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Project Title: From Tobacco to Food Production: Consolidation, Dissemination and Policy Advocacy (Bangladesh)

Centre File No. 105069-001
Duration of the Project: 1st April 2009 - 31st March 2011
Commencement Date: 1st April 2009

Formation of Research Teams

UBINIG (Policy Research for Development Alternative) conducted the research with Farida Akhter as the project leader. Farhad Mazhar, the Founding Director of UBINIG, provided technical assistance to the project. Dr. M. A. Sobhan consultant Nayakrishi Andolon agricultural research provided basic inputs for field experiments.

Two teams of researchers comprised of farmers of the area and UBINIG staff-- one stationed in Akhrabari Kushtia and the other at Paddaboti Biddaghor (Cox’s Bazar District), led the field works during the entire life time of the project and continued their work. Consultants with specialized skills have been incorporated into the research teams on a temporary basis, as needed.

Dr. Daniel Buckles was involved in the methodological training SAS methods and has visited Bangladesh during May, 2009 to design the research plans.

Most farmer-researchers who have been involved in the first phase of the research have continued depending on their capabilities and availability to devote time to the research, and ensuring the active participation of women farmers in the research.

An Agricultural Economist was hired as a consultant to carry out assessment of crops for the farmers shifting out of tobacco.

Since the new component of Health Research has been incorporated UBINIG Medical Research Team was involved. A Medical doctor was hired to carry out research on the impact of tobacco cultivation on health.

Shima Das Shimu supervised the activities and helped in the Dissemination and Policy advocacy works. UBINIG has many years of experience in working in health issues and has been known for raising issues to health. In the first year, the health impacts received much attention mostly from the women farmer-researchers.

The Nayakrishi farmers with expertise in seeds played very important role in the selection and procurement of seeds for alternative crops and in setting up seed huts in the tobacco growing areas.

UBINIG staff integrated into the project has been selected based on their skills, experiences profile and location in the study areas. Those involved in the first phase of research have been well trained with Social Analysis Systems2, and in other methodologies used for information collection. But in the meantime, other staff also were trained in SAS2 methods and could contribute they are able to facilitate village meetings and focus group discussions with farmers in the villages. They are also well versed in the different technical and social aspects of tobacco cultivation and the process of shifting.

However, for two (2) coordinators in three study areas, the actual time spent was
more than expected. In the budget the estimated time was 40%, but two coordinators had to devote full time for the project, which was counted 80% of their time. The project thereby paid those (2 coordinators) accordingly.

Rafiqul Haque Tito, the Coordinator of an UBINIG Centre in Cox’s Bazar, was responsible for coordinating the field level works in Cox’sbazar & Bandarban. For Kushtia in the first year Romela Akter Rumi and later on in the second year Mozahedul Islam Prince was responsible.

UBINIG staff time commitments.

**UBINIG Staff Time Commitments (Second Phase)**

<table>
<thead>
<tr>
<th>Researchers</th>
<th>Centre</th>
<th>Designation</th>
<th>Time Commitment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shima Das Shimu</td>
<td>Dhaka</td>
<td>Researcher</td>
<td>30%</td>
</tr>
<tr>
<td>Rafiqul Haque Tito</td>
<td>Cox’s Bazar</td>
<td>Coordinator</td>
<td>80%</td>
</tr>
<tr>
<td>Mahbubul Alam</td>
<td>Cox’sbazar</td>
<td>Researcher</td>
<td>100%</td>
</tr>
<tr>
<td>Rowshan Akhter</td>
<td>Cox’sbazar</td>
<td>Researcher</td>
<td>100%</td>
</tr>
<tr>
<td>Mozahedul Islam Prince</td>
<td>Kushtia</td>
<td>Researcher</td>
<td>80%</td>
</tr>
<tr>
<td>Rumela Akter Rumi</td>
<td>Kushtia</td>
<td>Coordinator</td>
<td>80%</td>
</tr>
<tr>
<td>Joynal Abedin Khan</td>
<td>Kushtia</td>
<td>Researcher</td>
<td>100%</td>
</tr>
<tr>
<td>Mahmuda Begum Nargis</td>
<td>Kushtia</td>
<td>Researcher</td>
<td>100%</td>
</tr>
<tr>
<td>Abdur Rauf</td>
<td>Kushtia</td>
<td>Researcher</td>
<td>100%</td>
</tr>
</tbody>
</table>

Synthesis

This is the final Technical Report for the two years April 2009 to March - 2011) of the Second Phase of the project "From Tobacco to Food Production: Consolidation, Dissemination and Policy Advocacy (Bangladesh)” commenced in April, 2009 conducted by UBINIG along with a farmers’ movement called the Nayakrishi Andolon, and supported by International Development Research Centre (IDRC), Canada to continue to support a shift out of tobacco production through research for consolidation of the experiences gained by farmers in shifting out of tobacco to food production and refine, replicate and disseminate to other parts of the country.

UBINIG (Policy Research for Development Alternative) has been conducting research on the impacts of tobacco cultivation on food crops production, environment and human health since 2006, a research project sponsored by International Development Research Centre, Canada. The first phase of the research was over in 2008. Through UBINIG’s work in the first phase farmers in three major areas such as Kushtia, Bandarban and Chakaria (Cox’sbazar) where tobacco was aggressively extending, farmers became aware of potential strategies to be adopted for shifting out of tobacco. But it was also the time when tobacco companies were taking aggressive promotion for tobacco cultivation. The second phase started in April 2009.

By 2005 – 2006, Kushtia experienced declining soil fertility and thereby low
productivity and low quality of tobacco. The companies, already been aware of such possibilities, started moving to other districts. This time the movement was to the southern part of Bangladesh, particularly to the Chittagong Hill Tracts (CHT). Based on the availability of fuel wood and availability of fertile land tobacco cultivation was started to move to Chittagong Hill Tracts, more specifically to Bandarban district. Initially in 1984 tobacco was grown only on 740 acres but it was increased on 4750 acres in 2005 - 2006, an increase of 540%. However, tobacco cultivation is still extended within Kushtia district and in the adjoining districts. The rate of increase is 41%.

According to government statistics (BBS), during 2007 - 08, tobacco was cultivated in 73,344 acres of land with three varieties Motihari, Jati and Virginia. Virginia is the most cultivated variety promoted by the tobacco companies. During the year 2008 - 2009 there was significant decline of tobacco production and other crops such as corn and potato on a commercial basis were done by farmers in Kushtia and Cox'sbazar as well as in other districts. Tobacco companies started offering higher prices for tobacco leaves and motivated farmers to grow tobacco in the food crop lands.

As a result, alarming extension of tobacco in the winter season, during 2009 -10 was seen and become a common concern. It has been an unpleasant scene to see tobacco production, a non-food and mono-crop invading over the land where there would be pulses, oilseed, onion, garlic, and varieties of vegetables. This sight was not also acceptable to environmental journalists who expressed their concerns in the newspapers. During 2009 - 2010UBINIG has collected information particularly on the impact of extension of tobacco and its impacts on food situation. As part of the action research, hundreds of tobacco farmers have shifted out of tobacco production and have been growing food crops under the leadership of the Nayakrishi farmers defying the illusive trap of the tobacco companies. Many farmers in different parts of the country cultivated tobacco instead of food crops because they were allured by the tobacco companies, with false promises of higher price for tobacco leaves. However, these farmers did not get anticipated returns in spite of the huge production of tobacco after harvesting. As the market price is determined solely by the tobacco company, the farmers had to surrender their aspirations of remunerative price of tobacco leaves to the monopolistic market of the tobacco companies. The farmers were frustrated because the tobacco companies had committed higher price at the time of sowing but were paid much lower rate at the time of procurement of tobacco leaves.

During the tremendous increase in Tobacco farming during the 2009 - 2010 with the promises of higher prices by the tobacco companies, and the outrage after being deceived with prices, the farmers under research program shifting out of tobacco became a source of inspiration and a hope that there is an alternative to tobacco farming. This itself became dissemination as more and more farmers have approached UBINIG for joining to be out of tobacco.

The research efforts by the farmers encouraged farmers in the village to take initiative to grow food crops. Although as part of field experiment UBINIG supported many farmers in the three research areas, there were others who took initiative on their own and in Chakaria, the government administration helped farmers to grow food rather than tobacco. During 2010-2011, there were much less tobacco cultivation in the research areas the information was disseminated and alternatives could be demonstrated.

The sharing of the information was done quite extensively and various meetings
were organized at the local level, district level and at the high policy making bodies to support tobacco farmers to shift out to food crops. The issue of the impact on food was demonstrated and therefore several policy decisions were declared by the government including no subsidy for fertilizer to tobacco farmers, no bank loan support etc. However, the Department of Agriculture was still not very proactive to give seeds and other input support to farmers. It is still a major question for the farmers in tobacco growing areas whether surplus food production could be sold beyond the local market. Getting the seeds for food crops in right time also remains a big question.

The assessment of profit and loss of tobacco and food crops was done by Agricultural Economist and it was again proved that combination of food crops cultivated under Nayakrishi farming practice without use of chemical fertilizer and pesticides is much profitable as well as sustainable.

The second phase of the research emphasized on health impacts of tobacco cultivation. The occupational health hazards could be documented for the tobacco workers and family members and it showed significant different between tobacco and non-tobacco farmers in terms of illnesses such as gastric diseases, back pain, leg pain and joint pain. The exposure to pesticides was documented and the trade names of the pesticide used in tobacco were collected. However, more research is needed in these aspects to establish the links with the health impact and tobacco cultivation.

Due to the dissemination of information on health and food crisis, women’s organizations at the district levels are now interested and joined in the Anti-tobacco movement. UBINIG has been invited in various meeting of Anti-Tobacco Alliances to speak about harmful effects of tobacco cultivation and the health impacts in particular; and thirdly, to carry out advocacy, campaign and dissemination works at the local levels to the national level.

The SAS methods used for crop selection and particularly for health impacts were very useful involving the farmers to provide the information and analyzing the findings.
1. THE RESEARCH PROBLEM AND JUSTIFICATION

In the context of extensive tobacco cultivation and the farmers’ willingness to shift to food crops, research in the Phase I of the IDRC supported project “From Tobacco to Food Production: Assessing Constraints and Transition Strategies in Bangladesh” helped develop a detailed understanding of the constraints tobacco farmers face and demonstrated a number of viable alternatives to tobacco production. These were done from the perspective of Nayakrishi Andolon, a biodiversity-based farming system of Bangladesh, initiated by UBINIG with over 300,000 farming families in different districts including those in tobacco growing areas of Kushtia, Cox’sbazar and Bandarban. The most important findings of the Phase I were key principles such as the distinction between transition crops and substitute crops, as a strategy to be taken for those who want to shift out of tobacco. The selection of crop combinations for Transition as well as for Substitution was quite innovative and appropriate for replacing tobacco. The success of the selection of the crops was assessed on the basis of economic grounds as well as much longer term benefits such as soil quality, human health, control over seeds and also marketing of products. The Second Phase of the project found more interested farmers to join in the research for transition as well as for substitution to tobacco.

At the farmers’ level, the technical and economic feasibility of promising crop combinations has been confirmed. However, for farmers to take up on wider scale and to convince the policy makers at the national level two major questions remain to be addressed. One is the challenge of availability of seeds of food and other crops. This is because of cultivation of tobacco for long time in an area, the farmers have lost their own stock of indigenous seeds. Secondly, after over three decades of tobacco cultivation in the research sites such as Kushtia, the soil nutrient status has been badly degraded due to long duration of tobacco production which required application of huge quantities of chemical fertilizers and pesticides for long time.

The worst damage has been done on the soil in Kushtia. The soil is impregnated with weeds of ‘orobanche’ a parasitic higher plant, locally known as ‘Mula’. The weeds germinate on the roots of tobacco plants, grow fast and exhaust the tobacco plants. Consequently, the yield of the tobacco plants is also drastically reduced. This is also a reason for tobacco companies to move to other more fertile areas.

The physical structure and chemical properties of soil has been changed with continuous monoculture of tobacco production. The organic matter content of soil has drastically been reduced. So is the water holding capacity of the soil. Organic matter is, in fact, the storehouse of soil nutrients including nitrogen, phosphorus, sulfur, etc. It increases exchange capacity and offers energy for soil microbial activity.

All other crops like rice, wheat, jute and so on leave behind some organic residue in terms of roots, leaves, straw etc. which on decomposition initiate the growth of soil micro-organisms. On the contrary, tobacco as a crop takes maximum amount of nutrient for luxuriant growth of plants. The leaves, stem and roots are harvested for processing and marketing. But nothing remains as organic residue in the field.

The farmers have experienced some of unusual characters of the soil. These are:

1. The soil has become hard
2. Soil dries up quickly
3. In some places the water does not drain out easily
4. The natural smell of soil has been impaired
5. The soil colour has changed.

The farmers have identified the above soil problems and have been worried. In order to improve the soil nutrient status, the farmers have identified some crops and cropping patterns. Leguminous crops including mung bean, lentil, grass pea, pigeon pea, chickpea, black gram, groundnut, etc. have been selected for incorporation in the cropping pattern.

The improvement of organic matter content of soil is not enough for taking decision to shift out of tobacco. It is also important to use a crop management system that offers sustainable and profitable production along with their capacity to offer residue as organic matter for soil. Right management of soil will help ensure high yields. Thus, it appears that the soil so managed to make high yield in turn is also improved at the same time. It is, however, a continuous and long-term process to improve the soil.

With the present research, the farmers could change the crop pattern with the purpose of improving soil was only during 2 to 3 years. However, a complete reversion of soil nutrient status may require 7 to 8 years of systematic effort. Moreover, tobacco has been grown in different types of soils. Therefore, experiments in different types of soil are required to work out the appropriate strategies for improving the productivity of soil so far degraded. The research farmers, who have shifted from tobacco to food and other crops production, have shown the potential for improvement. They will need to continue their activities for at least 4 to 5 years more for confirmation of findings in wider dimensions.

Thirdly, the occupational health hazards of growing tobacco were not documented properly in the first phase of the research. So while tobacco has negative impacts on food security, soil water, etc., its direct impact on health could not be documented. It was important to frame the transition as an occupational health issue as the relevant Ministry for the Law for tobacco control is the Ministry of Health and Family Welfare under the obligation of the World Health Organization’s Framework Convention on Tobacco Control (FCTC). The SMOKING AND TOBACCO PRODUCTS USAGE (CONTROL) ACT, 2005 has only one article (Article 12) to deal with alternative to tobacco cultivation, but nothing to deal with occupational health of tobacco farmers and workers.

The health impacts of tobacco farming were becoming visible specially the farmers and their families continuously experience the occupational health impacts of growing tobacco. These have been noticed in the first phase of the study (2006 – 2008). In the second phase (2009-2011) documentation of these impacts is needed to support resolve in the face of the tobacco lobby in favor of tobacco on economic grounds only. Framing the transition as an occupational health issue would greatly enhance public support for government action.

Efforts to disseminate and replicate the experiences for advocating to the government promoting widespread adoption needed understanding of the complexity of the inter-ministerial linkages and the influence of the tobacco companies on the government by paying high amount of VAT to the National Board of Revenue (NBR). It remained a problem to establish the fact that tobacco cultivation actually takes away the land from food production. At the same time, for the farmers who are in tobacco
cultivation for long period of time, needed to find ways to have access to seeds of food crops and support for marketing and strategies to improve degraded soils with the selected crops. Tobacco became a part of cash crops and any effort to stop tobacco cultivation needed to ‘prove’ a viable alternative. However, any other crop need not be a monocrop but a cropping system with diversity is needed which will ensure multiple uses and markets for outputs, and a steady flow of income.

Broader dissemination of results and advocacy for specific policy and programme initiatives require documentation and analysis of agricultural system and health impacts of tobacco cultivation. Dissemination strategies are needed at two levels. First, appropriate messages and guidelines are needed to help farmers through the complex process of deciding what crops to grow, how to grow them and what benefits and costs they can expect. As farmers in different regions have different kinds of resources, constraints and cultural perspectives (labor, land, capital, knowledge, land tenure systems, etc.), dissemination strategies also need to be adjusted to address their collective concerns and answer individual questions.

A communication strategy and related educational materials are needed to engage the general public, scientists and government officials in a serious discussion about the public policy implications of shifting out of tobacco production. To be effective, educational materials and other research results need to take different forms for different audiences.
Specific Objective 1: Refine, replicate and assess alternative cropping systems

1. a.i. Agricultural research planning

Direct experiment at the field level is the most important segment of the research. The main focus was to find out the proper agricultural crop combinations for replacement of tobacco. This replacement of tobacco by food crops involved a lot of practical issues including those of agricultural and land policies to be addressed. In the First phase of the research (2006-2008) various practical issues emerged. These included the following:

1. Land selection
2. Cropping plan
3. Seed management
4. Land preparation
5. Marketing of products

It was found from the experience of farmers in the research that the need is not only to select crops to replace tobacco for certain months when tobacco is grown, but to devise a cropping pattern round the year matching the environmental conditions in the respective areas of research. The replication would then be possible at the national level in different geographical areas. Generally tobacco is planted in Late September to early October and harvested during mid March to end April. At this stage, the farmers must go for planning of the next season and crops. Those farmers who continue tobacco production they can plan for growing only Aus paddy. No other crops can be grown after that. Aus paddy occupies the land during mid June – mid September. Other tobacco farmers keep the land fallow. That means they have only one crop in a year, i.e. tobacco.

Tobacco is grown during the Bengali months of Kartik to Baishakh (mid October – mid April). The tobacco farmers usually follow two cropping patterns

- Tobacco – Aus paddy – Tobacco: Only two crops one food and one non-food
- Tobacco –fallow – Tobacco: One non-food crop

In the later pattern the land, in fact, remain fallow for about four months and tobacco becomes monocrop cultivation for the whole year.

On the other hand, farmers who have decided to shift out of tobacco they plan to grow other crops in Baishakh – Ashar (mid April – mid June). Those farmers, who have expressed interest to give up tobacco and go for food crops, need support particularly in the selection of crops and provision of necessary inputs, particularly the seeds.

The cropping pattern is designed keeping the major crop seasons of summer, monsoon and winter in view. These are given according to Bengali months as farmers only follow the Bengali months. These are:

1. Summer season: Baishak – Jaista (mid April – mid May)
2. Monsoon & post monsoon: Ashar - Kartik: (mid May – mid October)
3. Winter (Kartik – Baishakh: mid October – mid April)

Those farmers who have expressed interest for abandoning tobacco in favor of growing food crops, cropping designs were made at two levels:

1. Crops for transition period which included crops for summer and monsoon season. The crops selected for this period are termed as ‘Transition crops’. The main transition crops for Cox’s Bazar include: leafy amaranths, leaves of radish, coriander, okra, bitter gourd, yard long bean etc. The main transition crops for Kushtia region included: leaf amaranth leafy radish, spinach, cabbage and coriander.

2. The crops grown for replacing tobacco in the winter season or the rabi season. These are food crops which were grown before tobacco was introduced in the area. These are main food crops, for research purpose called the ‘Substitute crops’. The substitute crops for Cox’s Bazar included potato, French bean, Felon, sweet gourd, chili, Egg plant, Ground nut and tomato. The main substitute crops for Kushtia included potato, wheat, maize, garlic, masur (lentil), mustard and chili.

Shifting out of tobacco is not complete without a complete cycle of transition and substitute crops.

1. a. ii. Training workshop

During the two years, 8 planning and training workshops were held in the working districts. The objectives of the workshop were:

1. To identify the working areas specifically
2. To make the work plan for the research
3. To select areas for implementation of research activities, extension of research areas and publicity.
4. Distribution of activities among the UBINIG research workers and farmer researchers, assigning the role played for the farmers in the village and other stakeholders
5. Conduct SAS exercise
6. Select the appropriate SAS technique matching the objectives of research.
7. Training on Nayakrishi farming system for the transition and substitute crops.

Accordingly the training and planning workshops were held in different areas as shown in the table below:

Table 1: Training workshops for planning and implementation of activities

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>DISTRICT</th>
<th>LOCATION</th>
<th>PERIOD</th>
<th>NUMBER OF PARTICIPANTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pabna</td>
<td>Ishwardi</td>
<td>5-7 May, 2009</td>
<td>38</td>
</tr>
<tr>
<td>2</td>
<td>Kushtia</td>
<td>Kumarkhali</td>
<td>18-20 June, 2009</td>
<td>27</td>
</tr>
<tr>
<td>3</td>
<td>Dhaka</td>
<td>Shyamoli</td>
<td>13-15 June, 2009</td>
<td>31</td>
</tr>
<tr>
<td>4</td>
<td>Cox’ Bazar</td>
<td>Chakaria</td>
<td>24-26 August, 2009</td>
<td>26</td>
</tr>
<tr>
<td>5</td>
<td>Dhaka</td>
<td>Shyamoli</td>
<td>12-14 June, 2010</td>
<td>24</td>
</tr>
</tbody>
</table>
The training was attended by representatives of the following institutions / professions:

1. The tobacco farmers interested to grow food crops shifting out of tobacco
2. Farmers who have shifted in the Phase 1 research
3. Leading Nayakrishi farmers
4. Farmer researchers
5. UBINIG Research Workers
6. Consultants engaged in research
7. Center coordinators in Chakaria and Kushtia
8. UBINIG management team
9. Public representatives
10. Upazila Assistant Agriculture officer (Block Supervisors)
11. Teachers
12. Land owners
13. Village Doctor
14. Representatives of Civil Society
15. Journalists

**Issues discussed in the Training workshops included the following:**

Extensive discussion were held on the results of the research of the first year of the second phase, production of food crops shifting out of tobacco and about the gaps to be filled during the project period. The major items of discussion in the workshop included the following:

1. Distribution of responsibilities for activities in different areas.
2. Distribution of work load among UBINIG workers, farmer researchers and others in the field and in the center.
3. Responsibilities of Nayakrishi farmers and Gram Kormies in the field and in the center.
4. Responsibilities of the Nayakrishi farmers and the Gram Kormies.
5. District wise planning and implementation of activities.
6. SAS training and exercise, 8 tools including wheel, Household profile, Force Field, Competing Goals, Time line, Ecological Domain, Stakeholder identification (Rainbow), Impact & incidences (Rainbow).
7. Observation of activities in the field, direct discussion with the farmers and others.

8. Field visit of cultivated land and crop observation

Output of Training Workshop:

A total of eight workshops were held in two years. These workshops were much helpful for implementation of the activities. The field based activities were implemented in time according to the recommendations of the workshops.

Alliance was formed with different NGOs, and local administration for stopping tobacco production. Vigorous lobbying activities were carried out for resisting the extension of tobacco production. Effective public awareness against tobacco production was created.

The foothold of the farmers was very strong who had shifted from tobacco to food crops. Despite so many hurdles, the farmers once shifted, have been growing food crops. The Leading Nayakrishi farmers and the Experiment Farmers contributed significantly in the shifting from tobacco to food crops production.

