal Mission. Consultants, ESMF, WB.</td>
</tr>
<tr>
<td>3</td>
<td>18 Dec 2012 Afternoon</td>
<td>BARC Conference Room, Farmgate, Dhaka</td>
<td>NATP, PCU and BARC</td>
<td>PD NATP, Executive Director BARC, NATP component heads and their representatives, Scientists of BARC and research institutes, Members of World Bank Pre-appraisal Mission. Consultants, ESMF, WB.</td>
</tr>
<tr>
<td>4</td>
<td>19 Dec 2012 Morning</td>
<td>Department of Fisheries Conference Room, Ramna, Dhaka</td>
<td>NATP, DoF component</td>
<td>PD NATP; DG, DoF; NATP component heads and their representatives, Senior to mid-level officers of DoF, Members of World Bank Pre-appraisal Mission. Consultants, ESMF, WB.</td>
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<tr>
<td>5</td>
<td>20 Dec Afternoon</td>
<td>Department of Agriculture Office of the Deputy Director, Madaripur district</td>
<td>Deputy Director, DAE, Madaripur</td>
<td>PD, NATP DAE component, PD, NATP DLS component, PD, NATP DoF component. District level officers of DAE, DLS, DoF of Madaripur and Shariatpur districts. Consultant, SMF, WB.</td>
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<td>6</td>
<td>21 Dec Morning</td>
<td>District Circuit House, Gopalganj</td>
<td>Deputy Director, DAE, Gopalganj</td>
<td>PD, NATP DAE component, PD, NATP DLS component, PD, NATP DoF component. District level officers of DAE, DLS, DoF of Gopalganj district. Consultant, SMF, WB.</td>
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<td>7</td>
<td>22 Dec Morning</td>
<td>Spices Research Station, BARI, Magura district</td>
<td>Deputy Director, DAE, Gopalganj</td>
<td>PD, NATP DAE component, PD, NATP DLS component, PD, NATP DoF component. District level officers of DAE, DLS, DoF of Magura district. Consultant, SMF, WB.</td>
</tr>
</tbody>
</table>
Sirajganj district

1. Md. Shafiul Alam, Deputy Director, Sirajganj 726 100 892
2. Mir. Nur Alam, District Training Officer, DAE, Sirajganj 755 507 728
3. Dr. Md. Delwar Hossain Majumder, Crop Production Specialist, DAE, Sirajganj 815 577 304
5. Mr. Horendranath Sarker, District Fisheries Officer, Sirajganj 711 192 435
6. Md. Shafiqul Islam, District Livestock Officer, Sirajganj 716 155 840

Belkuchi Upazila, Sirajganj

7. Mr. Mahbub Alan, Upazila Agriculture Officer, Belkuchi, Sirajganj 718 55 610
8. Dr. Arshaduzzaman Mondal, ULO, Belkuchi, Sirajganj 713 715 830
9. Mr. Prodip Kumar Sarker, UFO, Belkuchi, Sirajganj 722 158 775

Kamarkhond Upazila, Sirajganj

10. Md. Raj Uddin, UAO, Kamatkhond, Sirajganj 715 587 528
11. Dr. Md. Abdus Samad, ULO, Kamatkhond, Sirajganj 712 274 942
12. Md. Shafiqul Islam (In Charge), UFO, Kamarkhond, Sirajganj 718 935 431

Village Char Jhaul, Upazila Kamarkhond, Sirajganj

13. Jamal Sarker, CPM Club Farmer
14. Abdus Sahed, CPM Club Farmer
15. Ayub Ali, CPM Club Farmer
16. Selim Reza, CPM Club Farmer
17. Rahima Khatun, IPM Club Woman Farmer
18. Rabeya Khatun, IPM Club Woman Farmer
19. Sahinoor, IPM Club Woman Farmer
20. Rekha, IPM Club Woman Farmer
21. Saleha, IPM Club Woman Farmer

Village Bharenga East Para, UP Jhaul, Upazila Kamarkhond
22. Saddam Hossain, Farmer
23. Monsur Rahman
24. Shamim Hasan
25. Sirajul Islam
26. Abdus Subahan
27. Eshaq Ali
28. Hafizul Islam