1. b. i. Baseline Survey

The focus of the second phase of research was dissemination and replication. Accordingly baseline information was collected from those areas where there was greater scope for sharing the experiences of farmers, who have shifted out of tobacco. The other priority consideration for selection of location of Base Line survey included:

1. Long time record of tobacco production.
2. Scope for motivation in favour of food crop production
3. Accessibility and transportation facilities
4. Potential wider scope for publicity for working against tobacco

The information was collected in two ways:

- Primary information was collected on the whole union, each composed of at least 10 villages. Tobacco production is not confined in one village only; rather it is spread across the whole area of the union.
- Within a union, villages were selected on the basis of maximum concentration of tobacco cultivation.

Village selection and survey activities were supposed to be limited in the first year of second phase. However, based on the interest of the farmers and significant success of research, some new villages were included for implementation in the second year.

The selection of area was important for implementing the activities for controlling or stopping the cultivation of tobacco. The farmers can shift quite easily from tobacco to food crop production, but to ensure sustainable shifting requires the economic condition of the farmers, land condition and other social issues to be congenial and favourable. In the case of replication in newer villages, the role of the farmers in the neighboring village is also important, especially those farmers who have shifted earlier. In the second year, seven villages in the three regions were included for implementation of the replication activities.

The criteria for selection of the new villages were the following:
1. villages are adjacent to the old villages of phase 1.
2. villages have track record of cultivation of tobacco for long time.
3. farmers are interested for growing food crops.
4. transport and communication of the villages are good.
5. Easy approach for advocacy
6. common residents are in favour of shifting from tobacco to food crops production.

The proximity of the newer villages to the old ones and regular contact with the shifted farmers from phase 1 played a very important role. Following the examples of those farmers the farmers in the new villages were encouraged to shift out of tobacco and grow food crops.

**Method of information collection**

The potential land was selected based on the experience of the previous activities of survey and mapping. Group discussions were held for collection of relevant information. Basic information of the union was collected at a glance.

Information on potential crops of the selected village was collected. The farmers drew the picture of the entire village with crops along the land and soil type. (More pictures of the villages in the Appendix 1)

**Basic information:**

The basic information included data on the region, location, geographical boundary, number of households, cultivable land, fallow land, high land, lowland, plain land, land under tobacco production, land under crop production, method of cultivation, irrigation system, type of soil, number of farming household, number of tobacco farmers, plantation type, livestock, poultry, drainage, source of water marketing system, educational institution religious institutions, communication system, history of tobacco production, number of kilns in the village, name of the tobacco company, etc.

**Method of information collection**

1. Structured questionnaire was used for collection of information in the village.
2. Collection of information from members of different professions in the village
3. Union council office
4. Focus Group Discussion (FGD)

The collected information was cross checked with Upazila Agriculture Office, District Information Office and the Bangladesh Bureau of statistics.

The assumption of the baseline survey areas for potential farmers to shift out of tobacco included:

- Longtime record of tobacco production. The farmers are reportedly fed-up with hazards of tobacco.
- Nayakrishi activities are in place. Nayakrishi farmers can play an effective role for providing support to farmers shifting out of tobacco production.

In the new areas, where tobacco production has been recently introduced, the farmers may be motivated to resist further extension of tobacco.

The main information included:


Table 2: The areas covered by Baseline survey for 2nd phase (2009-2011) are presented in the following

<table>
<thead>
<tr>
<th>AREA 1</th>
<th>District</th>
<th>Upazilla</th>
<th>Union</th>
<th>Village</th>
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<tbody>
<tr>
<td></td>
<td>Cox'sbazar</td>
<td>Chakaria</td>
<td>Boroitoli</td>
<td>Maizpara</td>
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<td>Boroitoli</td>
<td>Khoiratipara</td>
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<td>Bomubilchori</td>
<td>Panissharbil</td>
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<td>Bomubilchori</td>
<td>Maizpara</td>
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<td></td>
<td></td>
<td>Bomubilchori</td>
<td>Bamur Kul</td>
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<td></td>
<td></td>
<td>Kakara</td>
<td>Uttar lotoni</td>
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<td></td>
<td></td>
<td></td>
<td>Surajpur Manikpur</td>
<td>Uttar Surajpur</td>
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<td></td>
<td>Lakhyarchar</td>
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</tr>
<tr>
<td>Area 2</td>
<td>Bandarban</td>
<td>Lama</td>
<td>Gazalia</td>
<td>Sapmapara Jhiri</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Lama Sadar</td>
<td>Lama Mukh</td>
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<tr>
<td></td>
<td></td>
<td>Ali Kadam</td>
<td>Choikhong</td>
<td>Nayapara</td>
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<td>Marmapara</td>
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<td></td>
<td></td>
<td>Choikhong</td>
<td>Isaqkarbari para</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Choikhong</td>
<td>Moktar Sardarpara</td>
</tr>
<tr>
<td>Area 3</td>
<td>Kushtia</td>
<td>Mirpur</td>
<td>Sadarpur</td>
<td>Borobaria</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fulbaria</td>
<td>Tilkandra</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Daulatpur</td>
<td>Amla</td>
<td>Anjongachi</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kholishakundi</td>
<td>Nazibpur</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Kholishakundi</td>
<td>Pratabpur</td>
</tr>
<tr>
<td>Area 4</td>
<td>Jhenaidoh</td>
<td>Shoilkupa</td>
<td>Dudhshor</td>
<td>Folia</td>
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Table 3: Surveyed village outside direct tobacco research area

<table>
<thead>
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<th>UNION</th>
<th>Upazilla</th>
<th>District</th>
</tr>
</thead>
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<td>Delduar</td>
<td>Tangail</td>
</tr>
<tr>
<td>Lauhati</td>
<td>Delduar</td>
<td>Tangail</td>
</tr>
<tr>
<td>Silimpur</td>
<td>Delduar</td>
<td>Tangail</td>
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<td>Shalla</td>
<td>Kalihati</td>
<td>Tangail</td>
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<td>Kachikata</td>
<td>Gurudaspur</td>
<td>Notore</td>
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</table>

Table 4: The final selection of the areas for the second phase research was the following

<table>
<thead>
<tr>
<th>AREA</th>
<th>District</th>
<th>Upazilla</th>
<th>Union</th>
<th>Village</th>
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<td>Cox’sbazar</td>
<td>Chakaria</td>
<td>Boroitoli</td>
<td>Maizpara</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>Boroitoli</td>
<td>Khoiratipara</td>
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<td>Bomubilchori</td>
<td>Panissharbil</td>
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<td>Bomubilchori</td>
<td>Maizpara</td>
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<td>Kakara</td>
<td>Uttar lotoni</td>
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<td></td>
<td></td>
<td></td>
<td>Surajpur Manikpur</td>
<td>Uttar Surajpur</td>
</tr>
<tr>
<td>Area 2</td>
<td>Bandarban</td>
<td>Lama</td>
<td>Gazalia</td>
<td>Sapmapara Jhiri</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ali Kadam</td>
<td>Choikhong</td>
<td>Nayapara</td>
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<td></td>
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<td>Choikhong</td>
<td>Marmapara</td>
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<td></td>
<td>Choikhong</td>
<td>Isaqkarbari para</td>
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<td></td>
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<td></td>
<td>Choikhong</td>
<td>Moktar Sardarpara</td>
</tr>
<tr>
<td>Area 3</td>
<td>Kushtia</td>
<td>Mirpur</td>
<td>Sadarpur</td>
<td>Borebaria</td>
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<td>Fulbaria</td>
<td>Tilkandra</td>
</tr>
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<td>Kholishakundi</td>
<td>Nazibpur</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kholishakundi</td>
<td>Pratabpur</td>
</tr>
</tbody>
</table>

Rationale for selecting areas for research in second phase:

The new villages were selected in the two years of second phase (2009 – 2011) were the following:

1. Nayapara, Alikodom, Bandarban

The reports from farmers and newspapers have indicated that during 2009 - 2010, maximum extension of tobacco has taken place at Alikodom upazila. The tobacco companies have been very active in this critically important location. This area is thinly populated. The rich soil, biological diversity and easy availability of fire wood for curing tobacco leaves has attracted the tobacco companies for selecting the area for tobacco production. UBINIG therefore, has selected the Choikhong union of Alikodom upazila for motivating farmers to shift out of tobacco production and to investigate how the farmers respond to the option of growing food crops.

2. Pannisharbeel, Chakoria, Cox’s Bazar

Bomubilchori union is 25 km east of Chakoria sadar. Matamuhuri river is around four sides of Bomubilchori. This area is annually flooded. As a result Aus rice and Aman rice grow well in this land. Due to tobacco cultivation the acreage and production of Aman rice has been declining. Tobacco cultivation has been expanding on the fertile land on the bank of the Matamuhuri river. This is quite suitable for production of ground nut, chili pepper, egg plant and other winter
crops.

Bomubichori has been selected for research. This selection was also based on i. proximity to Lama and Manikpur union of Chakoria, the two successful research areas of phase 1 and ii. general consensus among farmers was there to get out of tobacco cultivation.

3. Maizpara, Chakaria, Cox’s Bazar

Boroitoli stands in the mid point between Cox’s Bazar and Chittagong districts. Lama upazila is on the east. This area is washed by flash flood coming down the hills. The unique attribute of this union is that the soil is very fertile, and is very well connected and communicated with other areas. From publicity point of view it is very suitable for dissemination. Besides, there are other commercial and cash crops such as floriculture and commercial vegetable production with extensive use of chemical fertilizer and pesticides. So it is a challenge for farmers to shift out of tobacco cultivation to food production without use of any chemicals and with local seeds.

4. Borobaria, Mirpur, Kushtia

Borobaria village is near Chatian union of Mirpur upazila, where the first phase of the research was carried out and farmers were interested in joining Nayakrishi to shift out of tobacco. Nayakrishi activities have been carried out in this union for long time. With a view to making best use of these accomplishments on record Borobaria village was selected for further research. The communication system of the village is also very good.

5. Nazibpur, Daulatpur, Kushtia

Research in the first phase was initiated in the Refayetpur union of Daulatpur upazila. The farmers in this region have played significant role in shifting out of tobacco production. In continuation of that work, the neighboring union Khalishakundi was selected for second phase research. This was also selected to create public awareness against tobacco production which has been causing serious problems.

6. Khoizatipara, Chakaria, Cox’s bazar

This village is located in the Chittagong - Cox’s bazar highway. It is also near the cross road connecting Pekua and Kutubdia. This village has a history of tobacco cultivation for last 8 years. The soil is very fertile. It is washed by flash flood every year but there is no problem of water logging. The soil is suitable for vegetable production. The area is also used for commercial production of flowers. Maizkakara is a neighboring village where some farmers last year shifted from tobacco to food crop production. Being encouraged with that example many farmers in this village were interested for shifting. It is located at the junction of three roads and is very well connected with other areas. The geographical location of this village appears to be helpful for demonstration of shifting from tobacco to food crops.

7. Uttar Lotni, Chakaria, Cox’s bazar

This village is located near the char land on the bank of the river Matamuhuri.
Many rabi crops including watermelon, groundnut, melon and vegetables grow luxuriantly here. There is some khas land in the char area. This year the local administration announced that there will be no tobacco cultivation in khas land. The farmers in the near by village had in the mean time shifted to food crop production. With the inherent potential in view this village was selected for transition to food crop production of tobacco.

8. Uttar Surajpur, Chakaria Cox’sbazar

This village is on the east of Chakaria. It is in Surajpur Manikpur Union. Tobacco is grown in large area in this village. The farmers in Madhya Surajpur have been involved in action research for shifting out of tobacco in favour of growing food crops. The farmers in this village were exposed to the change in the neighboring village. They expressed their feeling for shifting out of tobacco. Accordingly this village was selected for transition from tobacco to food crops. This union is located in the center of Chakaria Upazila, where tobacco is grown in large areas. So there is constant presence company on the farmers.

9. Maizpara, Bomubilchori, Chakaria, Cox’sbazar

Maizpara village is under Bomubilchori union. Bomubilchari is on the east corner of Chakaria upazila. At the same time, it is surrounded by Lama upazila of Bandarban district. The Matamuhuri river passes over the Bomubilchari union. Tobacco has been grown on both banks of the river Matamuhuri. In first year of the second phase of research, farmers in a neighboring village have shifted out of tobacco. Being encouraged with the results of that village, this village was also selected for research for shifting out of tobacco. It is easily approachable through publicity and advocacy.

10. Moktar Sardar para, Isahoque Karbari para and Marmapara Alikodom, Bandarban

The Matamuhuri river passes over this union. The research for transition from tobacco to food crops was conducted in one village of this union in the first year of the second phase. The results of the first year in that village were encouraging for shifting out of tobacco. Based on the interest of the farmers in this village, it was selected for the action research.

11. Tilkandra, Mirpur, Kushtia

The research for growing food crops shifting out of tobacco has been conducted in two adjoining villages namely Kochuadoh and Chatian during 2006-2008. Many farmers in those two villages have given up tobacco production and are now growing food crops. The communication system of this village is also very good. There is a trend among the farmers in the neighbouring villages to get out of tobacco. Based on the interest of the farmers this village was selected for shifting out of tobacco.

12. Protappur, Daulatpur, Kushtia

This village is in Khalisha kundi union. There is a trend of shifting out of tobacco among the farmers. So this village was selected for action research for growing food crops shifting out of tobacco.
1.b.ii SAS Tools

The SAS tools were used for several purposes. These were

1. FORCE FIELD: to know why the farmers were in Tobacco cultivation
2. Social Domain: to know type of farmers continuing tobacco production
3. Time Line: Events in the agricultural history and development in the region
4. Stakeholder Identification: to identify the key actors involved in existing markets and to assess how they will be affected by the shift
5. Option Domain: To identify crop characteristics
6. Wheel: Post-harvest evaluation to assess performance of crops

Why the farmers are in Tobacco Cultivation? Exercise of FORCE Field

A Force Field SAS Exercise was done in Nayapara in AliKadam upazilla of Bandarban. About 14 tobacco farmers participated in the age range of 27 years to 72 years. They identified the reasons for tobacco cultivation as the following:

1. Get loan and inputs from the tobacco company, including seeds, polythene, fertilizer etc. The company supports them from the stage of seedbed to curing of the leaves.
2. Can sell the leaves (the final product) at a time. The company buys all the leaves and the farmers can receive a lump sum amount of money.
3. Tobacco farmers can get loan money from different sources such as moneylenders, and different loan giving organizations because they are considered as creditworthy.
4. Cyclical loans of the tobacco farmers. No tobacco farmer is without loans. They run the family expenses with loan money.
5. Tobacco farmers are constantly motivated and given incentives by the Tobacco companies. Companies provide treatment facilities to few farmers, give training to “good tobacco farmers”, and declare increase of price of tobacco leaves before cultivation.

The counter forces against the promotion of the companies and the vulnerabilities of the farmers were identified as the following:

1. The farmers are gradually becoming aware about the increased indebtedness and cyclical bondage with loans through the relationship with the companies
2. There is a law against use of tobacco products
3. There is campaign against tobacco farming
4. The Army in the Chittagong Hill Tracts (CHT) has created pressure against use of trees as firewood for tobacco curing.
5. Discouragement by Agriculture and Forest Department in CHT to cultivate tobacco.
6. Presence of Nayakrishi Farmers in the area who provide options for alternative crops.

Among the reasons for tobacco cultivation the highest score (5 out of 5) were for the benefits received from the company and marketability of the tobacco leaves to get
the cash money at a time. On the other hand, the highest scores for the counter forces were awareness (3), campaign against tobacco cultivation (3) and the discouragement by the Agriculture and Forest Department (3). But it shows the company incentives are still higher than the counter forces, therefore the tobacco cultivation is continued.

Why the farmers are continuing tobacco cultivation?

Social Domain: Profile of farmers continuing tobacco production

This exercise was carried out in three villages in three research sites of Kushtia, Bandarban and Cox’sbazar (Chakaria). In the exercise the profile was developed by looking at the similarities and dissimilarities among the farmers in the context of their particular reasons for continuing to grow tobacco.

Out of the three villages the common causes that drove the farmers to continue tobacco farming was the following:

1. Existence of tobacco cultivation in the village
2. No options for other crops
3. Company benefits
4. Easy marketing
5. Uncertainty of selling vegetables
6. High land lease value
7. No support from Agricultural Extension
8. Incentive from tobacco companies, but no incentive for other crops

Choikong: Alikadam Bandarban

In Choikong village negative experiences of vegetable production by not being able to sell, no advice from the agricultural department, no incentive for vegetable production and being trapped into the debt payment became major causes, while the tobacco companies offered all kinds of support and incentives. The high lease value of land also forces the farmers into tobacco cultivation.

Bomobilchari: Chakaria, Cox’sbazar

In the Bomobilchari the specific causes were the experience of falling price after vegetable cultivation, no loan for agricultural production, technical support from Tobacco companies. The farmers feel that with tobacco production they get higher social status and the apparent economic benefits.
Tilkandra, Kushtia

Tilkandra village of Mirpur, Kushtia farmers mentioned that Company card holders have economic benefits, company provides all inputs, have become used to tobacco cultivation, the perception of cash income to raise social status. On the other hand there is no support for food production.

The profile of the farmers in the three areas clearly show that there are pro-active benefits offered by the tobacco companies to engage farmers in tobacco, on the other hand, the absence of support from the agricultural department, particularly food crops, particularly vegetables, acts as a disincentive to grow food crops. This shows the helplessness of the farmers and their vulnerabilities which leads to the cultivation of a destructive crop. As a result once farmers start tobacco production, they continue to grow it despite their losses and visible harmful effects on environment and human health. It becomes a point of ‘no return’.

1. c.i. Market Assessment for promising crops

   i. Assess market for promising crops

   Marketing of the agricultural produce is the most important part of the success of transition from tobacco to food crops production. The farmers consider the prospect of marketing the crops cultivated after shifting out of tobacco as a top priority. Tobacco cultivation has created an image that its market is guaranteed, while the food crop market is not. So the strategy for shifting out of tobacco considered the marketing of the food crops with top priority.

   The marketing management system of the food and other crops was taken into account in the first year (2009-2010) of the second phase. Detailed information on marketing of different crops was collected. Time line Technique of SAS was used to assess the past history and present status of marketing of different crops. Market price of winter vegetables and associated information were compiled for three regions under investigation for two years. The major winter vegetables are harvested during December - February. The farmers take these items for selling in the local markets. During two years of research market price of different crops were collected, for March - May 2010 and January - March 2011.

   This work has been done in two stages:

   Firstly, in the in the middle of the year, the marketing of crops in the off season were evaluated. Secondly after harvest of crops, market survey and information collection was done.

   The information was collected in the following two ways:

   ▪ Using Time line tool through SAS technique
   ▪ Information collected directly from hat, bazar, ware houses and retail stores.
SAS Tool: Time Line

Social Analysis System (SAS) Time Line of events was conducted in the agricultural history and development of the region with special reference to shifting agricultural practices, the introduction of new crops, market trends, government programmes or any other changes or events that contributed to the development of tobacco production. The Time Line was conducted in the villages of First phase Research such as Manikpur and Dardari and Maizpara and Panisharbeel villages included in the second phase in Chakoria, (Cox'sbazar); and Nayapara village of second phase in Bandarban. In Kushtia, Time Line was conducted in Bheramara, Kachuadaha and Chatian villages of Daulatpur and Mirpur upazillas and in Nazibpur and Borobaria of second phase.

Findings:

In the villages under first phase Manikpur and Dardari, the findings were the following:

i. Change in the weighing system: Since 1980s, there was a change of weighing system. Before 1980’s weighing system was in seer and mound. Forty seers was equivalent to one mound. One seer was subdivided to 16 chataks. Farmers felt that the change of the chatak, seer and mound to metric system such as gram and kilogram went in favour of the business men, rather than the farmers. Due to fractional change the margin and balance are enjoyed by business men. This problem has been encountered since the introduction of the metric system in the country in 1987 to date. The businessmen take advantage of the ignorance of the farmers about the change in the weighing system.

ii. Establishment of Army camp in Bandarban: Previously in 1979 the middlemen used to cheat the farmers in weight and measurement during buying and selling. This exploitation has reduced after the establishment of the Army camp in the Bandarban around 1981. However, this type of exploitation is still in practice elsewhere. The Army intervention in Bandarban has been in favour of the farmers, specially in the marketing of the products.

iii. Pourashava tax system: Prior to declaration of the areas as a municipality in the year 2000, the farmers had to pay only the hasil sales tax. After the declaration of the municipality the farmers have to pay both hasil as well as municipal tax. They are now subjected to double taxation system.

iv. Agricultural product selling sheds: Sheds have been constructed in the municipal areas for selling perishable agricultural products including cereal grains, pulses, fish, vegetables and other items. Previously in 2000 these items used to be sold in the open space. Now it is better than before because the products, buyers and sellers have recurred shed on top above and solid foundation below.

v. Intervention of Wholesalers: The primary producers have been benefited after the intervention in 2004 – 2005 of the whole sellers in the market. The whole sellers buy the produces from where these are abundantly available and sell in other places where these are needed much. The whole sellers are useful for marketing of products.

vi. Development of Road transportation: Because of the presence of Army in the area the road transportation has developed and thereby contributing to the convenience of the farmers to bring perishable agricultural products in short time to the market.
vii. Daily market: There used to be a 'Hat', i.e. twice a week marketing of agricultural products, but now it has changed to daily market to the benefit of the farmers.

In the Second phase villages such as Maizpara and Pannisharbeel, besides the common issues as the older villages, the findings were the following:

1. Bazar Auction: The market auction value has increased tremendously in the recent past (1995) due to inflation and other factors. Matching the auction value the hasil (sale tax) has also increased many times. The price of agricultural products has not increased matching the price of other essential commodities. The increment of auction value has affected the small farmers very much.

2. Reduction of vegetables in the market: Due to increase of tobacco production, the supply of agricultural products has reduced.

3. Smaller space in the market for selling by the farmers: The farmers are forced to sell to the middlemen as they do not get space to sit and sell their products.

In Bandarban, in the second phase villages of Nayapara the findings included the improvement of roads and transportation and weighing system changes and the following:

1. Establishment of Arat (Ware houses): The farmers have been benefited after the establishment of the Arot in 2005. The Arotdar (operator) acts as a safe custodian for selling of agricultural products. The farmers take the in products to the Arot and deposit for selling. The buyers from within the locality and also from outside come to the Arot and buy the products. The Arot has been a secured system of selling of the farm produce.

In Kushtia, the market assessment findings in the three villages Bheramara, Nazibpur and Borobaria were the following:

1. Loss of chaitali crops in the market: Since 1978, the loss of winter crops or "Chaitali fasal" such as pulses, lentils, winter vegetables, mustard etc. has caused market instability for farmers.

2. More hybrid crops, less local crops: In the vegetable cultivation, there is introduction of hybrid seeds which are more for commercial farming. Small farmers are not benefitted by such changes.
3. Introduction of Product tax in the market: Farmers have to pay tax to the market owners since 1991 even if they take a basket of vegetables such as egg plants. They have to pay tax in cash (Tk. 20) or in kind (1 kg of vegetable) i.e. the barter system. Small farmers are badly affected by such system.

4. Improvement in roads and transportation has led to the increase in the number of middlemen. Farmers are sometimes happy that they can sell vegetable from the field instead of going to the market.

5. Middlemen exploitation of farmers: Since the farmers do not get much space in the market, the middlemen can exploit the farmers with price.

1.c.ii. Marketing survey

Market survey was done from, hat, bazar, ware houses and retail store. The market information collected included i. Time of the market, days in the week, ii. the major products, iii. source of products, iv. Price of vegetables (price fluctuation), v. main buyers, vi. main sellers, vi. Taxation of the market, vii. Communication, vii. Whole sale and retail sale and viii. role of brokers and middlemen, etc.

Table 5: Market survey in the research areas

<table>
<thead>
<tr>
<th>DISTRICT</th>
<th>UPAZILA</th>
<th>MARKET</th>
<th>WAREHOUSE</th>
</tr>
</thead>
<tbody>
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<td>Chakaria</td>
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</tr>
<tr>
<td>Bandarban</td>
<td>Lama</td>
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<td>Bandarban</td>
<td>Alikodom</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Kushtia</td>
<td>Mirpur</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Kushtia</td>
<td>Daulatpur</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

The list of markets surveyed is presented in the following table:

Table 6: Markets surveyed

<table>
<thead>
<tr>
<th>MARKET</th>
<th>Union</th>
<th>Upazila</th>
<th>District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goru Bazar</td>
<td>Boroitoli</td>
<td>Chakaria</td>
<td>Cox’s bazar</td>
</tr>
<tr>
<td>Manikpur</td>
<td>Surajpur Marikpur</td>
<td>Chakaria</td>
<td>Cox’s bazar</td>
</tr>
<tr>
<td>Mogbazar</td>
<td>Chiringa</td>
<td>Chakaria</td>
<td>Cox’s bazar</td>
</tr>
<tr>
<td>Lamabazar</td>
<td>Lama</td>
<td>Lama</td>
<td>Bandarban</td>
</tr>
<tr>
<td>Ali kodom</td>
<td>Choikhong</td>
<td>Alikodom</td>
<td>Bandarban</td>
</tr>
<tr>
<td>Chatian</td>
<td>Chatian</td>
<td>Mirpur</td>
<td>Kushtia</td>
</tr>
<tr>
<td>Kochuadoh</td>
<td>Fulbaria</td>
<td>Mirpur</td>
<td>Kushtia</td>
</tr>
<tr>
<td>Borogangdia</td>
<td>Kholishakundi</td>
<td>Daulatpur</td>
<td>Kushtia</td>
</tr>
</tbody>
</table>

In addition to collection of information on market price (as shown in the Annexure), the location of the market, geographical boundary, size, distance from the nearby market communication system, source of goods, Buyers, market fluctuation, scope for fair price were also collected.

It appeared from the market information collected from Cox’s bazar that 80 percent of the food crops were imported from outside. The production of vegetables in the locality has been reduced due to cultivation of tobacco. However, since there is lack of vegetable production, the price remains high, but it goes down once there is
abundance in supply. But more often, the supply is much less than requirement. But since there is no price control mechanism, market of food crops remain much unstable. There is no definite marketing policy and no systematic market management. The market management committee does not play any role. Rather there is significant interference by the brokers. As a result, the small retailers are affected.

The price of the locally produced food crops comes down to rock bottom for lack of good transportation services with neighboring markets. Moreover, a marketing syndicate has been established for import of food crops from outside the locality. This syndicate exploits the small and marginal farmers. The locally produced items meet about 25 percent of the need and the rest 75 percent are imported from outside. The local people may have some control on the market provided the goods are produced internally. That is limited for large scale coverage of area for production of tobacco. (Appendix 2)

It was revealed from research conducted in the first year (2009-2010) that there was a syndicate controlling the local market, warehouse and other aspects of marketing. Under the cover of the syndicate the middlemen and brokers are exploiting the ordinary buyers and the sellers. There is no set government policy on the market management. The local market has been running without any systematic policy.

An efficient and organized marketing system for the locally produced items is urged in order to encourage the farmers to produce food and other essential crops by shifting out of tobacco. Further research is also needed for marketing of locally produced vegetables, pulses, oil seeds, spices and other items.

1.d.i. Design and implement field experiments

Base line information was the first step of activity in a new area. Village level meetings were organized involving the farmers and other members of the society. The main topics for discussion in the village level meeting included introduction of the organizational activities, role of Nayakrishi, adverse impacts of tobacco production, biodiversity and maintenance of environmental balance.

Village level Meetings: Village selection and survey were conducted in the beginning of the second year (2010-2011) of the second phase. Village level discussions were held after the village survey. In these meetings, the farmers wanted to know about UBINIG and the research on shifting out of tobacco. They talked about the hazards of tobacco production and its impact on loss of crops. For transition out of tobacco, Nayakrishi farming practices, which does not use any chemical inputs and uses local variety seeds, were discussed. Farmers discussed how they can get involved in growing foods and not tobacco.

The meetings at village level with the interested farmers to shift out of tobacco were very important mechanism to develop community relationship. These meetings were held in open spaces, where other people such as the tobacco farmers, public representatives, owners of land, village level doctors, school teachers and the general people can observe and listen to the discussions.

The adverse impacts of Tobacco were discussed at length. Women in the farming families actively participated in the meetings. They highlighted the harmful impacts of tobacco on women and children. The tobacco farmers, those who had incurred loss by growing tobacco, shared their pitiable conditions. Many farmers expressed their desire for shifting out of tobacco and to grow food crops.
The status of village level meeting held is presented in the following table:

Table 7: Village meetings held during 2009 - 2011 in three research sites

<table>
<thead>
<tr>
<th>DISTRICT</th>
<th>Upazila</th>
<th>No. of Meetings Held</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Kushtia</td>
<td>Mirpur</td>
<td>4</td>
</tr>
<tr>
<td>2. Kushtia</td>
<td>Daulatpur</td>
<td>2</td>
</tr>
<tr>
<td>3. Bandarban</td>
<td>Alikodom</td>
<td>4</td>
</tr>
<tr>
<td>4. Bandarban</td>
<td>Lama</td>
<td>2</td>
</tr>
<tr>
<td>5. Cox’sbazar</td>
<td>Chakaria</td>
<td>4</td>
</tr>
</tbody>
</table>

**Selection of farmer:** The sharing of farmers on the adverse impacts of tobacco cultivation on human health, soil, biodiversity and environment were noted down. Almost in every meeting, newer farmers expressed interest to give up tobacco production. At this stage the interested farmers were selected and listed. Field visits were made in the area for collection of further information.

The discussions on the harmful affects of tobacco production at the village level meetings made farmers more aware. They expressed their interests for growing food and other crops. However, they needed the supply of seeds of the selected food crops. They were willing to be part of research for shifting out of tobacco.

Based on the interest of the farmers the selection of farmers begun. The farmers were selected on the basis of following two methods:

1. Collection of information and investigation on the spot
2. Using SAS Tool

In the second phase, certain rules and principles were followed for selection of farmers for participation in the research. These included:

1. Those farmers who were involved with tobacco production up to last year (2009)
2. To grow food crops on the same land where tobacco was grown previously
3. To free the farmer and also his/her land from tobacco production
4. To release the total land of the farmer out of tobacco
5. The farmer is land owner and will be growing crops on own land

These principles were followed for selection to hold the farmers in food crop production. Considering all these points it was decided that both the farmers and the land must be free from tobacco production. This is a precondition for sustaining the transition from tobacco production. On the basis of the above principle, the farmers were visited in their residences, visited their cultivable land and considered all other conditions for selection of farmers in this program.

**SAS Exercise: Social Domain Household Profile of farmers**

Social Analysis system (SAS) was conducted involving the farmers for consolidation of information. In the first phase, farmers were selected through household profile of social domain. This profile of farmers appeared quite effective and efficient. Accordingly the same technique used in the First Phase of the Research was used in the second phase for selection of farmers.
The interested farmers were invited to a meeting. SAS exercise was conducted involving the farmers. The criteria for selection of the farmers through the House Hold Profile of SAS included the following:

1. The farmers grow crops on their own land
2. Interested to stop tobacco production
3. Affected by tobacco production
4. Experience of growing crops in mixed culture
5. Committed to give up tobacco production
6. The farmer has enough land in the homestead area for practicing Nayakrishi
7. Interested to crop production in Nayakrishi principles
8. The farmers grow rice and other crops hosed on seasons in addition to growing tobacco in rabi season.

The farmers were finally selected after an on-the-spot visit to their houses and field plots of the farmer followed after making the profile as per SAS.

The list was finalized on the basis of the Household profile of SAS. Interested farmer selected in the first year of second phase along with those farmers included in the first phase, Nayakrishi experienced farmers were included in the field level experiment.

During 2010-2011 the farmers were selected in the same method. However, more rigorous scrutiny was applied in the second year of research keeping the experience of the first year in view. It was reflected from the results that those farmers who had given up tobacco production would not grow tobacco in future. It is indicative of the fact those who had given-up tobacco they did it with confidence. They shifted out of tobacco for ever. Many farmers who had grown food crops shifting out of tobacco during 2009-2010 they grew food crops following year with their own initiatives. None of them have any feeling to grow tobacco again.

Table 8: The final list of selected farmers for 2009-2011 is given in the following

<table>
<thead>
<tr>
<th>DISTRICT</th>
<th>Union</th>
<th>Village</th>
<th>Number of Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Kushtia</td>
<td>Refayetpur</td>
<td>Bheramara</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Khalishakundi</td>
<td>Najibpur</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Sadarpur</td>
<td>Barabaria</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Chatian</td>
<td>Chatian</td>
<td>06</td>
</tr>
<tr>
<td></td>
<td>Kachuadaha</td>
<td>Fulbaria</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Fulbaria</td>
<td>Tilkandra</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Khalishakundi</td>
<td>Protappur</td>
<td>14</td>
</tr>
<tr>
<td>2. Cox’sbazar</td>
<td>Boroitoli</td>
<td>Maizpara</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Boroitoli</td>
<td>Khoiratipara</td>
<td>06</td>
</tr>
<tr>
<td></td>
<td>Kakara</td>
<td>Maizkakara</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Kakara</td>
<td>Uttarlotoni</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Surajpur Manikpur</td>
<td>Manikpur</td>
<td>04</td>
</tr>
<tr>
<td></td>
<td>Surajpur Manikpur</td>
<td>Uttar Surajpur</td>
<td>04</td>
</tr>
<tr>
<td></td>
<td>Bomubilchori</td>
<td>Pannissarbeel</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Bomubilchori</td>
<td>Mazipara</td>
<td>12</td>
</tr>
<tr>
<td>3. Bandarban</td>
<td>Lama Sadar</td>
<td>Sabekbeel Chari</td>
<td>04</td>
</tr>
<tr>
<td></td>
<td>Ruposipara</td>
<td>Anglapara</td>
<td>09</td>
</tr>
</tbody>
</table>
ANALYSIS OF HOUSEHOLD PROFILE:

**Household Profile of farmers:** The project convened groups of farmers interested to design and implement field experiments. The SAS method of Social Domain was used using RepGrid IV for analyzing the profile of the farmers interested in shifting out of tobacco and carry out food production. (Appendix 3)

**a. Cox’sbazar (Chakaria)**

In Panniasharbil village, the farmers have to take land on lease for tobacco. The lease price is increasing. Farmers are becoming indebted to money lenders and the company. But unfortunately, there is no support for other crops except tobacco. So farmers have no option but to cultivate tobacco. The Agricultural officers are not seen in the village. The loans received for vegetable cultivation is much less than what is received for tobacco.

Tobacco farming in large amount of land means higher social status. The company gives them more support and can show that they are powerful. On the other hand, poor farmers growing food crops are not considered to be people of higher status.

In Bomubilchari village, farmers consider tobacco cultivation as a problem because it demands hard work by all family members. They fall sick, even there are not family members who are well and can look after others. If they calculate the income and expenditure, then it is not profitable. The non-monetary loss of tobacco is far greater than the cash profit. Even they cannot sleep in a peaceful mind. Children miss their schools during the days when leaves are harvested. So the drop out from school increases. Anwar Hossain said, that he did not gain at all from tobacco cultivation, rather he has become indebted. Khairul Amin said, that they did not have so much health problems before, now it is common in all the tobacco farmer families. Soil fertility is lost, the environment including water and air is polluted.

Tobacco cultivation brings cash money, but they have to purchase everything for survival from the market. They are no more self-dependent.

**b. Bandarban**

In the Ali Kadom upazilla of Bandarban district, the farmers who showed interest in shifting out of tobacco participated in the SAS exercise.

In the Moktar Sardarpara village Mong Eching gave an account of indebtedness to the tobacco company. He said, he has been cultivating tobacco for 12 years. In the beginning it was only on 40 decimal lands and got 12000 Taka profit. Encouraged by this, he increased land under tobacco in 2 Kani land and got 24,000 Taka profit. Again he increased tobacco cultivation in 8 Kani land but this time
company claimed that he is indebted to the company by an amount of 150,000 Taka. He does not have own land. Now to repay company loan he is forced to carry on the tobacco cultivation.

If vegetable is grown, then there is no transport to take to the market. So they are forced to sell at much lower price in the local market or to the middle men.

Basically it was revealed that the farmers are helpless and are trapped into the tobacco cultivation.

c. Kushtia

In the two new villages, Fulbaria and Tilkandra of Mirpur Upazilla, farmers expressed interest in shifting out of tobacco because after many years of tobacco farming, the soil fertility has been lost, and are experiencing the infest of super weed “Mula” in their land. They earn cash money from tobacco cultivation but have to spend it for treatment of illness of family members. The productivity of tobacco has reduced. They had to cut the trees in their homestead for cure the leaves. Those who do not have their own Kiln, are not allowed to use other farmers’ kilns for curing. Children cannot go to school.

The farmers, however, mentioned that the tobacco company ensures tobacco cultivation by farmers by providing all necessary inputs. They do not have to incur any cash cost to buy those inputs. They sell the tobacco leaves to the company card holder ‘farmers’. Those who participated in the SAS exercise were not card holders, but they have access to company benefits through the card holders.

The non-card holder farmers do not get any facility directly from the company nor they can sell the tobacco leaves to company agents. They sell to the ‘Beparies’ – the middlemen. The farmers are in illusion of apparent cash earning and ‘profit’ from tobacco.

On the other hand, no agricultural officer ever visits them or gives them any suggestion for growing food crops. They alleged that the agricultural officers, i.e. the Block Supervisors, go to rich farmers’ house, and never look at the poorer farmers.

Farmers also mentioned that due to cultivation of tobacco over a period of thirty years, most farmers forgot how to grow food crops. They do not have any draught animals and also do not have the seeds. The soil has lost fertility so food crop are difficult to grow.

There were many frustrations and disappointments experienced in tobacco production. They did not get back the cost spent on fertilizers and other inputs after selling tobacco leaves. The soil fertility is almost lost and as a farmer it is not acceptable to see such condition. Tobacco farming needs hard labour and with few family members it is difficult to maintain. The indebtedness is increasing day by day. One farmer Habibur mentioned that he had to sell cows and goats to repay the loan. Moinuddin felt cheated by the company when they sell the leaves. In the off season, they have to sell assets like goats to buy food. To recover from the loan it may take three to four years.

Farmers can see that the trees are no more in the village because of tobacco curing. Bablu said, women in the family are sick and the children are not able to go to school. In the family they have lost peace. They rebuke each other because they are unhappy.

These were very concrete reasons for the farmers to be willing to shift out of
tobacco cultivation. However the main issues that surfaced from the farmers experiences is that in order to keep the farmers remain out of tobacco they must be supported with inputs such as seed, fertilizers, irrigation and most importantly marketing for food crops.

1.d.ii Crop selection

Food production was the main objective of the research for shifting out of tobacco. Crop Calendars of the respective research areas were prepared. A list of the crops was made including the crops grown previously, crops eroded in the mean time, crops showing declining acreage and the crops grown side by side with tobacco. The list of crops was made on the basis of focus group discussion, individual interview, observation and secondary data from literature survey.

Table 9: Crops cultivated by farmers before tobacco cultivation in Chakaria, Lama and Alikadam

<table>
<thead>
<tr>
<th>Winter crops</th>
<th>Summer and rainy season crops</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potato</td>
<td>Ripped gourd</td>
</tr>
<tr>
<td>Tomato</td>
<td>Snake gourd</td>
</tr>
<tr>
<td>Brinjal/ Eggplant</td>
<td>Teasel gourd</td>
</tr>
<tr>
<td>Chill</td>
<td>Bitter gourd</td>
</tr>
<tr>
<td>Sweet Potato</td>
<td>Cucumber</td>
</tr>
<tr>
<td>Ground nut</td>
<td>Turmeric</td>
</tr>
<tr>
<td>French bean</td>
<td>Yam bean</td>
</tr>
<tr>
<td>Winged Bean</td>
<td>Ginger</td>
</tr>
<tr>
<td>Bottle gourd/Water gourd</td>
<td>Jute</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>Indian spinach</td>
</tr>
<tr>
<td>Cabbage</td>
<td>Red Amaranth</td>
</tr>
<tr>
<td>Coriander</td>
<td>Amaranth</td>
</tr>
<tr>
<td>Turnip</td>
<td>Yard long bean</td>
</tr>
<tr>
<td>Yam bean</td>
<td>Aus Paddy</td>
</tr>
<tr>
<td>Carrot</td>
<td>Aman Paddy</td>
</tr>
<tr>
<td>Radish</td>
<td>Okra</td>
</tr>
<tr>
<td>Country Bean</td>
<td>Pointed gourd</td>
</tr>
<tr>
<td>Water melon</td>
<td>Taro/Arum</td>
</tr>
<tr>
<td>White skinned melon</td>
<td></td>
</tr>
<tr>
<td>Cucumber</td>
<td></td>
</tr>
<tr>
<td>Onion</td>
<td></td>
</tr>
<tr>
<td>Garlic</td>
<td></td>
</tr>
<tr>
<td>Mustard</td>
<td></td>
</tr>
<tr>
<td>Rape seed</td>
<td></td>
</tr>
<tr>
<td>Taro</td>
<td></td>
</tr>
<tr>
<td>Maize /Corn</td>
<td></td>
</tr>
<tr>
<td>Sesame</td>
<td></td>
</tr>
<tr>
<td>Sweet gourd</td>
<td></td>
</tr>
<tr>
<td>Lentil</td>
<td></td>
</tr>
<tr>
<td>Black-gram</td>
<td></td>
</tr>
<tr>
<td>Boro paddy</td>
<td></td>
</tr>
</tbody>
</table>
Table 10: Change of crops due to tobacco cultivation in Chakaria, Lama and Alikadam

<table>
<thead>
<tr>
<th>Winter food crops replaced by tobacco</th>
<th>Common crops replaced by tobacco</th>
<th>Crops that farmers are continuing in small scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rape seed</td>
<td>Cucumber</td>
<td>Potato</td>
</tr>
<tr>
<td>Mustard</td>
<td>Water melon</td>
<td>Tomato</td>
</tr>
<tr>
<td>Lentil</td>
<td>White skinned melon</td>
<td>Brinjal / Eggplant</td>
</tr>
<tr>
<td>Black-gram</td>
<td>Turnip</td>
<td>Chili</td>
</tr>
<tr>
<td>Onion</td>
<td>Taro</td>
<td>Sweet Potato</td>
</tr>
<tr>
<td>Garlic</td>
<td>Elephant foot (root crop vegetable)</td>
<td>Ground nut</td>
</tr>
<tr>
<td>Carrot</td>
<td>Maize /Corn</td>
<td>French bean</td>
</tr>
<tr>
<td>Sesame</td>
<td></td>
<td>Winged Bean</td>
</tr>
</tbody>
</table>

Table 11: Crops Cultivated before Tobacco introduced in Kushtia

<table>
<thead>
<tr>
<th>Kharif-1 Season (March-August)</th>
<th>Winter-Season (September-February)</th>
<th>Crops Reduced due to Tobacco Cultivation</th>
<th>Crop Cultivation Stopped due to Tobacco Cultivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.gourd</td>
<td>10. Okra</td>
<td></td>
<td>10. Sesame</td>
</tr>
<tr>
<td></td>
<td>15. Rigged gourd</td>
<td></td>
<td>15. Mesta Jute</td>
</tr>
<tr>
<td></td>
<td>16. Snake gourd</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>17. Spinach</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>18. Indian spinach</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>19. Tomato</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20. Dauta(Amaranth )</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21. Onion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>22. Garlic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>23. Coriander</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The experience of research during 2006-2008 in terms of crop selection, field observation and experimentation were used. As a result, the combination of crops was much higher than the phase 1.

SAS tool, Ecological Domain was used for crop selection on the following aspects:

1. Select the crops and varieties matching farmer’s needs and capability.
2. Crops those are suitable for local market
3. The crops that match the experience of the farmers
4. The crops those are friendly to other crops
5. Crops those are compatible to mixed cropping
6. Crops those meet the food requirement of the locality
7. The crops those enriches the soil fertility
8. The crops these are much on demand in the locality
9. The crops those have stable need in the market round the year

Based on the above mentioned criteria, SAS was conducted for crop selection. Special attributes of the crops were determined through the exercise of Ecological Domain of SAS. The participants for crop selection though SAS included:

- Nayakrishi farmers
- Tobacco growers
- Food producing farmers
- Conventional farmers
- The farmers, who have shifted out of tobacco in the mean time
- Representatives of other professions

However, the final list was approved by the farmers involved in the Field Experiments in their respective areas. The farmers used SAS technique of Ecological/Option Domain for crop selection.

**Crop Characteristics: Ecological / Option Domain to arrive at descriptions of crop characteristics of interest to farmers**

In the new Study areas of Bandarban, Nayapara and Shapmararjhiri Ecological domain was exercised to identify crop characteristics on the basis on sustainable seed system. In Cox’sbazar, the exercise was done in Maizpara and Pannisharbeel. In Kushtia exercise was done in Borobaria and Nazibpur villages. (Appendix 4)

In the second year (2010 – 2011) the farmer in Kushtia from all the old and new villages got together to discuss the crop selection characteristics on the basis of their experiences and through the exercise of Ecological Domain. About 20 farmers, including the leading Nayakrishi farmers in these villages joined the exercise for selection of crops. They discussed the crops grown in the First phase which included 1. potato, 2. wheat, 3. garlic, 4. coriander, 5. lentil (masur) 6. mustard, 7. paddy etc. This time they emphasized on a sustainable seed system that can help farmer continue to grow food crops and which will ensure improve soil fertility, meet family food needs, can be marketed easily and can be grown in a mixed cropping system. They prepared a long list of crops that are familiar in the region and can be grown by the farmers. These were the following:
1. potato, 2. wheat, 3. garlic, 4. coriander, 5. lentil (masur) 6. mustard, 7. paddy, 8. corn, 9. khesari 10. radish, 11. onion, 12. chili, 13. black gram, 14. tomato, 15. cauliflower, 16. cabbage, 17. spinach, 18. bean, 19. pumpkin, 20. red spinach. Tobacco was added as an option if none of these are grown by the farmers or to compare the relative benefit and losses.

Among these a short list of 10 crops and tobacco was selected for Ecological Domain analysis. The ten crops were 1. potato, 2. wheat, 3. garlic, 4. coriander, 5. lentil (masur) 6. mustard, 7. paddy, 8. corn, 9. onion, 10. chili, and 11. tobacco.

The consideration for crops were for resisting pest attack, less irrigation and chemical fertilizer, less hard work and cost, improving soil fertility and to be sold all round the year were given much importance by the farmers in selecting the crops.

Similarly in the Paddaboti Biddaghor, the farmers got together to discuss crops to be grown as a way of shifting out of tobacco. They made a list of crops that are grown by farmers in their area. These were:


Among these crops a short list on the basis some relevant criteria for farmers to shift out of tobacco was made. The criteria were 1. to have good output in the season, 2. can be sold in the market, 3. can meet farmers needs round the year, 4. can save seeds, 5. can use the experiences of the farmers, 6. can improve soil fertility, can meet food shortage etc. The short list was as follows:

1. peanut,, 2. felon, 3. rangima sheem (French bean), 4. sweat potato, 5. potato, 6. radish, 7. tomato, 8. sweat gourd, 9. egg plant, 10. chili, 12. okra, and 11. tobacco.

**Experiment at Field Level:**

Farmer selection is followed by crop selection. Experiment at field level started after final selection of crops. These activities started with Transition Crop during Ashar- Bhadra (mid July to mid September) and continued with substitute crops during Kartik – Chaitra (November – February). These transition crops were of short duration and the substitute crops were done as mixed combination crop. The considerations in this context were to improve soil fertility, earn cash
income, increase crop diversity and ensure food security.

The farmers took preparation for rabi crops after harvest of the transition crop. The farmers grew food crops in rabi season in place of tobacco. These farmers do not like tobacco farming anymore because high doses of chemical fertilizers and pesticides are used and also it destroys biodiversity. However, it was a challenge for the farmers to grow food crops in Nayakrishi principles i.e. without using any chemical fertilizer and pesticide in the degraded land created by tobacco cultivation.

**Table 12: Farmers and land under transition and substitute crops for experiments in the second phase**

<table>
<thead>
<tr>
<th>DISTRICT</th>
<th>Upazilla</th>
<th>Union</th>
<th>Number of Farmers</th>
<th>Land (Acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Kushtia</td>
<td>Daulatpur</td>
<td>Refayetpur Khalishakundi</td>
<td>45</td>
<td>17.23</td>
</tr>
<tr>
<td></td>
<td>Mirpur</td>
<td>Sadarpur Chatian Kachuadaha Fulbaria</td>
<td>57</td>
<td>29.47</td>
</tr>
<tr>
<td>2. Cox’sbazar</td>
<td>Chakaria</td>
<td>Boroitoli Kakara Surajpur Manikpur Bomubichori</td>
<td>70</td>
<td>32.8</td>
</tr>
<tr>
<td>3. Bandarban</td>
<td>Lama</td>
<td>Lama Sadar Ruposipara Gazalia</td>
<td>23</td>
<td>7.70</td>
</tr>
<tr>
<td></td>
<td>Alikadam</td>
<td>Choikhang</td>
<td>26</td>
<td>10.9</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>221</td>
<td>97.10</td>
</tr>
</tbody>
</table>

**1.d.iii SAS Tools**

**WHEEL: Baseline for the potential success of the food crops**

A Baseline for Crop assessment through loss, gain and sustainable management was done by using SAS technique of WHEEL.

Experienced/old farmers In Cox’sbazar, WHEEL exercise was done in Pannisharbeel beel village and Maizpara.

In Pannisharbeel, the alternative crops selected were sweet gourd, Felon, potato, tomato and radish. The indicators for assessment of the success were 1. marketability, 2. seed keeping, 3. food source, 4. increase fertility of land, 5. less labour and remain healthy and 6. economically better off.

Among these indicators the marketability and the seed keeping received highest (5 out of 5) scores, the other four indicators received 4 out of 5.
In Maizpara, the alternative selected were potato, French bean, radish, sweet gourd and felon. The indicators for assessment of the success were 1. marketability, 2. seed keeping, 3. year-round food source, 4. increase fertility of land, 5. remain healthy and 6. high productivity.

Among these indicators the remaining healthy and the seed keeping received highest (5 out of 5) scores, the other 3 indicators such as marketability, high productivity and year round food source received 4 out of 5 and only increasing of fertility received 3 out of 5.

**Bandarban, WHEEL exercise in Shapmarajhiri**

In Shapmarajheel, the alternative selected were potato, French bean, radish, sweet gourd, tomato, onion and felon. The indicators for assessment of the success were 1. good selling opportunities, 2. seed keeping, 3. food not to be bought from market, 4. increase fertility of land, 5. remain healthy and 6. high productivity.

Among these indicators the remaining good selling opportunities and the seed keeping received highest (5 out of 5) scores, the other 2 indicators such as high productivity and less dependence on market received 4 out of 5 and only increasing of fertility and remaining healthy received 3 out of 5.

**Kushtia, WHEEL exercise in Nazibpur and Borobaria**

In Nazibpur, the alternative selected was potato, wheat, paddy and coriander. The indicators for assessment of the success were 1. food security, 2. increase fertility of land, 3. marketability, 4. seed keeping, 5. Increase of income and 6. remain healthy.

Among this food security, marketability seed keeping and remain healthy received 4 out of 5 scores and the rest received 3 out of 5.

In Borobaria, the alternative crops selected were potato, wheat, paddy, coriander and red spinach. The indicators for assessment of the success were 1. high productivity, 2. increase fertility of land, 3. marketability, 4. seed keeping, 5. Increase of income and 6. remain healthy.

Among these marketability received 5 out of 5 scores, seed keeping received 4 out of 5, high productivity and increased income received 3 out of 5 and the rest received 2 out of 5.

**ANAYSIS OF WHEEL Assessment in the second year**

In the second year 2010 – 2011, farmers from new and old villages selected crops in the research villages on different considerations. From the assessment of the Agricultural economist these crop combinations were profitable in all three areas compared to tobacco cultivation. However, as assessment was also done using SAS tool WHEEL with the following indicators:

1. marketability, 2. seed keeping, 3. food source,
4. increase fertility of land, 5. less labour and remain healthy and 6. economically better off.

These are important criteria for sustainable shifting out of tobacco. The outcome was the following:

In Kushtia villages the crop combination was Potato+maize+
garlic+coriander; in Chakaria it was Potato+french bean+felon+radish and in Bandarban Potato+french bean+coriander +sweet gourd.

In all the three areas it was found that the crop combinations ensured marketability, to be economically better and less labour and to remain healthy as important criteria. The seed keeping got fewer score in Kushtia and also in Bandarban and Cox’sbazar because of the potato, which needed to be kept in cold storage and have to buy from the market. Similarly in the food source, Kushtia crop combination had more cash value for garlic and coriander rather than being a food source such as potato and maize. In Cox’sbazar and Bandarban felon, sweet gourd, and French bean are food source as well as cash income. The increase of fertility got very different scores in three areas. For the new farmers in the research they knew that the crops for fertility replacement will not bring enough cash, so they emphasized on economic values. However none of them used any chemical fertilizer, they used compost instead. They did not use any pesticide. And among the combination, there was at least one crop which had soil nutrition quality such as French bean, coriander, felon etc.

1.e. Monitoring field experiment

The field level experiments have been systematically monitored from beginning to completion. The farmers, researchers and other workers have been recording the observations step by step. In addition the farmers have been offered necessary cooperation and assistance. The experiment farmers have observed the activities of the newly introduced farmers and offered necessary advice based on needs. The UBINIG workers also visited the activities of the farmers and the experiment farmers 3/4 times a week. In addition the senior Researchers from the UBINIG Centers and the consultants also periodically visited the fields and worked with the farmers. The activities were monitored from the field level to centers level in different phases. The activities have been implemented with the help of group discussion, individual discussion, mutual cooperation and coordination.

Every step of work was documented with photographs, video and data recording. Pictorials, group discussion, field level activities have been taken up in different phases of work.

Photographs, documentations, videos have been used for publications and presentations in newspapers, anti-tobacco advocacy, meetings, discussions and the final report of the research

1.f. Assess the Economic Performance of crop Combination

The assessment of crop performance was very important as the farmers had to face the question whether shifting out of tobacco will at all be profitable. Therefore it was important for this research to record the cost of production step by step, return from production, analyze the cost and return of different crops, crop combination, and make comparative net return from different crops and combinations. The farmers, those who have shifted from tobacco to food production, have also been maintaining their assessment of production in terms of cost and return.

Mr. Mosharraf Uddin Mollah, Agriculture Economist has prepared a report assessing the economic performance of crop combinations for the first year of the second phase of research. (Appendix 5)

In the second year (2010-2011) he conducted the same
research with a different dimension. Previously, the tobacco farmers were compared with Nayakrishi farmers or the farmers those who have shifted out of tobacco. This year the Nayakrishi farmers, the farmers those who voluntarily shifted out of tobacco, those farmers who have shifted out of tobacco under pressure from Government presume, have been compared with tobacco farmers. The cost of production, accounts of income and expenditures of the different types of farmers and cropping options have been compared for preparation of the report. These two reports will be appended with the final reports of the research for 2009-10 and 2010-11.
2. INSTITUTIONAL DEVELOPMENT

Specific Objective 2: Pilot a farmer-based model of seed supply and technical assistance

2. a.i Facilitate farmer access to agricultural seed through the Nayakrishi Andolon:

The Nayakrishi Andolon (New Agricultural Movement) of Bangladesh is a movement for biodiversity-based farming. It is based on 10 simple principles like no use of pesticides and chemicals, soil management rather than external input of fertilizers and practice of mixed cropping and crop rotation for pest management and risk reduction. Mixed cropping is crucial to increase productivity through management and production of biodiversity, rather than quantitative yield of a single monoculture crop. The central approach of the initiative squarely lies in the conservation, management and use of local seed and genetic resources and adopting and improving production techniques suitable for farmers' seed. Thus hundreds of local varieties of rice, vegetables, fruit and timber crops, etc., have been reintroduced within a short period of time. For example, farmers in Nayakrishi area cultivate at least 3000 varieties of rice, and the number is increasing. The movement now is negotiating with the national gene bank to help them regenerate the collected germplasm and internalize the conservation of genetic resources as an in built operation of the movement.

The success of the approach is directly related to the commitment of the movement to evolve upon the local and indigenous knowledge system and critically integrates the success, failures and insights of the modern science. The movement does not mechanically separate formal and informal knowledge systems, and does not subscribe to the two-system theory of knowledge. It strongly believes in the capacity of the farmers as authentic knowledge producer, no matter how it is articulated, orally or otherwise. At least 300,000 farmers in 19 districts of Bangladesh practice Nayakrishi. In all the farming households women are the key persons to preserve seeds.

The Nayakrishi Seed Network

The Nayakrishi Seed Network (NSN) builds on the farming household, the focal point for in-situ and ex-situ conservation. Farmers maintain diversity in the field, but at the same time conserve seed in their homes for several years to be replanted in the coming seasons. The seeds that are kept for longer periods generally have lower germination rates, but the technology farmers use to preserve these seeds is varied and effective, both for and short term. For example, specific drying techniques, the use of particular kinds of earthen pots, the use of Neem leaves and other natural pesticides, and experiential understanding of the moisture content of the various seeds. Seed conservation is an art belonging to women, and is the key element in building up a national seed network. The women are the key actors and leaders in the NSN.

The precise responsibility of the NSN, within the ecological food production practices and organizational activities of Nayakrishi Andolon is to ensure collection, conservation, distribution and enhancement of seeds/germplasms among the members of Nayakrishi Andolon. Therefore, the NSN is the active farmers' network within Nayakrishi Andolon with specific responsibility of ensuring both in-situ
conservation of biodiversity and genetic resource in the farming field and ex-situ conservation at the household and community level.

Community Seed Wealth Centre

Community Seed Wealth (CSW) is the institutional setup in the village that articulates the relation between village and the National Gene bank. The CSW also maintains a well-developed nursery. The CSW can easily finance its maintenance from the income of the nursery as well as from seed sale.

The construction of CSWs is based on two principles: (a) they must be built from locally available construction materials and (b) the maintenance should mirror the household seed conservation practices. Any difficulty encountered in the CSW reflects the problem farmers are facing in their household conservation.

Any members of the Nayakrishi Andolon can collect seed from CSW with the promise that they will deposit double the quantity they received after the harvest. The seeds are sold to other farmers of the village and the cost of the CSW is maintained from the income. Farmers can claim the deposited specie or a variety any time they want.

Nayakrishi Seed Network is built up from below by the independent initiative of one or two households in the village, belonging to Nayakrishi Andolon, who are willing to take responsibility to ensure that all common species and varieties are replanted, regenerated and conserved by the farmers. These households in a particular village can also be located by the existing NSN structure covering large areas. These households are known as Nayakrishi Seed Huts (NSH). The farmers collect and deposit different seeds in the Seed Hut and use at the time of their need.

For the farmers in tobacco growing area, Nayakrishi farming practice was not known. But once the farmers decided to shift out of tobacco Nayakrishi farmers were willing to provide necessary training and seed support to the farmers so that they can produce food crops without incurring huge cost of inputs such as chemical fertilizers, pesticides and irrigation. They did not have any seed that were grown before tobacco was introduced in their areas. Nayakrishi farmers helped build seed huts and arranged for exchange visits to the Nayakrishi Community Seed Wealth Centres.

Farmers’ visit to Community Seed Wealth Centres

As an effort for seed management, farmer visit programmes to see the seed system were organized. The interested farmers visited the seed Akhra and the Community Seed Wealth Centers (CSWC) with a view to growing food crops in the tobacco growing areas, strengthening Nayakrishi activities, involving the tobacco farmers with management activities and acquainting than with Nayakrishi Seed Network (NSN). NSN took the lead of these activities. A total of 60 farmers including men and women visited Seed Akhra and the CSWC at Padmaabati Biddaghar in Chakoria in two years from Bandarban and Chakaria visited CSW in Paddabati Biddaghgar.

The farmers visited the on going activities of the CSWC; collection, conservation, regeneration and utilization of genetic resources. The visit also included the following activities:

- On the spot observation of the CSWC
- Learn the process of seed conservation and regeneration
- Management of seed in the store and in the field
- Seed germination and viability
- Identification of varieties
- Seed regeneration

Based on the needs of the farmers seeds were collected through the Nayakrishi Seed Network (NSN) and also from the nearby villages where there is no tobacco production. The crops grown in lieu of tobacco in the rabi season were selected by the farmers and were grown according to Nayakrishi principles. These crops were originally grown in the area, so the farmers refuse to call them substitute or alternate crops. In fact, tobacco is considered as an aggressive crop itself. So the crops grown are called the original crops. In rabi season the farmers have diversified crops including the major food crops.

Some principles are followed for distribution of seeds among the farmers. These include:

1. Nayakrishi principles must be followed for raising the crop.
2. It will not be grown in monoculture
3. Preferably grown in mixed or intercropping systems.
4. The farmers will return the same amount of seed after the harvest of the crop
5. The farmers will save seed on farm for sowing in the next season

2. Facilitate farmer access to Agricultural seed through the Nayakrishi Andolon - Visit to CSWC Seed hut at Regional level

The Nayakrishi Seed Network has been playing a key role since the beginning of this action research. It has been offering support to the farmers under research in terms of supply of seeds, training and other technical advices such as pest management, irrigation with surface water etc. As the farmers in the tobacco growing areas have lost the seeds of food and other crops due to cultivation of tobacco for long time, the supply of seed became a key factor when the farmers decided to grow food and other crops by stopping tobacco production. As a result, the Nayakrishi Seed Network became the dependable source of supply of seeds.

The newly selected farmers during 2010-2011 were introduced with the members of Nayakrishi Seed Network and the Community Seed Wealth Center. A representation of were 30 farmers in the team including 25 farmers (Female 16 and male 9) and 5 representatives of the Nayakrishi Seed Network visited the Community Seed Wealth (CSWC) at Padmabati Biddaghar at Chokoria, Cox’sbazar.

The three days long visit program of the farmers included the following:

1. The activities of the Community Seed Wealth Center
2. Demonstration of seed conservation and regeneration practices
3. Germination and viability test of seeds
4. Selection of varieties and species
5. Research on local varieties of rice
6. Center agricultural activities

7. Discussion with the Nayakrishi farmers

8. Exchange of seeds with Nayakrishi farmers

The farmers from tobacco growing areas shared felon, French bean, stem amaranth, cucumber water melon, ridge gourd, sweet gourd, and radish seed with the Nayakrishi farmers. In turn the Nayakrishi farmers shared ten varieties of amon rice, coriander radish, okra, Indian spinach, chili, tomato, bitter gourd and yard long bean seeds with the farmers from tobacco growing areas.

Results:

The farmers from tobacco growing areas learnt from the Nayakrishi farmers the method of seed management in the community as well on-farm conservation. The farmers from the tobacco growing areas were exposed to the whole array of seed management in terms of conservation, use, exchange, and regeneration as has been practiced by the Nayakrishi farmers. It was an interesting learning for them that a very strong system can be developed with farmer based seed management. The farmers also decided to establish Seed Hut in their own communities. Those farmers, who have in the meantime shifted out of tobacco, enrolled their names as Nayakrishi farmers.

2.a.ii Nayakrishi Learning Session

AS an Institutional support, Nayakrishi Learning Sessions were organized at the center level followed after the village survey, village level meeting, selection of farmers and crops.

Objectives of the learning Session:

The process of tobacco production is such that it damages the whole spectrum of environment including water, soil, biological diversity etc. To shift out of tobacco production is a prelude to pursuance of biodiversity based ecological agriculture. The cultivation of food and other crops in conventional practice with pesticides, chemical fertilizer, herbicides and such other inputs having harmful influence on biodiversity and environment is same as that of tobacco cultivation. So shifting out of tobacco should be so oriented as to save biodiversity and increase food production. With this objective in view training session for Nayakrishi was organized.

Participants:

Those farmers who expressed their interest to shift out of tobacco and grow food crops were finally selected for participation in the program. The selected farmers were offered training in Nayakrishi. The farmers who initially consented to shift out of tobacco but did not participate in the training, they were not included in the program. Since the prime importance of the program was to raise food crops in the rabi (winter) season, the training program was also organized in the beginning of the rabi season.
Table 13: Training programmes held during 2009 – 2010 in three research sites

<table>
<thead>
<tr>
<th>DISTRICT</th>
<th>VENUE</th>
<th>PERIOD</th>
<th>PARTICIPANTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Women</td>
</tr>
<tr>
<td>Kushtia</td>
<td>Akhra bari</td>
<td>6-8 Nov 2009</td>
<td>11</td>
</tr>
<tr>
<td>Kushtia</td>
<td>Akhrabari</td>
<td>10-12 Nov 2009</td>
<td>15</td>
</tr>
<tr>
<td>Kushtia</td>
<td>Nazibpur</td>
<td>1-3 Nov 2010</td>
<td>07</td>
</tr>
<tr>
<td>Kushtia</td>
<td>Tilkandra</td>
<td>5-7 Nov 2010</td>
<td>-</td>
</tr>
<tr>
<td>Coxs Bazar</td>
<td>Padmabati Biddaghar</td>
<td>15-17 Nov 2009</td>
<td>8</td>
</tr>
<tr>
<td>Coxs Bazar</td>
<td>Padmabati Biddaghar</td>
<td>21 Nov 23 2009</td>
<td>11</td>
</tr>
<tr>
<td>Coxs Bazar</td>
<td>Padmabati Biddaghar</td>
<td>5-7 Dec 2009</td>
<td>10</td>
</tr>
<tr>
<td>Coxs Bazar</td>
<td>Padmabati Biddaghor</td>
<td>24-26 Nov 2010</td>
<td>10</td>
</tr>
<tr>
<td>Bandarban</td>
<td>Padmabati Biddaghor</td>
<td>2-4 Dec 2010</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>29</td>
</tr>
</tbody>
</table>

The training session was organized in a course of three days duration each. The training sessions were conducted by UBINIG workers, UBINIG researchers, leading Nayakrishi farmers, Members of Seed Expert Committee and Representatives of Seed Committee.

Topics for discussion:

1. Perception about Nayakrishi
2. What is Nayakrishi and Why?
3. Adverse impacts of modern agriculture
4. Public health, food shortage, erosion of biological diversity, degradation of soil resources and erosion of plant genetic resources.
5. Farmer led seed system
6. Mixed cropping, intercropping and crop rotation
7. Compost making for organic manure
8. Past management in natural process
9. Natural cycle
10. Identification of plants
11. Research on local varieties of rice
12. Cost and return analysis of crop production
13. Method of compost preparation
14. Local breeds of livestock and poultry birds
15. Visit Nayakrishi fields

The discussions were held in groups or practically in the fields. The ten principles of Nayakrishi were discussed and analyzed with the help of posters and Flip charts. The adverse impacts of tobacco were presented with reference of different books and publications.

The farmers shared their experience of crop production, impacts of tobacco production and their perception about varieties of local crops and potentials for
shifting out of tobacco. They also shared their previous experience of Nayakrishi. The field level experiences of crop production without chemical fertilizer and pesticides were also highlighted. The farmers participated in the practical demonstration of compost preparation.

**Results:**

The farmers started field experiment after attending the training sessions. The farmers received basic idea about ten principles of Nayakrishi with prime focus on the following:

1. Not to use chemical fertilizer and pesticides
2. The use of the seeds of local varieties
3. Crop production in mixed culture
4. Do not use underground water for irrigation
5. Calculate the cost and return of crop production

Following the examples of the food and other crop producing farmers, the neighboring tobacco farmers have also been encouraged for growing food crops.

### 2. b. i Seed distribution for Transition and Substitution crops

The main demand of the farmers was to get seed support. This is because the tobacco companies have been offering all sort of supports to the farmers only for growing tobacco. In the process of growing tobacco over many farmers lost their collection of seeds as they were noty growing food crops anymore. Tobacco cultivation was seen as easy because seeds and inputs were easily available. But despite such supports by the tobacco companies, the farmers who have decided to give up tobacco production as real losers and victims of tobacco aggression, they wanted to shift. The farmers loss of seeds of winter crops by remaining involved in tobacco cultivation for long time was seen as a misfortune and made farmers dependent on the companies. Once farmers decided to move out of tobacco farming they have been demanding the seed support from the beginning of the program.

The seed support was provided from Nayakrishi Seed Network (NSN), Nayakrishi farmers and from the local source. The seed/ crop selection activity was accomplished with application of SAS.

The farmers decided the following principles before offering the seed support:

- Nayakrishi principles will be pursued for crop production
- Monoculture will be discouraged
- The farmers will contribute a portion of seed requirement from our source
- The farmers will return the same amount received as support.

In the direct field experiments with the farmers, it was clear that the activities had to be started immediately after tobacco is harvested. Those who do not want to grow tobacco in the next season, they had to be involved immediately in the programme. The tobacco farmers grow aus rice or keep the land fallow after the harvest of tobacco. The aus rice is harvested during mid August to mid October and the land is released for tobacco production again. But most of the farmers keep the land fallow and go for
tobacco production in time. They do not grow any crop that overlap the time of tobacco transplanting. Most of the tobacco companies encourage the farmers to grow dhaincha (Sesbania) as a green manure just after the harvest of tobacco deceiving the farmers tobacco companies help grow dhaicha for soil improvement. But the main purpose of the company is to hold the land under their control for growing tobacco. On the other hand, the same land may be used for growing aus rice in kharif - 1 season and amon rice in kharif-2 season. Those farmers who have given up tobacco production are following this cropping pattern. After the harvest of amon rice the farmers go for rabi crop cultivation. With a view to availing the proper time of sowing the rabi crop, short maturing rice varieties are preferred in this situation. Such crops are termed in the research as Transition crops.

SAS technique is also used for selection of the transition crop. The crops are selected based on the experience and results of the previous year. The status of Transition crops in different region are presented in the following table.

Substitute or the Original crop?

Cultivation of food crops is the most important accomplishment of the research for shifting out of tobacco. In this context seed is the key factor for production of crops selected by farmers. The tobacco companies offer different types of cooperation. But the farmers interested in shifting out of tobacco do not get any supply of seeds from the agricultural department.

Based on the need of the farmers seeds were collected through the Nayakrishi Seed Network (NSN) and also from the nearby villages where there is no tobacco production. In rabi season the farmers have diversified crops including the major food crops.

Some principles are followed for distribution of seeds among the farmers. These include:

1. Nayakrishi principles must be followed for raising the crop.
2. It will not be grown in monoculture
3. Preferably grown in mixed or intercropping systems.
4. The farmers will return the same amount of seed after the harvest of the crop
5. The farmers will save seed on farm for sowing in the next season
Seed distribution for transition and substitution

Seeds of transition and substitution crops were distributed to the farmers in the three research sites.

### Transition crops (June – September)

#### Table 14: Transition crops in 2009 - 2011

<table>
<thead>
<tr>
<th>UNION</th>
<th>UPAZILA</th>
<th>DISTRICT</th>
<th>NUMBER FARMERS</th>
<th>LAND AREA (DECIMALS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Boroitoli</td>
<td>Chokoria</td>
<td>11</td>
<td>130</td>
</tr>
<tr>
<td>2.</td>
<td>Suraj Manikpur</td>
<td>Chokoria</td>
<td>5</td>
<td>134</td>
</tr>
<tr>
<td>3.</td>
<td>Kakara</td>
<td>Chokoria</td>
<td>3</td>
<td>67</td>
</tr>
<tr>
<td>4.</td>
<td>Bomubilchari</td>
<td>Chokoria</td>
<td>29</td>
<td>354.10</td>
</tr>
<tr>
<td>5.</td>
<td>Gojolia</td>
<td>Lama</td>
<td>21</td>
<td>278</td>
</tr>
<tr>
<td>6.</td>
<td>Choikhong</td>
<td>Alikodom</td>
<td>31</td>
<td>460</td>
</tr>
<tr>
<td>7.</td>
<td>Khalisha kundi</td>
<td>Daulatpur</td>
<td>15</td>
<td>546</td>
</tr>
<tr>
<td>8.</td>
<td>Fulbaria</td>
<td>Mirpur</td>
<td>15</td>
<td>386</td>
</tr>
<tr>
<td>9.</td>
<td>Sadarpur</td>
<td>Mirpur</td>
<td>7</td>
<td>134</td>
</tr>
<tr>
<td>Chatian</td>
<td>Mirpur</td>
<td>Kushtia</td>
<td>14</td>
<td>197</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>141</td>
<td>37.07 (acres)</td>
</tr>
</tbody>
</table>

### Substitute Crop

#### Table 15: Seed distribution for Substitute crop (Nov. – Feb) in Kushtia, 2009 - 2010

<table>
<thead>
<tr>
<th>NO.</th>
<th>VILLAGE</th>
<th>NO. OF FARMERS</th>
<th>LAND COVERAGE</th>
<th>KINDS OF SEEDS</th>
<th>QTY. OF SEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bheramara - Daulatpur</td>
<td>15</td>
<td>137 dec.</td>
<td>Potato, Lentil, Garlic, Wheet</td>
<td>5344 kg., 4 kg., 38 kg., 125 kg.</td>
</tr>
<tr>
<td>2</td>
<td>Najibpur - Daulatpur</td>
<td>16</td>
<td>201 dec.</td>
<td>Paddy, Coriander, French bean</td>
<td>65 kg., 2 kg., 5 kg.</td>
</tr>
<tr>
<td>3</td>
<td>Barabaria - Mirpur</td>
<td>14</td>
<td>671 dec.</td>
<td>Potato, French bean, Felon, Sweet gourd</td>
<td>2065 kg., 600 kg., 240 kg., 5 kg.</td>
</tr>
<tr>
<td>4</td>
<td>Chatian - Mirpur</td>
<td>6</td>
<td>93 dec.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Kachuadaha - Mirpur</td>
<td>12</td>
<td>226 dec.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Table 16: Seed Distribution for Substitute crop: (Nov. – Feb) in Cox’s Bazar, 2009 - 2010

<table>
<thead>
<tr>
<th>NO.</th>
<th>VILLAGE</th>
<th># FARMERS</th>
<th>LAND COVERAGE</th>
<th>KINDS OF SEEDS</th>
<th>QTY. OF SEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Maizkakara - Chokoria</td>
<td>4</td>
<td>2 acre</td>
<td>Potato</td>
<td>2065 kg.</td>
</tr>
<tr>
<td>2</td>
<td>Manikpur - Chokoria</td>
<td>4</td>
<td>1.05 acre</td>
<td>French bean</td>
<td>600 kg.</td>
</tr>
<tr>
<td>3</td>
<td>Maizpara - Chokoria</td>
<td>12</td>
<td>3.0 acre</td>
<td>Felon, Sweet gourd</td>
<td>240 kg., 5 kg.</td>
</tr>
<tr>
<td>4</td>
<td>Bohaddarkata - Chokoria</td>
<td>6</td>
<td>2.20 acre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Pannissarbeel - Chokoria</td>
<td>12</td>
<td>2.80 acre</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 17: Seed distribution for Substitute crop: (Nov. – Feb) in Bandarban, 2009 - 2010

<table>
<thead>
<tr>
<th>NO.</th>
<th>VILLAGE</th>
<th>NO. OF FARMERS</th>
<th>LAND COVERAGE</th>
<th>SPECIES OF SEEDS</th>
<th>QUNTY. OF SEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sabekbeelchori - Lama</td>
<td>4</td>
<td>1.65 acre</td>
<td>Potato</td>
<td>2400kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>French bean</td>
<td>400kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Felon</td>
<td>160kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sweet gourd</td>
<td>2kg</td>
</tr>
<tr>
<td>2.</td>
<td>Sapmarajhiri - Lama</td>
<td>9</td>
<td>2.5 acre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Dardari - Lama</td>
<td>9</td>
<td>1.80 acre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Nayapara - Alikadom</td>
<td>9</td>
<td>2.13 acre</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 18: Seed distribution for substitute crop, 2010 - 11 in Kushtia

<table>
<thead>
<tr>
<th>VILLAGE</th>
<th>NUMBER OF FARMERS</th>
<th>LAND AREA (DECIMALS)</th>
<th>TYPE OF SEED</th>
<th>QUANTITY OF SEED (KG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tilkandra, Mirpur</td>
<td>25</td>
<td>10.00</td>
<td>Potato</td>
<td>6148</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>wheat</td>
<td>792</td>
</tr>
<tr>
<td>2. Barogangdia, Mirpur</td>
<td>22</td>
<td>16.41</td>
<td>Lentil</td>
<td>102</td>
</tr>
<tr>
<td>3. Protapburg, Daulatpur</td>
<td>15</td>
<td>9.87</td>
<td>Garlic</td>
<td>152</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mustard</td>
<td>07</td>
</tr>
<tr>
<td>Najibpur, Daulatpur</td>
<td>26</td>
<td>15.00</td>
<td>Coriander</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>88</td>
<td>50.28</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 19: Seed distribution for Substitute Crop, November 2010 - February 2011, Cox’sbazar

<table>
<thead>
<tr>
<th>VILLAGE</th>
<th>NUMBER OF FARMERS</th>
<th>LAND AREA (DECIMALS)</th>
<th>TYPE OF SEED</th>
<th>QUANTITY OF SEED (KG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Khoinatipara Maizpara Chokoria</td>
<td>18</td>
<td>370</td>
<td>Potato</td>
<td>7039</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>French bean</td>
<td>295</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Felon</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sweet gourd</td>
<td>07</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Chili</td>
<td>6000</td>
</tr>
<tr>
<td>2. Maiz Kakara, Ultalotoni Chokoria</td>
<td>20</td>
<td>520</td>
<td>Potato</td>
<td>4921</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>French bean</td>
<td>520</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Felon</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sweet gourd</td>
<td>1700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Chili</td>
<td>03</td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>29.10 (acre)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 20: Seed distribution for substitute crop, 2010-11 Bandarban

<table>
<thead>
<tr>
<th>VILLAGE</th>
<th>NUMBER OF FARMERS</th>
<th>LAND AREA (DECIMALS)</th>
<th>TYPE OF SEED</th>
<th>QUANTITY OF SEED (KG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ridoy Mastcrpara Anglapara Lama</td>
<td>11</td>
<td>340</td>
<td>Potato</td>
<td>4921</td>
</tr>
<tr>
<td>Sapmarajhiri Lama</td>
<td>16</td>
<td>420</td>
<td>French bean</td>
<td>520</td>
</tr>
<tr>
<td>Ishaque Karbari para Marma para Ali Kadam</td>
<td>26</td>
<td>1090</td>
<td>Felon</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Chili</td>
<td>1700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sweet gourd</td>
<td>03</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>18.50 (acre)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.c. Document the cost and institutional arrangements needed to sustain diverse local systems

Tobacco has been cultivated in Bangladesh for more than three decades. Initially it was cultivated in limited areas but it has been extended in large areas with time. Previously tobacco was cultivated side by side with other crops in the rabi season including food crops. Within 5-7 years of introduction of tobacco, the acreage and production of food crops started declining. The trend is such that at present the production of vegetables has become negligible. The diversity of crops has been reduced with the introduction of tobacco. Only rice and some
vegetables are grown in the kharif season. This is because the farmers do not have any seed in their hand. The farmers have lost the habit of maintaining seeds. In case of urgent need the farmers buy seed from the market. These are mainly the seeds of High yielding varieties (HYV) and hybrids.

In this situation, a holistic approach is needed to invigorate the base of crop variability and diversity.

A self sustaining seed system needs to be initiated so that the farmers are capable of producing their seeds. With this end is view, greater engravins has been given far seed management in the second phase of research.

Programs were taken up for seed production and management in collaboration with Nayakrishi Andolon and Nayakrishi Seed Network. The main seed related activities included collection, conservation, evaluation and documentation of indigenous varieties of crops and maintenance of seeds of farm.

The major research included the following:

i. Location based crop calendar
ii. Crops grown prior to the introduction of tobacco
iii. List of crops so far eroded after the interdiction of tobacco
iv. Crops still grown side by side with tobacco
v. Activities of Seed Hut and Seed Akhra in the tobacco growing areas
vi. Activities of the community seed wealth Center (CSWC)

vii. Activities of the Nayakrishi Seed Network
viii. Information of the tobacco companies operation in the locality
ix. Back round of the introduction of The High Yielding varieties and hybrids
x. Activities of The Department of Agriculture Extension
xi. Activities of The NGOs actively working with seed in the region
xii. Information about the seed companies along with the source of their seed, clients and such other information

In addition, SAS exercise was carried out to identify the varieties suitable for re-introduction and cultivation.
FINDINGS

In the two years, a crop was developed with the information of food crops grown before introduction of tobacco, food crops lost due to tobacco and what kind of limited crops are grown along with tobacco.

Cox’sbazar and Kushtia

1. Documentation of seed collection, preservation and regeneration in the three areas was done.
2. Farmers own system of seed exchange among themselves
3. Feasibility of establishment of Seed Hut through village meetings, formation of committees etc.
4. Cost analysis of organizing a seed system through NSN

Findings

Women in the tobacco farming families grow vegetables in their homestead land, but their ways of seed preservation were not environment friendly because of use of polythene, plastic pots etc. It was found that there are no potters in the village where they could get earthen pots which are necessary for seed preservation.

The glass bottles used for keeping seeds are mostly from the empty insecticide bottles, usually with dark colour. These are not helpful for seed preservation and sometimes could be harmful because it had smells of insecticides.

Women reported that despite their knowledge on seed preservation, they could not use it properly and cannot train the next generation for seed preservation. Moreover, they do not get support from the male members of the family for seed preservation as they are more market dependent.

Since the agricultural crop growing system is disrupted, the culture related to different crops round the year, has eroded. For example, the culture consuming Binni rice during winter, and making pithas after new rice harvest is lost because of lack of rice varieties.

2.d. Documentation of Matamuhuri river belt being aggressively affected by tobacco

For Bandarban and Chakaria (Cox’sbazar), the tobacco cultivation was based on the aggressive control of the fertile banks Matamuhuri river. These were the land that people used for growing diverse food crops during the whole year. The Matamuhuri river is also very important for fish resources. However, excessive use of pesticides is polluting the river water and killing fish and poisoning the aquatic resources. Matamuhuri is also used by tobacco companies for easy transportation of the logged trees of the hills. This situation is documented in the research. (Appendix 6)

2.e. Documentation of company tactics

The company tactics included how they involve the farmers through the Company Card system and their marketing practice. This is enclosed in the (Appendix 7)
3. TRAINING MODELS AND DECISION-MAKING AIDS

Specific Objective 3: Appropriate training and decision-making aids for farmers

Various strategies to attract people and communicative tools are used in Nayakrishi Farmers’ meetings. Among these the songs and dramas are very popular. For the tobacco farmers it was very important to bring the messages to the people for support to the efforts of small group of farmers who wanted to shift because of environmental and health risks and also because of the loss of essential food crops. They needed support. Thus several strategies were adopted.

3.a. Create and test communication tools

The communication tools such as songs, theatrical skits, demonstration plots of shifting to food crops on the land adjacent to highways from Chittagong to Cox’s bazar and in Kushtia on visible lands on the roadsides towards Mirpur and Daulatpur were done. Several bill boards were placed in the villages and in visible places for the general public. In Kushtia, Aminul Islam Gain composed 4 songs on tobacco and its harmful effects. The Nayakrishi farmers have 530 songs on various aspects of biodiversity-based farming.

Training materials were prepared with information on tobacco and its harmful effects. Specific Nayakrishi principles were developed to suit the needs of the tobacco farmers for transition.

3.b. Publishing of poster, leaflet, booklet

A booklet (in Bangla) was published with pictures and information on the effects of tobacco and possibilities of shifting to food crops. Posters were made on the shifting to food crops that were used by farmers at the village level. Farmers used the songs, and the booklet was used by both the farmers as well the policy makers at the local level.

3.c. Create videos, structured presentations and visual aids

The video documentation and photographs were taken extensively and several PowerPoint presentations have been made for awareness raising programmes.

Leaflets were produced, posters published and bill boards have been made. The billboards were used in newer areas such as Chalan beel, Ishwardi, Natore, Kushtia, and Bandarban. Bill boards were also set up in the field experiment villages, particularly where farmers decided to free the land from tobacco cultivation.

Farmers growing combination food crops have erected sign boards on their fields to demonstrate the crop combination.

Signboards with message of mixed crop as a way of increasing soil fertility were erected in different areas of research sites as opposed to deceptive bill boards of Dhaincha by the tobacco companies.

A book with photographs has been published which explains all the activities of the research.

Videos on tobacco cultivation, on shifting to food crops, dissemination activities
and on workshops were made on tobacco cultivation, shifting to food crops and dissemination works.

3.d. Dissemination of results and preparation of materials

For the dissemination of results, many presentations were made and articles were written in the national and local newspapers on the impact of tobacco cultivation on food production. These were done at the local level and at national level.

3.e. Testing of training materials

The Nayakrishi 10 rules were reformulated for addressing the particular situation of tobacco farmers to shift to food crops. The ten rules were tested with farmers in all the three research areas and modified after receiving the feedback from the farmers and UBINIG researchers. Since tobacco cultivation requires frequent and multiple uses of pesticides, the new ten rules provided a list of the pesticides used and their harmful effects.

Accordingly, the finally Nayakrishi ten rules for tobacco farmers was formally adopted as a training material for the Learning sessions.

Eight pilot training programmes with interested farmers for shifting to food production were organized with the new ten rules. In every training session, there were 20 farmers. The booklet on the harmful effects of tobacco was used as a resource material. This has resulted in clarifying the technical aspects of shifting out of tobacco.
4. RESEARCH ON HEALTH IMPACTS

Specific Objective 4: Document and assess the impacts of tobacco farming on the health of men, women and children in farming households and among agricultural workers

In the first phase of the research, health related aspects could not be directly addressed as the research was mainly focussed on identifying the constraints and strategies for shifting out of tobacco to food crops production. In the first phase of the research (2006 – 2008) many indications of the health problems were found which were associated with tobacco farming particularly in relation to pesticide exposure in tobacco fields and smoke inhalation during curing and sorting of the cured leaves. Health complaints such as respiratory problems, skin ailments, persistent headaches, back pain and women’s reproductive health problems were reported in almost every meeting with the farmers. But the project was unable to collect sufficient data to confirm the health problems as related to tobacco farming. In the phase II (2009 – 2011), health issues were dealt specifically with a specific objective of the research and to conduct an epidemiological research on health effects of tobacco production. However, the research on health did not follow the Epidemiological research methods in a complete way. It was a participatory research with farmers and involvement of health researchers and a medical doctor to analyse the findings. The farmers themselves participated in the research through observation of tobacco farming families on a regular basis and by exercising SAS tools.

4.a. Collection and Review of existing literature

Although much literature on health hazards are found on the health impact of smoking, there are very few literature available at the national level which has information on health hazards related to tobacco cultivation. No research has focussed on tobacco farming and the impact on health. The search for literature on health impact of tobacco showed information of other countries such Vietnam, Pakistan, Brazil and some from the World Health Organisation. A partial list of some literatures are given in (Appendix 8). The exposure of occupational health hazards of the wage labours is also mentioned in some reports.

The health hazards suffered by tobacco farmers usually do not get much attention. Green tobacco sickness (GTS) is caused by the dermal absorption of nicotine from wet tobacco leaves during tobacco cultivation. This results in symptoms including difficulty breathing, nausea, vomiting, headaches, weakness, abdominal cramps and heart rate fluctuations in. Although dermal contact can be avoided by wearing protective clothing or gloves, the poor normally cannot afford this extra equipment [Nicotine & Tobacco Research, 2003; Archives of Environmental Health, 1995] In countries such as Pakistan and India, GTS is a major health concern.

Application of pesticides is essential for tobacco cultivation. Farmers often use aldicarb, chlorpyrifoes, and 1, 3 dichloropropene. Aldicarb use correlates with an increasing number of genetic mutations. Chlorpyrifoes, an organophosphate compound, can cause pesticide poisoning with symptoms of CNS damage and convulsions. Dichloropropene cause respiratory problems with eye irritation, skin irritation and renal damage. In addition to these specific problems, there is an increasing incidence of depression and suicide amongst the tobacco farmers of Brazil.
These neuro-psychiatric effects are thought to be due to the organophosphates used in tobacco farming [Toxicological Sciences, 2003; Occupational and Environmental Medicine, 2002]

4.b.i Study Design:

The health study was conducted in three ways:

1. Observation of tobacco farming families including wage workers for two years (June 2009-May 2010 and June 2010 - May 2011) for reported illness
2. SAS Exercise of Impact and Incidence: Rainbow
3. Longitudinal Cohort Study.

Study Site

- Chakaria (Cox’sbazar) & Lama (Bandarban): (40 families from 2 villages of Chokoria & 2 villages of Lama).
- Mirpur and Daulotpur upazilla (Kushtia) (40 families from 3 villages are selected)
- Sample Size: Total 100 families are being sampled for this study (50 sample + 50 Control)

The Sample

Table 21: Sample size for Chakaria & Lama community 30 families and Mirpur and Daulatpur are 20 families.

<table>
<thead>
<tr>
<th>AREAS</th>
<th>DIRECT TOBACCO FARMING FAMILIES</th>
<th>SHIFTED TOBACCO FARMING FAMILIES</th>
<th>TOBACCO DAY LABOURERS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chakaria &amp; Lama community</td>
<td>20</td>
<td>05</td>
<td>05</td>
<td>30</td>
</tr>
<tr>
<td>Mirpur and Daulotpur</td>
<td>12</td>
<td>04</td>
<td>04</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>9</td>
<td>9</td>
<td>50</td>
</tr>
</tbody>
</table>

The Control Sample

Table 22: Sample size for Chakaria & Lama community: 30 families (Non-tobacco farmers)

<table>
<thead>
<tr>
<th>AREAS</th>
<th>MODERN AGRICULTURE</th>
<th>AGRICULTURAL DAY LABOURERS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chakaria &amp; Lama community</td>
<td>22</td>
<td>8</td>
<td>30</td>
</tr>
<tr>
<td>Mirpur and Daulotpur</td>
<td>16</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>12</td>
<td>50</td>
</tr>
</tbody>
</table>
4.c General description of the study sample

The health study was conducted in Chakaria, Lama and Mirpur and Daulotpur upazillas, three of the leading tobacco farming areas in Bangladesh. Various people in the tobacco growing villages were interviewed, including tobacco farmers, labourers as well as farmers who are growing food crops.

4.c.i Chakaria & Lama: Cox’sbazar and Bandarban

Twenty tobacco farming families, 05 shifted tobacco farming families & 05 tobacco day labourers were purposively selected and had interactions through observations and group discussions over a period of time. To identify and classify the health issues related to tobacco farming in terms of impact and incidence, SAS2 tool was applied by the field research team.

Similarly, in order to compare the results, a control group of non-tobacco farmers were selected and measured on the same scale. The control group was formed with 20 modern agricultural farmers and 10 agriculture day labourers.

The selected families have given their consent to share experiences for this research and have been registered for future follow up.

4.c.ii Mirpur and Daulatpur: Kushtia

Twelve tobacco farming families, 04 shifted tobacco farming families & 04 tobacco day labourers were purposively selected and interviewed over a period of time (July 2009-june 2010) by using selected questions. To identify and classify the health issues related to tobacco farming in terms of impact and incidence, SAS2 tool was applied.

Similarly, in order to compare the results, a control group of non-tobacco farmers were selected and measured on the same scale. The control group was formed with 12 modern agricultural farmers and 8 agriculture day labourers.

The selected families have given their consent to share their experiences for this research and have been registered for future follow up.

Data collection

The research team prepared a questionnaire for interview on the basis of the objectives of the study.

1. Structured questionnaire was developed and tested before use.
2. Interviews were performed by trained researchers
3. Data collection was supervised by research team.

4.d.i Study Results

The association between tobacco farming and self-reported illness

According to the medical doctor who visited the village and interviewed the farmers, the hazards posed by tobacco cultivation place tobacco farmers and workers at increased risk of injury and illness. Women, children and adults working with tobacco frequently suffer from green tobacco sickness (GTS), which is caused by dermal absorption of nicotine from contact with wet tobacco leaves. Common
symptoms range from nausea, vomiting and weakness to headaches and dizziness, and may also include abdominal cramps and difficulty breathing, as well as fluctuations in blood pressure and heart rates.

Farmers reported to the doctor that large and frequent applications of pesticides are required to protect the plant from insects and disease.

Most of the farmers that the doctor interviewed, mentioned about their daily routine of work in tobacco farming and its relation to their physical ailment. From the day the seedbed is laid to the day the pay cheque is collected, the farmer goes through a vigorous process of intensive physical labour, come in contact with toxic substances and also inhales an assortment of chemicals. To make matters worse, the farmer has no protective gloves, gas masks, gum boots or dust-coats during his work. Thus, at the end of the farming season, the farmer spends most of the money he earned from the crop, to seek medication. Tobacco cultivation plots are situated near water bodies (rivers), most times at the source. The farmers who cannot find the plot near the water source, has to carry water for quite distance to water his tobacco nurseries. This weight bearing jobs then takes its toll on their health by inflicting back injury with high incidence of low back pain.

4.d.ii Occupational Health Hazard Reporting in Different Stages of Tobacco Cultivation: Impact On Wage Workers

The wage workers are hired (male and female) during different times of the tobacco cultivation. In each step the kind of work and the occupational health hazards are felt by the workers which came out in intensive discussions in the focus group meetings. Among them, some unpaid family members are also included.

In the following, a step by step description of works done by wage workers (or family members as unpaid labour) is presented from the description given farmers in Chakoria & Lama.

**Sowing (Seed Bed)**

Tobacco sowing starts in September. The seed bed is produced by elevating the ground. The seeds are then scattered onto the surface of the soil, as their germination is activated by light. Seed bed needs regular watering. Once the leaves starts growing from the seed, the grass and weed are removed by hand. Urea fertilizers mixed in water are then spread over the seed bed. In order to make the seed look healthy certain vitamins in powder form are also applied. Both men and women work on the seedbed.

**Transplanting (Planting)**

After the plants have reached a certain height, they are transplanted into fields. This was originally done by making a relatively large hole in the tilled earth with a tobacco peg, then placing the small plant in the hole. Each hole is then watered regularly to help growing the roots.

**Earthing Up (Ring)**

After 10-15 days of planting, the earthing up is done. Fertilizers are used at the same time as well.

**Taking care of the Plants**

After earthing up, the chemical fertilizers mixed in water are applied. If any plant
dies, that gets replaced by another viable plant. After that pesticides and chemical fertilizers are mixed together and applied. The fertilizers used are Urea, TSP, SP. Both men & women work together on this ground.

**Drainage between two rows (channelling)**

This process requires channelling the earth between two rows and then add water into it. At times, channelling is done twice. Also the bugs are needed to be killed by hand since they can’t be removed by the pesticides.

**Suckering (Breaking the auxiliary buds)**

Once the tobacco plants are growing well, they will begin to produce shoots from the joint of each leaf with the stalk. These secondary shoots — known as "suckers" — are undesirable as they divert energy that could be directed into the leaves. They are removed in a process known as "suckering". Generally this is done by hand several times during the season. A poison Ripkot is used at this stage.

**Breaking the leaves**

The leaves ripen from the ground upwards, so a field of tobacco may go through several "pullings" before the tobacco is entirely harvested. Every time the leaves are taken from the bottom to the top. All the families have to work during this process.

**Sticking**

The leaves are bind together (40 Leaves in one stick) along with a stick (4.5ft) in order to put it in a furnace for curing.

**Curing**

The sticks (350-450 per load) are hanged in the furnace also knows as Kiln for curing. The sticks are kept in the kiln for 60-72 hours and is constantly monitored by someone to keep the temperature stable. When they become brown, the stick are then taken out and they starts to sort the leaves.

**Bailing**

Once cured, all the tobacco leaves are then piled up in a manner so that it can be bundled in compact way. The cured tobacco leaves spreads out a very pungent odour and dust.

**Table 23: Steps in tobacco cultivation with kind of work and health impacts**

<table>
<thead>
<tr>
<th>Steps In Tobacco Cultivation</th>
<th>Kind Of Work Done</th>
<th>Health Impacts Cox’sbazar-Bandarban</th>
<th>Health Impacts Kushia (Daulatpur-Mirpur)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sowing (Seed Bed)</td>
<td>Earth cutting by spade, and beating the soil for levelling</td>
<td>Low back pain, body-ache, headache, burning sensation in the eyes, breathlessness, Nausea, gastric, asthma &amp; pneumonia.</td>
<td>Low back pain, blisters in the hand, Injury to the hand, body-ache, headache, burning sensation in the eyes, breathlessness dizziness, Nausea, bitter taste in mouth, palpitation, weakness, gastric.</td>
</tr>
<tr>
<td>Transplanting (Planting)</td>
<td>Low back pain, body-ache, fever, common cold, cuts &amp; bruises while working on the field.</td>
<td></td>
<td>Low back pain, body-ache, shoulder pain, breathlessness, fever, common cold, cuts &amp; bruises while working on the field.</td>
</tr>
<tr>
<td>Task</td>
<td>Health Problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>----------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Earthing Up (Ring)</strong></td>
<td>Low back pain, headache, red eye, nausea, restlessness, pain in the finger joints.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nausea, palpitation, gastritis, sweating, knee joint pain, low back pain, headache, red eye, nausea, restlessness, pain in the finger joints.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Taking care of plants</strong></td>
<td>Low back pain, body-ache, fever, common cold, burning sensation of the body, breathlessness during the use of chemicals &amp; pesticides, dizziness, vomiting, tummy ache, dribbling of semen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low back pain, body-ache, fever, common cold, burning sensation of the body, breathlessness during the use of chemicals &amp; pesticides, dizziness, vomiting, tummy ache.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Channelling</strong></td>
<td>Body-ache, blistering on the hands, breathlessness due to inhalation of dust, insomnia</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Body-ache, blistering on the hands, breathlessness due to inhalation of dust, sleeplessness.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Shoor Tana</strong></td>
<td>Chest pain, low back pain, body-ache, weakness, dizziness, palpitation, restlessness, breathlessness, loss of appetite.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gastric pain, low back pain, body-ache, weakness, dizziness, palpitation, restlessness, breathlessness, loss of appetite.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suckering, breaking the auxiliary buds</strong></td>
<td>Nausea, dizziness, fever, pneumonia, gastritis, bitter taste in the hand and mouth, diarrhea.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nausea, dizziness, fever, pneumonia, gastritis, bitter taste in mouth, diarrhoea.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Breaking the leaves</strong></td>
<td>Heat stroke, diarrhoea, vomiting, loss of appetite, bitter taste in mouth, hands are filled with leaves stain, gastric, white menstruation among women or leukorrhoea.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diarrhoea, vomiting, loss of appetite, bitter taste in mouth, hands are filled with leaves stain, gastric, white menstruation among women, heat exhaustion.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Carrying the leaves</strong></td>
<td>Headache, back injury due to heavy weight, tiredness, eye burn, dizziness, gastritis, weakness among women</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Back injury due heavy weight, weakness, dizziness, gastritis, burning sensation in eyes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sticking</strong></td>
<td>Vomiting, diarrhoea, pain in the hand, eye burn, loss of appetite.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nausea, vomiting, diarrhoea, pain in the hand, eye burn, loss of appetite.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Curing</strong></td>
<td>Sleeplessness, dizziness, weakness, pneumonia, typhoid, jaundice, excessive sweating, vomiting, ulcers, breathing problems for kids and surroundings, blurring of vision, injuries, burning sensation during micturition, uterine prolapse, loss of appetite, tummy ache, joint pain, headache, lack of libido, asthma, low blood pressure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heat exhaustion, sleeplessness, dizziness, weakness, pneumonia, typhoid, excessive sweating, vomiting, ulcers, breathing problems for kids and surroundings, blurring of vision, injuries, burning sensation during micturition, loss of appetite, tummy ache, joint pain, headache, asthma.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bailing</strong></td>
<td>Nausea, vomiting, intoxication from inhalation, Allergy, Rhinitis</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nausea, vomiting, intoxication from inhalation, Allergy, Rhinitis</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**4.e.i. SAS Exercise on Health: Impact and Incidence (Rainbow)**

**SAS Tool: Rainbow Incidence and Impact: Kushtia**

The Impact and Incidence of health problems due to tobacco cultivation was done...
in mostly First Phase villages such as Sabekbilchari in Bandarban, Dhakhin Manikpur in Chakaria, Cox'sbazar, Chatian and Kachua in Mirpur Upazilla and Bheramara and Chuamallikpara in Daulatpur upazilla of Kushtia.

Purpose: to identify and classify health issues related to tobacco farming in terms of impact and incidence

Village: Chuamallikpara, Daulatpur, Kushtia

Date:

Participants: 14

Three categories of men and women participated in the exercise. These are

- tobacco farmers who cultivate tobacco every year
- those who suffered from same kind of health problems during last season (November, 08 - March 09)
- those who are not involved in tobacco farming

Step 1: The participants discussed the issue of tobacco farming. In Chuamallikpara, tobacco farming started 27 years before. According to the different levels of land in the village, farmers grow different crops. In the low land tobacco is grown, in the lower land, rice is cultivated and in high land vegetables are cultivated. In the beginning tobacco farming showed very good return, therefore many farmers became interested within the first 3 years. Seeing the potential of tobacco, the tobacco company approached the farmers to set up more permanent brick built kiln for curing tobacco leaves. The small and medium farmers built brick made kiln by taking loans from the tobacco company.

Gradually the production of food crops such as rice (Aus and Aman) wheat, pulses (masur, khesari), vegetables and sugarcane were reduced. For curing of the tobacco leaves, the farmers started cutting the fruit and timber trees. Now Chuamallikpara looks like a new village with very young trees.

The participants also discussed that they had less diseases before tobacco cultivation, but now they are always having some kind of diseases or suffering from health problems. Women are facing more health problems including reproductive health problems. Women are experiencing miscarriages more than ever.

Step 2: The participants made a list of health problems that were experienced by themselves and have seen others suffer during the previous tobacco season. These are:


The reasons for these health problems were also discussed. The situations under which they felt the problems were:

- when they tie up the leaves on the rope/rod they get coughing, sneezing, respiratory problems, gas, vomiting and also loss appetite.
- when women sit for 40 to 72 hours in front of the kiln to keep on giving firewood's into the 'chula', they feel backaches, pain in the joints, cannot get up quickly, feel burning sensation in hands and if a pregnant woman does
such works, she experiences miscarriage.

- when the leaves are taken out of the kiln and kept for cooling, they get cold, fever, sneezing, cough and watered eyes.
- During the curing time, they do not drink enough water, so they get reddish urine.

Step 3: The 24 cards were regrouped into 16 cards, which mean similar things or are alike. These are 1. headache, 2. sleeplessness, 3. cough, 4. stomach ache, 5. asthma, 6. burning feelings, 7. vomiting, 8. no appetite, 9. fever, 10. heart problem, 11. gas 12. cancer, 13. backache, 14. eye problem, 15. weakness, and TB

Step 4: The cards were placed in the Rainbow according to their impacts as low, moderate and high.

Step 5: The cards were placed with incidence on the three sides of the rainbow according to the incidence of the health problems.

RESULT:

Low Incidence - Low impact: none
Low Incidence - Moderate Impact: cough
Low incidence - High Impact: headache, sleeplessness
Moderate Incidence - Low impact: fever
Moderate Incidence - Moderate impact: vomiting, loss of appetite and TB
Moderate Incidence - High Impact: stomach ache, asthma, burning sensation and weakness
High Incidence - Low impact: none
High incidence - moderate impact: backache, eye sight problem

ANALYSIS: Out of 16 grouped diseases 5 diseases were in the category of High incidence with high and moderate impact. The high impact means particularly on their ability to work and in terms of costs of treatment. Seven diseases were listed as having moderate incidence but with high and moderate impact.

Taking these two groups together 12 out of 16 diseases have high and moderate impact on the health of the farmers and their families.

It seems that the farmers did not find much health problems which have less impact and also have less incidence.
SAS tool: Rainbow Incidence and Impact Kushtia

Village: Kachuadaha, Kushtia
Date: 4 August, 2009
Participants: 13 (including 7 women and 6 men)

Three categories of men and women participated in the exercise. These are

- tobacco farmers who cultivate tobacco every year. Some of them hold company card.
- those who suffered from some kind of health problems during last season (November, 08 - March 09)
- those who are not involved in tobacco farming. Two farmers have already shifted out of tobacco.

Step 1: The participants discussed the issue of tobacco farming. In Kachuadaha, tobacco farming started 21 years before. The profit from tobacco cultivation attracted most farmers and cultivation of Rabi (winter crops) were reduced. Therefore the consumption of food crops were also reduced. The food is less nutritious than before. Women are more involved in providing labour in tobacco curing upto marketing. So they are suffering from different diseases.

Step 2: The participants made a list of health problems on cards that were experienced by themselves and have seen others suffer during the previous tobacco season. These are: 1. gas formation, 2. sneezing-cough, 3. Allergy, 4. stroke, 5. fever, 6. gastric, 7. swollen legs and joints, 8. vomiting, 9. vomiting tendency, 9. sleeplessness, 10. respiratory problem, 11. cancer, 12. lower abdomen pain, 13. burning sensation in hands and feet and neck, 14. stiff neck, 15. backache, 16. hand and leg pain, 17. jaundice, 18. waist pain and leg pain, 19. kidney problem, 20. miscarriage, 21. bone problems

The reasons for these health problems were also discussed. The situations under which they felt the problems were:

- when women sit for 36 to 72 hours in front of the kiln to keep on giving firewoods into the ‘chula’, they feel backaches, pain in the joints, cannot get up quickly, feel burning sensation in hands, stiff neck, neck pain pressure
- when the leaves are graded then they feel sneezing, gas, allergy.
- when the leaves are taken out of the kiln and kept for cooling, they get cold and fever,
- During the curing time, they do not drink enough water, so the body becomes dry and even have jaundice

Step 3: The 20 cards could not be regrouped as they discussed that the symptoms were very different even though they looked like same disease or health problems.

Step 4: The cards were placed in the Rainbow according to their impacts as low, moderate and high.

Step 5: The cards were placed with incidence on the three sides of the rainbow according to the incidence of the health problems.
RESULT:

Low Incidence - Low impact: lower abdomen pain, stroke

Low Incidence - Moderate Impact: jaundice, kidney problem, headache, miscarriage

Low incidence - High Impact: cancer

Moderate Incidence - Low impact: Allergy

Moderate Incidence - Moderate impact: bone problems, hand and leg pain

Moderate Incidence - High Impact: waist pain, pain in joints

High Incidence - Low impact: fever

High incidence - moderate impact: body dryness, hand and leg burning

High incidence - High impact: respiratory problem, sleeplessness, leg pain, vomiting tendency, gas, sneezing, cough

ANALYSIS: Out of 20 diseases 6 diseases were in the category of High incidence with high impact. The high impact means particularly on their ability to work and in terms of costs of treatment. Three diseases were listed as having moderate incidence but with high impact. That is 9 out of 20 diseases have high incidence and high impact, while another 6 diseases have moderate incidence and moderate impact. Taking these two groups together 15 out of 20 diseases have high and moderate impact on the health of the farmers and their families.

SAS Tool: Rainbow Incidence and Impact Bandarban

Purpose: to identify and classify health issues related to tobacco farming in terms of impact and incidence

Village: Sabek bilchari, Lama, Bandarban

Date: 16 August, 2009

Participants: 13 (2 women, 11 men)

Three categories of men and women participated in the exercise. These are

i. tobacco farmers who cultivate tobacco every year

ii. those who suffered from some kind of health problems during last season (November, 08 - March 09)

iii. those who are not involved in tobacco farming

Step 1: The participants discussed the issue of tobacco farming. In Sabek bilchari they discussed about the kind of health problems faced by people due to tobacco.

Tobacco farming has caused environmental and the hilly area has become nude. There are no trees. However, in this village they have taken initiative to grow food rather than tobacco by few farmers by joining Nayakrishi.

Step 2: The participants were given three cards to write down three
diseases/health problems that they faced or have seen others face during the previous tobacco season. The list of health problems that were experienced by themselves and have seen others suffer during the previous tobacco season included 1. headache, 2. high pressure, 3. asthma, 4. diarrhoea, 5. gastric, 6. cough, 7. tuberculosis, 8. virus fever, 9. jaundice, 10. ulcer, 11. typhoid, 12. malaria, 13. respiratory problem.

The reasons and the situations in which they faced the health problems were also discussed. The situations under which they felt the problems were:

i. from the beginning till the curing of tobacco leaves, they have headache.
ii. there is pain in the neck on the left side, and feel tensed.
iii. Inhale the gas from the tobacco leaves then get cough and respiration problem.
iv. feel lack of appetite, fever.

Step 3: The 13 cards were regrouped into 8 cards, which mean similar things or are alike. These are 1. TB, 2. diarrhoea, 3. malaria, 4. asthma, 5. high pressure, 6. headache, 7. gastric and 8. jaundice. The participant also made some drawing to show the diseases or health problems.

Step 4: The cards were placed in the Rainbow according to their impacts as low, moderate and high.

Step 5: The cards were placed with incidence on the three sides of the rainbow according to the incidence of the health problems.

RESULT:

- Low Incidence - Low impact: none
- Low Incidence - Moderate Impact: TB, High pressure
- Low incidence - High Impact: none
- Moderate Incidence - Low impact: Asthma
- Moderate Incidence - Moderate impact: none
- Moderate Incidence - High Impact: Malaria
- High Incidence - Low impact: none
- High incidence - moderate impact: none
- High incidence - High impact: gastric, headache

ANALYSIS: Out of 8 grouped diseases 3 diseases were in the category of High/moderate incidence with high impact. The high impact means particularly on their ability to work and in terms of costs of treatment. Two diseases were listed as having low incidence with moderate impact. These two are very serious problem and even if it has low incidence the impact is moderate, which affects on their lives.

Asthma seems to be common and is seen as low impact.
4.f. Document and assess Occupational health hazards

The project conducted an investigation into the occurrence of respiratory ailments and problems associated with exposure to pesticides among the family members of tobacco farmers and wage workers and compare these occurrences with conventional farmers and wage workers. Ten tobacco farming families in each of the 6 research villages in Kushtia were observed every week of the months over a period of 72 weeks (in the first year project) starting from July 2009 to May 2010. The observation continued in the second year but the information is not complete yet. The ten families included information on head of the family, wife and children and other members of the family. Four villages were observed in each year, with two villages Kachuadaha and Chatian continued for two years, while two new villages were added for the second year. These families were involved in tobacco farming as farmers and as wage workers. The profile of the families is the following:
Table 24: Villages under Disease Monitoring in Kushtia

<table>
<thead>
<tr>
<th>SL</th>
<th>VILLAGE</th>
<th>UNION</th>
<th>UPAZILA</th>
<th>NO. OF FAMILY MEMBERS OBSERVED 2009-10</th>
<th>NO. OF FAMILY MEMBERS OBSERVED 2010-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kachuadaha</td>
<td>Fulbaria</td>
<td>Mirpur</td>
<td>43</td>
<td>33</td>
</tr>
<tr>
<td>2</td>
<td>Chatian</td>
<td>Chatian</td>
<td>Mirpur</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>3</td>
<td>Bheramara</td>
<td>Rifayetpur</td>
<td>Daulatpu</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Chuamallikpara</td>
<td>Daulatpur</td>
<td>Daulatpu</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Barobaria</td>
<td>Sadarpur</td>
<td>Mirpur</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Najibpur</td>
<td>Khalishakundi</td>
<td>Daulatpu</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td></td>
<td>163</td>
<td>149</td>
</tr>
</tbody>
</table>

Table 25: Status to tobacco cultivation in the selected villages: Kushtia

<table>
<thead>
<tr>
<th>SL</th>
<th>VILLAGE</th>
<th>TOBACCO CULTIVATION SINCE</th>
<th>TOTAL CULTIVABLE LAND (ACRE)</th>
<th>TOBACCO (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kachuadaha</td>
<td>1988</td>
<td>257</td>
<td>168</td>
</tr>
<tr>
<td>2</td>
<td>Chatian</td>
<td>1988</td>
<td>1032</td>
<td>827</td>
</tr>
<tr>
<td>3</td>
<td>Bheramara</td>
<td>1988</td>
<td>446</td>
<td>387</td>
</tr>
<tr>
<td>4</td>
<td>Chuamallikpara</td>
<td>1988</td>
<td>356</td>
<td>284</td>
</tr>
<tr>
<td>5</td>
<td>Barobaria</td>
<td>1988</td>
<td>387</td>
<td>233</td>
</tr>
<tr>
<td>6</td>
<td>Najibpur</td>
<td>1989</td>
<td>289</td>
<td>176</td>
</tr>
</tbody>
</table>

The selected villages had at least over three decades of tobacco cultivation at the time of the study.

Table 26: Villages under Disease Monitoring in Cox’sbazar-Bandarban

<table>
<thead>
<tr>
<th>SL</th>
<th>VILLAGE</th>
<th>UNION</th>
<th>UPAZILA</th>
<th>NO. OF FAMILY MEMBERS OBSERVED 2009-10</th>
<th>NO. OF FAMILY MEMBERS OBSERVED 2010-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Maizakakara</td>
<td>Kakara</td>
<td>Chakaria</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Modliyo Manikpur</td>
<td>Surajpur-Manikpur</td>
<td>Chakaria</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Sabek bilchari</td>
<td>Lama Sadar</td>
<td>Lama</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Ibrahim Leaderpara</td>
<td>Ruposhipara</td>
<td>Lama</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Maiz para beesi</td>
<td>Borotoli</td>
<td>Chakaria</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Fanisstiyar beel</td>
<td>Bamu beechari</td>
<td>Chakaria</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Sapmarajhiri</td>
<td>Gazalia</td>
<td>Lama</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Naya para</td>
<td>Chaikhong</td>
<td>Alikadam</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td></td>
<td>262</td>
<td>204</td>
</tr>
</tbody>
</table>
Table 27: Status to tobacco cultivation in the selected villages: Cox’sbazar-Bandarban

<table>
<thead>
<tr>
<th>SL</th>
<th>VILLAGE</th>
<th>TOBACCO CULTIVATION SINCE</th>
<th>TOTAL CULTIVABLE LAND (ACRE)</th>
<th>TOBACCO (ACRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Maiz kakara</td>
<td>1995</td>
<td>215</td>
<td>195</td>
</tr>
<tr>
<td>2</td>
<td>Modhyo Manikpur</td>
<td>1985</td>
<td>352</td>
<td>210</td>
</tr>
<tr>
<td>3</td>
<td>Sabek beelchari</td>
<td>1988</td>
<td>750</td>
<td>620</td>
</tr>
<tr>
<td>4</td>
<td>Ibrahim leader para</td>
<td>1988</td>
<td>425</td>
<td>365</td>
</tr>
<tr>
<td>5</td>
<td>Maizpara</td>
<td>2005</td>
<td>85</td>
<td>40</td>
</tr>
<tr>
<td>6</td>
<td>Panissiarybeel</td>
<td>1988</td>
<td>610</td>
<td>265</td>
</tr>
<tr>
<td>7</td>
<td>Sapmarajhiri</td>
<td>1990</td>
<td>188</td>
<td>47</td>
</tr>
<tr>
<td>8</td>
<td>Naya para</td>
<td>1986</td>
<td>276</td>
<td>134</td>
</tr>
</tbody>
</table>

In Chakaria and Bandarban, except Maizpara (6 years), and Shapmarajhil two decades; most of the villages have an experience of over three decades of tobacco cultivation at the time of the study.

Table 28: Profile of the families observed in Kushtia (2009 – 2011)

<table>
<thead>
<tr>
<th>VILLAGE</th>
<th>FEMALE</th>
<th>MALE</th>
<th>0-5 Boy</th>
<th>6-18 Boy</th>
<th>Girl</th>
<th>Female</th>
<th>Male</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kachuadaha</td>
<td>16</td>
<td>15</td>
<td>2</td>
<td>4</td>
<td></td>
<td>21</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Chatian</td>
<td>11</td>
<td>14</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>16</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Bheramara</td>
<td>15</td>
<td>14</td>
<td>0</td>
<td>6</td>
<td>5</td>
<td>24</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Chuamallikpara</td>
<td>12</td>
<td>12</td>
<td>1</td>
<td>10</td>
<td>4</td>
<td>17</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Baroaria</td>
<td>10</td>
<td>13</td>
<td>3</td>
<td>9</td>
<td>6</td>
<td>17</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Najibpur</td>
<td>11</td>
<td>11</td>
<td>3</td>
<td>8</td>
<td>5</td>
<td>16</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>79</td>
<td>10</td>
<td>43</td>
<td>25</td>
<td>111</td>
<td>132</td>
<td></td>
</tr>
</tbody>
</table>

Table 29: Profile of the families observed in Cox’sbazar-Bandarban (2009 – 2011)

<table>
<thead>
<tr>
<th>VILLAGE</th>
<th>FEMALE</th>
<th>MALE</th>
<th>0-5 Boy</th>
<th>6-18 Boy</th>
<th>Girl</th>
<th>Female</th>
<th>Male</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maiz kakara</td>
<td>12</td>
<td>15</td>
<td>5</td>
<td>23</td>
<td>4</td>
<td>30</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>Modhyo</td>
<td>13</td>
<td>17</td>
<td>2</td>
<td>22</td>
<td>14</td>
<td>27</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Manikpur</td>
<td>13</td>
<td>14</td>
<td>2</td>
<td>11</td>
<td>6</td>
<td>22</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Ibrahim leader</td>
<td>16</td>
<td>14</td>
<td>4</td>
<td>16</td>
<td>18</td>
<td>37</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>para</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.g.i Observe and Interview sample households regarding health conditions

Observation of Tobacco families by field researchers

The health observation was a continuous work throughout the year to capture the information on health during and after the tobacco season. A form was developed for each family in the research villages and was observed once in a week.
FINDINGS:

Health problems of family members was reported during different months. In the following the major problems are shown in the table:

Table 30: KUSHTIA villages (all over the year) Incidences of illnesses

<table>
<thead>
<tr>
<th>DISEASE/ILLNESS</th>
<th>HEAD OF HOUSEHOLD</th>
<th>WIFE</th>
<th>CHILDREN</th>
<th>OTHER FAMILY MEMBERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>36</td>
<td>25</td>
<td>91</td>
<td>30</td>
</tr>
<tr>
<td>Gas</td>
<td>150</td>
<td>150</td>
<td>1</td>
<td>62</td>
</tr>
<tr>
<td>Pain*</td>
<td>111</td>
<td>105</td>
<td>15</td>
<td>24</td>
</tr>
<tr>
<td>Asthma/respiratory</td>
<td>2</td>
<td>16</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Stomach ailments</td>
<td>9</td>
<td>23</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>Heart Stroke</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* Pain include back pain, leg and body pain

Table 31: Cox’sbazar-Bandarban villages (all over the year) Incidences of illnesses

<table>
<thead>
<tr>
<th>DISEASE/ILLNESS</th>
<th>HEAD OF HOUSEHOLD</th>
<th>WIFE</th>
<th>CHILDREN</th>
<th>OTHER FAMILY MEMBERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>99</td>
<td>72</td>
<td>152</td>
<td>53</td>
</tr>
<tr>
<td>Gas</td>
<td>26</td>
<td>130</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Pain*</td>
<td>10</td>
<td>148</td>
<td>39</td>
<td>41</td>
</tr>
<tr>
<td>Asthma</td>
<td>16</td>
<td>1</td>
<td>9</td>
<td>25</td>
</tr>
<tr>
<td>Stomach ailments</td>
<td>4</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Heart Stroke</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
* Pain include back pain, leg and body pain

If we look at the illnesses in different periods such as July to September as pre-Tobacco cultivation phase, October to April as during tobacco cultivation phase and May to June as post-cultivation phase, then the reported illnesses show the differences very clearly. It may be mentioned as during these period, head of the households and their wives are more related to the work, the following charts show head of the households and wives diseases taken together.
In both areas, all the major health problems are happening during the tobacco cultivation time, i.e. during October to April. In Kushtia, the incidence of gas is higher during tobacco season, while in Lama-Chakaria the pain is more. This is because of the hilly area and difficulties of work during the season to bring water, earth cutting etc. For children also the incidence of fever is highest during tobacco cultivation period.

**Comparison of illnesses by Doctor**

Self-reported illness of the study populations was measured on the basis of the farmer’s own SAS exercise. The association between tobacco farming and illness in the following table implies to the findings that have been reported and periodically monitored. The following is the Doctor’s comparative observation on diseases for tobacco and non-tobacco farmers.

**Table 32: Self Reported Illness at Chakoria & Lama**

<table>
<thead>
<tr>
<th>SYMPTOMS (HIGH INCIDENCE + HIGH IMPACT)</th>
<th>TOBACCO FARMERS</th>
<th>NON-TOBACCO FARMERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weakness</td>
<td>++++</td>
<td>++</td>
</tr>
<tr>
<td>Headache</td>
<td>++++</td>
<td>++</td>
</tr>
<tr>
<td>Nausea</td>
<td>++++</td>
<td>+</td>
</tr>
<tr>
<td>Vomiting</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>Vertigo</td>
<td>++++</td>
<td>-</td>
</tr>
<tr>
<td>Gastric</td>
<td>++++</td>
<td>++</td>
</tr>
<tr>
<td>Asthma</td>
<td>++</td>
<td>-</td>
</tr>
<tr>
<td>Breathlessness</td>
<td>++</td>
<td>-</td>
</tr>
<tr>
<td>Back pain</td>
<td>++++</td>
<td>+</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>Blurred vision</td>
<td>+++</td>
<td>-</td>
</tr>
<tr>
<td>Injury to the hand</td>
<td>++++</td>
<td>-</td>
</tr>
<tr>
<td>Loss of appetite</td>
<td>+++</td>
<td>-</td>
</tr>
<tr>
<td>Hypertension</td>
<td>++</td>
<td>-</td>
</tr>
<tr>
<td>Jaundice</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Malaria</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

++++ High Compliance

+++ Moderate Compliance
++ Low Compliance
+ Little or No Compliance
- Not reported at all

Table 33: Self Reported Illness at Mirpur and Daulotpur

<table>
<thead>
<tr>
<th>SYMPTOMS (HIGH INCIDENCE + HIGH IMPACT)</th>
<th>TOBACCO FARMERS</th>
<th>NON-TOBACCO FARMERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weakness</td>
<td>++++</td>
<td>-</td>
</tr>
<tr>
<td>Headache</td>
<td>++++</td>
<td>+</td>
</tr>
<tr>
<td>Nausea</td>
<td>+++</td>
<td>-</td>
</tr>
<tr>
<td>Vomiting</td>
<td>++++</td>
<td>-</td>
</tr>
<tr>
<td>Vertigo</td>
<td>++++</td>
<td>+</td>
</tr>
<tr>
<td>Gastric</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>Asthma</td>
<td>++++</td>
<td>-</td>
</tr>
<tr>
<td>Breathlessness</td>
<td>++++</td>
<td>+</td>
</tr>
<tr>
<td>Back pain</td>
<td>++++</td>
<td>+++</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>++++</td>
<td>+</td>
</tr>
<tr>
<td>Blurred vision</td>
<td>+++</td>
<td>-</td>
</tr>
<tr>
<td>Injury to the hand</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Loss of appetite</td>
<td>++</td>
<td>-</td>
</tr>
<tr>
<td>Hypertension</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Jaundice</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Malaria</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

+++ High Compliance
++ Low Compliance
+ Little or No Compliance
- Not reported at all

It is clear from the above list that the tobacco farmers have high compliance of the same diseases for tobacco and non-tobacco farmers and there are many diseases which are there mainly for the tobacco farmers and not non-tobacco farmers. So tobacco cultivation is the cause of such diseases for the farmers living in the same areas.

4.h.i. Monitoring & Document the labels and method of Pesticide Use

The labels of pesticides used for tobacco cultivation at each stage of production was collected and documented, even through photographs and videos.
Use of Pesticides and Impact on Wage Workers

Use of pesticides is integral to tobacco cultivation. At different stages of cultivation, pesticides are used. A close monitoring of four distinct steps starting from September and ending in April shows use of different levels of pesticide use. These include both liquid, powder and granular pesticides.

Table 34: The steps followed in Kushtia along with specific pesticide use are the following:

<table>
<thead>
<tr>
<th>STEPS</th>
<th>TIME PERIOD</th>
<th>NO. OF DAYS</th>
<th>PESTICIDE USE IN NUMBER/TIMES</th>
<th>BRAND OF PESTICIDES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: Seed bed preparation</td>
<td>September – mid October</td>
<td>45</td>
<td>21 pesticides/6 times</td>
<td>Afa poran, forwafuran, Farotak, Bistahian Kisani, Difen -m, Ridomil, Muin, Babistan, Kormil, Rodomil, Galjin, Likoji, Suntaf, Karataf, Ronvit, Thiovit, Fitovit, Antrakol, Microthiol.</td>
</tr>
<tr>
<td>Step 2: Seedling to drainage, fertilizer use and irrigation</td>
<td>Mid. Oct. – 30 November</td>
<td>45</td>
<td>6 pesticides/5 times</td>
<td>Basudin, Rojand, Furadan, Karter, Agrodan, Krishan</td>
</tr>
<tr>
<td>Step 3: Taking care of the plant</td>
<td>1st Dec. – mid January</td>
<td>45</td>
<td>27 pesticides/5 times</td>
<td>Kari, master, Sumithion, marshal, Darban, Metrofox, Normarflif fanan, Thiodin, Ustad, Hi-power, Ripcord. Amathrin, Fighter, Sensifar, Karathrin, Cyperthin, Petrophos, Thiovit, Sulflax, Pochavit, Comwlux, Fitavit, Sufravit, Basudin, Poracup, Malathion, Decis</td>
</tr>
<tr>
<td>Step 4: stem breaking to leaf harvesting</td>
<td>Mid. January – late April</td>
<td>105</td>
<td>1 pesticide/1 time</td>
<td>Fair-85</td>
</tr>
</tbody>
</table>

Table 35: In Cox’s bazar and Bandarban the steps are different in terms of number of days per step and use of pesticides. This is shown in the following.

<table>
<thead>
<tr>
<th>STEPS</th>
<th>TIME PERIOD</th>
<th>NO. OF DAYS</th>
<th>PESTICIDE USE IN NUMBER/TIMES</th>
<th>BRAND OF PESTICIDES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tap 1: Seed bed preparation</td>
<td>Mid. October – early December</td>
<td>50</td>
<td>7 pesticides/6 times</td>
<td>Furadan, Bavistin, Redomil, Asatuff, Koromil, Relethrin, Dersban</td>
</tr>
<tr>
<td>Step 2: Seedling to drainage, fertilizer use and irrigation</td>
<td>Early Dec. – 20 December</td>
<td>15</td>
<td>4 pesticides/6 times</td>
<td>Bavistin, Relethrin, Dersban, Knowin</td>
</tr>
<tr>
<td>Step 3: Taking care of the plant</td>
<td>21st Dec. – early February</td>
<td>45</td>
<td>7 pesticides/6 times</td>
<td>Pijor, Relethrin, Asatuff, dersban, Ripcord, Knowin, Hinosun</td>
</tr>
<tr>
<td>Step 4: stem breaking to leaf harvesting</td>
<td>7 February – early May</td>
<td>90</td>
<td>7 pesticides/5 times</td>
<td>Asatuff, Celcron, Sumicidin, Sevin, Ripcord, melathion, Marshal</td>
</tr>
</tbody>
</table>

Hours/days spent in tobacco works

Wage workers are hired for different kinds works from September to April. In Kushtia

Distribution of Labour and hours during tobacco growing period

Table 36: Land size: 1 Bigha (33 decimal)

<table>
<thead>
<tr>
<th>SL</th>
<th>STEP</th>
<th>MONTH</th>
<th>NUMBER OF LABOUR</th>
<th>HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seed bed</td>
<td>September- October</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Seedling Planting</td>
<td>October-November</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>Fertilizer use, Irrigation, Nursing</td>
<td>November- February</td>
<td>38</td>
<td>304</td>
</tr>
<tr>
<td>4</td>
<td>Leaf collection and processing for curing</td>
<td>March-April</td>
<td>12</td>
<td>96</td>
</tr>
<tr>
<td>5</td>
<td>Curing</td>
<td>March-April</td>
<td>11</td>
<td>88</td>
</tr>
<tr>
<td>6</td>
<td>Cooling</td>
<td>March-April</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>7</td>
<td>Remove leaf from steak</td>
<td>March-April</td>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>8</td>
<td>Grading</td>
<td>March-April</td>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>9</td>
<td>Beling and sealing</td>
<td>March-April</td>
<td>2</td>
<td>16</td>
</tr>
</tbody>
</table>
The highest number of labour is hired during November to February, i.e. 38 labours working for 304 person/ hours.

Table 37: Bandarban

<table>
<thead>
<tr>
<th>SL</th>
<th>STEP</th>
<th>MONTH</th>
<th>HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seed bed</td>
<td>September- October</td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>Seedling Planting to ring</td>
<td>October-November</td>
<td>112</td>
</tr>
<tr>
<td>3</td>
<td>Seedling to draining, fertilizer use and irrigation</td>
<td>November- February</td>
<td>168</td>
</tr>
<tr>
<td>4</td>
<td>Leaf collection and processing for curing and curing</td>
<td>March-April</td>
<td>270</td>
</tr>
</tbody>
</table>

4. I.i Treatment Cost

In a focus group meeting of tobacco and non-tobacco farmers the treatment cost incurred for different diseases was discussed and information was gathered. In this meeting the non-tobacco farmers were the conventional farmers who use chemical fertilizers, pesticides and irrigation. It is shown in the table below:

Table 38:

<table>
<thead>
<tr>
<th>Areas</th>
<th>Tobacco farmers (Average cost)</th>
<th>Conventional Agricultural farmers (Average cost)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kushthia</td>
<td>9,500</td>
<td>3,700</td>
</tr>
<tr>
<td>Chakaria (Cox’sbazar)</td>
<td>19,000</td>
<td>6,000</td>
</tr>
<tr>
<td>Bandarban</td>
<td>17,500</td>
<td>5,800</td>
</tr>
</tbody>
</table>

4.I.iiInterviews of Drug sellers and village doctors

Chakaria-Lama, Bandarban

In Maijkakara, a medicine seller locally known as Dr. Ratan said that most of the tobacco farmers and labours do not seek any medical advice from a qualified doctor, rather they go straight to the drug seller and ask for medicine, particularly for children. During February to April, they ask for medicine for respiratory problems and diarrhea. It could be due to inhalation of smoke from the kiln. Other times, he is asked for body pain, weakness, vomiting tendency, jaundice, drying of breastmilk of mothers etc.

Dr. Joy Datta of Lama Bazar is also a drug seller in the market. According to him, most of the people who come for medicine are suffering from chronic illnesses. They have memorised the name of the medicine that was prescribed to them. Now they come and ask for the specific medicine. Most people come for respiratory problems, asthma, diarrhea, weakness, headache and hyper tension.

Chatian and Kachuadaha of Mirpur

Dr. Rukman Ali of Chatian village said, during the time tobacco is grown most people come for cold fever, allergy, dysentery, gastric, weakness and urinary infections. They also complain about mental anxiety and hypertension.

Dr. Jahangir Alam and Dr. Shamsuzzoha said, during tobacco cultivation time, many people tensed whether they will get the price to cover the cost. So they suffer from hypertension. They also come for diarrhea during curing of leaves. A gas from the leaves is inhaled by the children and women and also they face high temperature sitting in front of the kiln (Tandur). This may cause diarrhea.
5. DISSEMINATION AND POLICY ADVOCACY

Specific Objective 5: Develop educational materials that support and inform discussion of specific policy and program initiatives in tobacco growing regions and public debates on the 2005 Anti-Tobacco Uses Bill.

5.a. Develop educational materials

1. Developed educational posters, leaflets and Bill boards to be publicize the message in the research areas.

2. Developed video materials on the steps of tobacco cultivation and use of pesticides and health problems

3. Extensive photo documentation has been made to provide relevant information as education material

4. Actions with Working for Better Bangladesh (WBB, Trust) and Bangladesh Anti-Tobacco Alliance (BATA) in ammending the Anti-Tobacco Bill to support farmers shifting out of tobacco.

5.b.i SAS Exercise

Use of SAS tool: SAS Tool: Stakeholder Analysis: CLIP

SAS exercise of Stakeholder analysis was carried out to find out the level of support from different people and institutions in the society.

FRIENDS JOIN TOGETHER TO STOP TOBACCO CULTIVATION

Facilitator: Rafiqul Haque Titu

Reporter: Mahmuda Begum Nargis, Mujahidul Islam Prince & Abdur Rauf

Venue: Akhrabari, Kushtia

Date: 27 October, 2010

Participants: 10 farmers from Najibpur village, Daulatpur, Kushtia

In the context of general awareness about the aggression of tobacco cultivation in different parts of Bangladesh and the harmful impact on environment, human health and overall food production, more people are joining in the efforts to stop tobacco cultivation and to encourage food production. UBINIG has been working in three areas such as Kushtia, Cox’sbazar and Bandarban and has been able to mobilise farmers for food production. UBINIG has disseminated the information received about the specific impacts of tobacco cultivation on soil, water, plant genetic resources, human health, livestock and more importantly how the food production has been reduced in those areas.

Even though, there is a common concern against tobacco cultivation, it is not very easy task to stop its cultivation because there are many vested interested groups involved and are benefitting from it. They also belong to the powerful section of the society having the money and have control over the local administration.
Nevertheless, UBINIG has attempted to develop alliance with different social groups in its effort to stop tobacco cultivation and to grow food. In its search for friends, UBINIG conducted a meeting with farmers of Najibpur village of Daulatpur upazila of Kushtia with Stakeholder Analysis, Collaboration, Power Interest and Legitimacy, CLIP on 27 October, 2010. The purpose was to identify friends and develop an alliance with different levels of power, interest and legitimacy and their levels of potential collaboration in this venture of stopping tobacco cultivation.

In the beginning of the meeting, it was discussed who are different stakeholders who may be interested in such collaboration. These were:

Farmer: Model farmers, farmers interested in food production, farmers benefitted from food production, farmers negatively affected by tobacco cultivation, Land owner not interested in leasing land for tobacco and Nayakrishi farmers

Socially conscious people: There are many people in different occupations but have seen the harmful effects of tobacco cultivation. In this village, these are village doctor, school teacher, educated people, Imam of the mosque and Matbar/Mondol – the village leader.

Government institutions: Since there is a law against the usage of tobacco products and at the national level, the government institutions have taken some steps to reduce tobacco usage and tobacco production, the local office of the Bangladesh Agricultural Development Corporation (BADC), Government owned Commercial Bank, government Hospital, local Agricultural extension office, District Commissioner and the District Judge are found to be potential allies for stopping tobacco cultivation.

People’s representatives: The members of the local government such as the UP member and Chairman, Upazila Chairman and local Member of Parliament are opposing the tobacco cultivation.

Social institutions: There are several Youth organisations, NGOs (especially those who are engaged in EPI programme) and Nayakrishi Andolon as an organised farmers group are actively supporting the issue of stopping tobacco cultivation.

Media: Local level journalists are regularly reporting about the effects of tobacco cultivation and how it is going to affect the food production of the area.

However, although many people are generally opposed to tobacco cultivation, in their respective positions, they have different levels of Power, Interest and Legitimacy to be able to effectively contribute towards stopping tobacco cultivation and to grow food crops.

So the next step was to find out the Power, Interest and Legitimacy levels of each stakeholders with whom the alliance will be developed. The following picture emerged:

Farmers: Those who have benefitted from food crop cultivation and those who are negatively affected by tobacco cultivation have high ranks of Power, Interest and legitimacy (PIL), because if these farmers want to stop tobacco farming and grow food crops, then they can do it and also can influence others. However, the land owners have high power (P) to influence other farmers, but have very little interest to stop tobacco farming as they still see that tobacco will bring cash money. On the other hand, the Model farmers are interested to grow food crops and have the legitimacy to talk about it (IL), but have little power to influence others.

Socially conscious people: Among the socially conscious people, they have
legitimacy and also interest (IL) to some extent, to talk about the harmful effects of tobacco cultivation, but except the village leader, none of them have any power. So this is a weak group but important because they can play an important role because they are respected in the society and if they are given more power through information sharing and building connections with other stakeholders.

Government institutions: The government institutions have power to implement the policy and of course they have the legitimacy, but only the Agricultural office, has been found to have Power, Interest and Legitimacy (PIL), the others have Power and Legitimacy (PL). The Interest level is still very low because of lack of specific policy from the government with regard to support for food production and not to allow tobacco cultivation.

Peoples’ representatives: All the people’s representatives list as stakeholders have power, interest and legitimacy (PIL). It means that if they take actions to stop tobacco cultivation it will have positive impact.

Social institutions: The Youth organisations are weak and the NGOs have interest and legitimacy (IL) but have no power to stop tobacco cultivation as they are not engaged in food production activities. But Nayakrishi Andolon has PIL, because it is supplying seeds, offering training to produce food without the use of fertilizers and pesticides and also helping for marketing of produces to those farmers who are willing to shift out of tobacco. So they enjoy PIL as farmers listen to them and follow their directions.

Media: The local journalists are active and have been able to publish in the newspapers and the electronic media have shown in the TV channels. This gave them the power, interest and legitimacy to play important role to stop tobacco cultivation.

But for the alliance building it is not enough to know the different levels of power, interest and legitimacy of the stakeholders, but UBINIG also has to know their willingness to cooperate in the initiative to stop tobacco cultivation and to grow food crops. It was found that among those who have PIL, the expected levels of support are high for farmers negatively affected by tobacco cultivation and farmers benefitted by food production. With them Nayakrishi farmers are there to provide high level of support. The journalists, Agricultural office, Upazila Chairman and the Union Parishad Chairman are expected to give medium support. It is possible to build a horizontal level of Alliance with these two groups.
The Village leader, Imam of the mosque, school teacher, Bank officer, District Judge, government hospital and the NGOs will be able to give support if they are empowered with information, and engaging them in various activities to make them visible and thereby increase their power and legitimacy, and even generate interest.

In the circle of PIL (Power, Interest and Legitimacy) there were local journalists, farmers interested in food production, farmers negatively affected by tobacco cultivation, local government leaders Nayakrishi farmers, agricultural office and the parliament members of the area were there.

These exercise helped develop materials which are needed for dissemination of the results on the impact of tobacco cultivation with analysis of stakeholders.

5.c. Dissemination and Policy Advocacy: periodic meetings, workshops

1. The adverse impacts of tobacco were raised by the UBINIG representative in the inaugural event of the Surajpur – Manikpur Union Parishad. On 8 February, 2010 this meeting was attended by about 500 participants including The Deputy commissioner Cox's Bazar, Upazila Chairman, Union Parishad chairman political leader, government officials, journalists and other members of the society.

2. Workshop, “Threat of Tobacco Production, Food Production and Approach to conservation of Environment” was organized by UBINIG on 14 February 2010 at National Press Club, Dhaka. The workshop was attended by NGO workers, journalists, physicians, farmers and other members of the society.

3. Mr. Shawkot Momin Shahjahan, M.P and Chairman, Parliamentary standing committee for Agriculture graced the event as the chief guest.

4. Workshop on “Food production and conserving Environment by abandoning Tobacco” was held on 24 March 2010 at Lakhayarchar Union Parishad campus. The workshop was attended among others, including the District Administrator, Cox’s Bazar; the upazila chairman, chakoria; upazila, Agriculture officer, forest officer; farmers, journalists and representatives of other organizations and professions.

5. Discussion meeting on “Threat of Tobacco Production, cultivation of Food Crops and Conservation of Environment was held on 30 March 2010 at Nasiruddin College Ground, Barogangdia Daulatpur, Kushtia. The discussion meeting was attended by farmers, Teachers, journalists and other residents. Mr. Afazuddin, M. P. was present as the chief Guest.

6. Discussions are held on adverse impacts of tobacco production in the monthly Government and NGO Coordination Meeting in five upazilas where tobacco researches are conducted.

7. UBINIG participated in the discussion meetings organized by the ministry of health and family welfare in the Bangladesh secretariat, Dhaka for amendment of the Tobacco and Tobacco products usage and control Bill 2005.

8. Participated in the training workshop program organized by Bureau of Economics University of Dhaka and University of waterloo Canada on International Tobacco Control Policy Evaluation in Bangladesh from 17-20 January 2010
5.d Bandarban Court case and lobbying

A public interest litigation was filed by two local journalists in Bandarban of Bangla daily 'Amader Shomoy's Bandarban correspondent Alauddin Shahriar and the district Press Club's general secretary Zafar Iqbal on Aug 18. The District Judge Court, Bandarban issued a temporary injunction for banning of tobacco on 19.8.2010. The court judge Mohammad Shamsuddin Khaled issued the order and asked 22 persons, including the deputy commissioner, seven Upazila Nirbahee Officers (UNO), police chiefs, Bandarban and Lama forest officers and agriculture officers and British American Tobacco Company, Dhaka Tobacco Company and Abul Khair Tobacco Company to explain within seven days why tobacco furnaces and warehouses should not be relocated. They submitted their explanation on Aug 26, 2010.

On Sep 2, the court issued several instructions on the production of tobacco in the district.

On Sep 5, the court upheld a previous injunction on tobacco production in the district and asked the defendants to explain within seven days why tobacco furnaces and warehouses should not be relocated.

The instructions included a ban on tobacco production in new land and tobacco companies' assistance to the farmers.

This news was circulated very quickly at home and abroad and created a significant sensation among the conscious citizens including the crop raising farmers.

UBINIG has been actively working for creating public opinion supporting the court order. The Nayakrishi farmers, teachers, students, public representative and members of all other walks of life were organized in the light of the count order for banning tobacco production. Human chains were organized in the command areas of research, prior to hearing date of the case in the court. The human chains were organized in the following venues and dates:

1. On 28 August 2010 a human chain was organized in front of the Public Library, Kushtia. Farmers, representatives of seven Non Government Organizations (NGOs) students, journalists and others participated in the human chain.
2. On 28 August 2010 another human chain was organized at Chakaria Commercial Center, Chittagong - Cox’sbazar highway. The representatives of eight NGOs, journalists advocates, public representatives business men, transport workers, teachers, students, farmers and others participated in the meeting and the human chain.

UBINIG organized a human chain at Ali Kadam upazila Parishad Headquarters on 9 November 2010 demanding Bandarban district to be free from tobacco production according to the order of the court. Farmers, the farmers affected due to tobacco production, Adibashi representatives, Journalists, Agriculture Officers, Public Representatives, NGO representatives participated in the event and demanded full implementation of the court order for banning tobacco production.

The tobacco booklet was given to the lawyers fighting for the case and those supporters of the petitioners.

5.e. Observation of Day: WORLD FOOD DAY, 2010

On 16 October, 2010 the World Food Day UBINIG organized a rally and a meeting at Chakaria, Cox’sbazar demanding a ban on cultivation of tobacco on land suitable
for cultivation of food crops. The Upazila Administration, Department of Agriculture Extension (DAE) and the members of civil society participated in these events. The Upazila Nirbahi Officer, Upazial Agriculture Officer and other conscious citizens demanded for not growing tobacco on land suitable for growing food crops.

5.f. Policy Advocacy for marketing of food crops

In Bangladesh, the lack of policies to support farmers for marketing the food crops becomes a big hindrance for remaining in the food production. Usually the bumper food crops lead to farmers earn less as has been seen in the case of potato, jute, rice and different vegetables. Farmers living in remote areas face even more difficulties in marketing of their produce. The cold storage facilities are also inadequate and are not affordable for the poor and marginal farmers. This year (2010-11) the farmers in the research areas have done a marketing survey to know about the possibilities of marketing of food crops.

Table 39: Prospects of marketing of crops grown in Cox’sbazar-Bandarban and Kushtia

<table>
<thead>
<tr>
<th>CROPS</th>
<th>PROSPECT OF MARKETING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cox’s Bazar - Bandarban</td>
<td></td>
</tr>
<tr>
<td>Potato</td>
<td>The farmers started potato harvest since the last week of January. The price of potato that time was BDT 20-25 per kilogram. The current price is BDT 15-16 per kilogram. Comments: Dohazari variety of potato grown by the Nayakrishi farmers is popular. It is much on demand on the market.</td>
</tr>
<tr>
<td>French bean</td>
<td>Green French bean has been marketed since the second week of January. The price of bean in the market was BDT 50-60 per kilogram. The farmers have been collecting the ripe seeds of French bean since the first week of February. The current price of ripe French bean seed is BDT 40-50 per kilogram. These seeds can be stored after proper drying. The stored seeds can be sold in the market, BDT 70-80 per kilogram in the next season. Comments: This crop is also locally popular and it is much on demand round the year.</td>
</tr>
<tr>
<td>Radish</td>
<td>The farmers disposed radish in the market during December, 2010 to January, 2011. The market price of radish was BDT 20-25 per kilogram. Currently the price of radish has come down to BDT 5-6 per kilogram. The radish can not be kept in the shelf for marketing for long time. However the farmers maintain seeds in their own hands. Comments: The farmers have been benefited from radish production because of higher market price this year.</td>
</tr>
<tr>
<td>Felon (cowpea)</td>
<td>The farmers can store felon. The yield of felon was appreciable this year. The felon is still in bearing stages for which it could not be marketed. It is anticipated that the market price of felon will be BDT 60 per kilogram this season. Comments: The farmers can store felon and as such it is a prospective crop for the farmers.</td>
</tr>
</tbody>
</table>
Sweet gourd is a profitable crop. It does not involve high cost of production. All parts of the plant including leaves, flowers, twigs and fruits are much on demand in the market. The farmers can also stone the ripe sweet gourd. Raw sweet gourds, ripe and un-ripe are sold in the market BDT 12-15 per kilogram.

Comments: Sweet gourd is a prospective crop for the farmers for it does not involve much cost of production.

Potato

Market price of potato was BDT 7-8 per kilogram at the time of harvest during end of January. The market price of potato was BDT 4-5 per kilogram during the second week of February 2011. It is anticipated that the price of potato may go up to BDT 10 per kilogram. The price of seed potato saved in cold storage may go up to BDT 16-25 per kilogram in the next season.

Mustard/rye

In the present season, second week of February, the price of mustard was BDT 1400-1500 per mound. After three months, in June the price will go up to BDT 1700-2000 per mound.

Lentil

The market (mid February, 2011) price of lentil was BDT 3000 per mound. After three months, the price will go up to BDT 3500 - 3800 per mound.

Wheat

The market (mid February, 2011) price of wheat was BDT 800 - 1000 per mound. After three months the price may go up to BDT 1200 - 1400 per mound.

Garlic

The market (mid February, 2011) price of garlic was BDT 4000 - 4500 per mound. After three months the price may go up to BDT 6000 - 8000 per mound.

Coriander

The market (mid February, 2011) price was BDT 80-100 per kilogram. After three months it is expected to go up to BDT 150 - 200 per.

Maize

The market (mid February, 2011) price of maize was BDT 500- 600 per mound. After three months the price will go up to BDT 700 - 800 per mound.

5.f. Agricultural Policy Issues

Regulation on tobacco cultivation is an urgent need for solving food crisis and for saving the environment and human health. However, since it is neither completely under agriculture, nor in industry, the regulation has not been very successful with enactment of the SMOKING AND TOBACCO PRODUCTS USAGE (CONTROL) ACT, 2005 by the Ministry of Health of the Government of Bangladesh. This law is enacted with a view to controlling smoking, production of Tobacco, use, purchase, sale and advertisement. However, the bill also provides options about giving loan for food crops production in article 12.
Article 12: Credit support for growing crops alternative for tobacco

Existing Clause

12. To provide credit for growing alternate crops in lieu of tobacco products – (1) with a view to discouraging the farmers from growing tobacco and to encourage for growing cash crops, the government will provide loan on easy terms, such provision will remain effective for five (5) years from the date of implementation of the rule.

(2) The government will frame policies in order for continued discouragement of the production and use of tobacco products and to discourage for the establishment of industries on tobacco products.

Since the enactment of the law, more than five years have passed but no support was given to the farmers willing to shift out of tobacco. However, Bangladesh Bank has taken some initiative which is laudable to discourage tobacco cultivation.

Need for correction

12 (1) The time limit (5 years) may be withdrawn for offering loan facility to farmers for encouraging food crops production in Lieu of tobacco.

Corrected / Amended Rule

a. Involvement of The Department of Agriculture Extension (Upazila
b. Agriculture officer and Block Supervisor) and encouragement and cooperation for alternative crop
c. Supply of the seeds of indigenous varieties of rabi crops
d. Marketing facility for alternative crops

Providing loan to farmers in easy terms and low interest in different seasons round the year for growing alternate crops in lieu of tobacco production.

Bangladesh Bank Circular: No loan for Tobacco farming

With a view to discouraging the production of tobacco, The Bangladesh Bank, the central bank of the country, in a circular on 18 April 2010 has ordered all the scheduled commercial banks for not granting any loan for tobacco farming. The Bangladesh Bank has taken this decision keeping in view the concerns about public health, economic condition, food crisis and environment.

The circular of the Bangladesh Bank mentioned that smoking and use of tobacco products are threats to public health and food security. The direct users of tobacco, their family members including children and others, colleagues, in addition tobacco producers, processors, workers and all other peoples around are affected by the adverse impact of tobacco. The production of food crops has been reducing with time due to extension of tobacco production. A huge quantity of fuel wood is needed for curing of tobacco leaves, which releases poisonous smoke in the environment. Consequently trees are logged indiscriminately and the environment is polluted by the poisonous smoke.

Under these circumstances it was advised for not granting any loan for tobacco production. The Circular also noted that previous disbursed loan
for tobacco should be adjusted and realized just on schedule. Such loans shall not be renewable or extended in any case (The daily Shamakal, 19 April, 2010).

It may be noted that Anti Tobacco campaign, results of different research on tobacco causing food deficit and anticipated impacts of tobacco on farmers have contributed to such bold decision by the Bangladesh Bank.

**Decision by the Ministry of Agriculture: Withdrawal of Fertilizer subsidy**

The Ministry of Agriculture, GoB is aware of the adverse impacts of the tobacco cultivation. One of the intelligence agencies of the government had investigated the adverse impacts of tobacco cultivation on behalf of the Ministry last year (2009).

The agency had conducted through investigation in the south western region, including Kushtia district and adjoining areas. The Agriculture Minister, Begum Matia Chowdhury has approved the report on 15 April, 2010. It had been indicated in the report that the number of tobacco farmers increased alarmingly in Kushtia region. The tobacco producers were introduced at the cost of food crops including rice. Short and long term recommendations have been made in the report to change the situation. Withdrawal of subsidy on fertilizer for tobacco farming has been mentioned as an immediate measure. Fertilizer subsidy was withdrawn from the tobacco farmers based on the recommendation of that report. It was learnt that 18-20 thousand metric ton of fertilizer is used on for growing tobacco on 49,000 hectares in Kushtia region (The Jugantor, 17 April, 2010)

Since in recent days, the Ministry of Agriculture has taken strict measures for withdrawal of subsidy for the tobacco growers, the company has given different directions for the Card Holders to collect Urea fertilizer at a time when it does not compete with Boro crop. The tobacco growers are asked to collect Urea fertilizer at the time of Aman season with loan given by the company. The dealers also charge higher price (Tk. 50 – 100 more per bag of fertilizer). However this creates condition for corruption on the part of dealers and DAE field officers for supplying 500kg of fertilizer per acres resulting in crisis of fertilizer during Boro season. The Tobacco companies collect TSP and SOP from the Ministry of Agriculture and the Ministry of Industries and then distribute it to the tobacco growers.

Imposition of Export Tax in the National Budget

In the last budget of 2010-11, an export tax of 10% was imposed on tobacco leaves by the Ministry of Finance.

**5.g. Responsible Ministries for Regulating Tobacco cultivation**

The government of Bangladesh signed the WHO Framework Convention on Tobacco Control (FCTC) on 16 June 2003 and ratified the same on 10 May, 2004, accordingly Bangladesh has its own law on tobacco control. However, implementation of SMOKING AND TOBACCO PRODUCTS USAGE (CONTROL) ACT, 2005 will remain incomplete without clear regulatory measures against the tobacco cultivation. Tobacco companies are able to advertise their so-called Corporate Social Responsibilities (CSR) by providing Bill Boards with messages on tree plantation, medicinal plants, climate change etc. They even manage to get Environmental awards!

But the main problem is that there is a lack of clear understanding as to the question of the relevant Ministry in respect of taking decision for controlling tobacco production and such other issues. Let’s look at different ministries and their relevance
Ministry of Finance and NBR are the recipients of tax from tobacco companies. So they can increase tax on tobacco products as well as tobacco export and earn more revenue. It will help discourage tobacco cultivation.

Ministry of Agriculture will be very effective if the Department of Agricultural Extension can ensure by supporting food crop production and provide necessary inputs to farmers and provide marketing facilities.

The Ministry of Industries can ensure that the fertilizer distributed to dealers must go to food producing farmers.

Ministry of Land can ensure that the land suitable for food production should be restricted against tobacco production and also protect the government Khas land from tobacco production.

Ministry of Commerce can monitor the exports of tobacco leaves and regulate the trade licenses of the companies. They can also monitor the increased food import (specially pulses, rice) as created by tobacco cultivation.

Ministry of Food and Disaster Management monitors the situation of food crisis, but must link it to food crisis created by tobacco cultivation and thereby take necessary action.

Ministry of Labour must ensure the labour utilisation, wages and also prohibit use of child labour in different stages of tobacco production.

Ministry of Environment & Forest can play significant role in protecting the forest from tobacco curing by making a separate law ensuring no tree be cut to cure tobacco. They can take initiatives against pollution of water, and village environment during the curing time. Demands are made by village people not to build Kilns within 500 meters of educational institutions.

Ministry of Education must make sure children are able to get education in the tobacco growing areas. It is to be noted that the tobacco curing season is the time of Secondary School Exams and many students have to drop because of the need for working as family labour. Young children are occasionally dropping in and out of education due to tobacco related works.

The Ministry of Home Affairs, Law and Justice Ministry and the Health Ministry are very crucial for their role in making necessary amendments in the Tobacco Control Law by including issues of tobacco cultivation and ensuring proper implementation. The Health Ministry have take into account the health hazards due to tobacco cultivation.

The other Ministries such as Ministry of Women and Child Affairs, Cultural Ministry and the Ministry of Religious Affairs can play significant role in ensuring safety of people from the hazards of tobacco cultivation.

A comprehensive policy on tobacco control in general and control tobacco cultivation in particular must be taken up by the government. As a part of global movement against usage of products, Bangladesh government as well as the groups working on tobacco control must incorporate the issues of harmful impact of tobacco
cultivation on environment, food production and human health. It is not only the Ministry of Health that can take decision on controlling tobacco cultivation, but the Ministry of Finance, Ministry of Environment and Ministry of Agriculture must act together to regulate tobacco cultivation. (Appendix 9, 10, & 11)
## Project Outcomes

<table>
<thead>
<tr>
<th>Specific Objective 1: Refine, replicate and assess alternative cropping systems</th>
<th>OBJECTIVE</th>
<th>OUTPUT</th>
<th>OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Agricultural research &amp; training workshop</td>
<td>8 training workshops held</td>
<td>Awareness on the effects of tobacco on food production, environmental degradation, health hazards, deforestation, education of children increased and farmers were prepared to shift out of tobacco with all necessary information.</td>
<td></td>
</tr>
<tr>
<td>b. Collect base-line information on study area</td>
<td>Base-line information on study area was collected in 20 villages of 14 unions under 5 upazila in 3 districts</td>
<td>UBINIG could collect reliable information in the research areas about actual areas under tobacco cultivation. UBINIG became a source of information in the research areas of Cox’sbazar, Bandarban and Kushtia as well as at national level on tobacco cultivation and its impact.</td>
<td></td>
</tr>
<tr>
<td>c. Assess market for promising crops</td>
<td>Assessment was accomplished through assessing community bazaars (10) and warehouses (4) in respective study areas. It was done using SAS method and information collection. A total of 11 SAS exercise was done using “time line” technique.</td>
<td>Farmers under research were engaged in the assessment of the market at local level for the promising crops. The market mechanism with supply and demand side and control by market syndicate was understood. The marketing chain from farmer to middlemen and the whole sellers is quite complicated. People in the area are now dependent on imported food crops, while they could grow their own food. Further research and action needs to be done on the marketing of food crops grown in the tobacco growing areas in order to compete with the tobacco companies who offer assured marketing of tobacco leaves.</td>
<td></td>
</tr>
<tr>
<td>d. Design &amp; implement field experiment</td>
<td>Total of 16 village level meetings, SAS exercise using of 5 techniques including HH profile (13), stakeholder analysis (3), force field (1) &amp; ecological domain (10) were organized.</td>
<td>Field experiment demonstrated the feasibility of shifting out of tobacco to food crops at the national level. The economic benefit could be established and more farmers are drawn into shifting even on their own initiatives. It was also established that tobacco production is a threat to food production. However, farmers needed support for seed distribution, training on biodiversity-based farming so that they do not have to use chemical fertilizer-pesticides, and marketing is needed. Policy advocacy on support for farmers is established.</td>
<td></td>
</tr>
<tr>
<td>e. Monitoring field experiments</td>
<td>Monitoring was undertaken in each step of activity and still photos were taken for documentation. The reports were also produced.</td>
<td>Farmers are encouraged by monitoring as they have to face the Tobacco company field officers all the time. In such a situation monitoring of food crops is necessary.</td>
<td></td>
</tr>
</tbody>
</table>
### Specific Objective 2: Pilot a farmer-based model of seed supply and technical assistance

**a. Facilitate farmers’ access to agricultural seeds through Nayakrishi Andolon**

Seed distribution was accomplished for transition & substitute crops among 221 farmers in 3 study areas. An exchange visit involving 60 farmers was held to see Nayakrishi Seed Hut (SH) and Community Seed Wealth (CSW).

Information was collected on existing local seed systems and the challenges for the farmers to engage in local food production. Information was also collected on the role of Nayakrishi Seed Network (NSN), CSW and SH and how the farmers are engaged in cost-effective method for food production through their involvement with NSN, CSW and SH.

The need for establishment of farmers’ seed system that makes them independent of market for seed supply. The Nayakrishi Seed Network was an encouragement for the farmers. More seed huts needed to be established in the tobacco growing villages. Farmers’ knowledge, particularly those of women, was acknowledged and encouraged. The threat of erosion of knowledge and practices of seed preservation was addressed by encouraging farmers to establish seed hut.

A sustainable and reasonable cost seed hut at the village was calculated. However to make a sustainable farmer based seed system with a cost of 250,000 Taka (3000 USD) can help about 500 farming families from 10 villages, i.e. an average 50 USD per farmer investment for seed system can sustain the food production. Nayakrishi Seed Network gained popularity among the farmers in tobacco growing areas who want to shift to food production.

**b. Document the cost & institutional arrangements needed to sustain diverse local seed systems.**

<table>
<thead>
<tr>
<th>Type of Communication Tool</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poster &amp; leaflet</td>
<td>Published as communication tools and distribution was done to motivate farmers conceptually.</td>
</tr>
<tr>
<td>Videos</td>
<td>Composed and performed drama in their community.</td>
</tr>
<tr>
<td>Booklet</td>
<td>Became a resource material for tobacco farmers, journalists, civil society, NGOs, lawyers, teachers, doctors, women’s organizations, local government representatives and parliament members.</td>
</tr>
</tbody>
</table>

### Specific Objective 3: Appropriate training and decision-making aids for farmers

**a. Create & test communication tools designed to inform, motivate & guide tobacco farmers on key issues**

Poster & leaflet were published as communication tools and distribution was done to motivate farmers conceptually.

Videos were done. The farmers composed and performed drama in their community.

Posters and leaflets were used at local and national level. The booklet became a resource material for tobacco farmers, journalists, civil society, NGOs, lawyers, teachers, doctors, women’s organizations, local government representatives and parliament members.

A general awareness is created and people are more informed not only about the harmful effects of tobacco but also about the possibilities of cultivating food crops.
c. Dissemination of results and preparation of materials

Many presentations were made and articles were written in the national and local newspapers on the impact of tobacco cultivation on food production. The general readers became interested in issues of tobacco cultivation as part of the tobacco control campaign. The booklet published on the harmful effects of tobacco was used as a resource material. This has resulted in clarifying the technical aspects of shifting out of tobacco.

d. Testing of training materials

The Nayakrishi 10 rules were reformulated and tested for addressing the particular situation of tobacco farmers to shift to food crops. 8 pilot training programmes with 20 farmers in each training session were organised. Nayakrishi ten rules for tobacco farmers was formally adopted as a training material for the Learning sessions and the Nayakrishi farming system got recognition as a way out.

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Specific Objective 4: Document and assess the impacts of tobacco farming on the health of men, women and children in farming households and among agricultural workers

a. Collect & review literature & national information on respiratory & pesticide related illness

Information collection & literature review was done on national information on respiratory & pesticide related illness. There are very few information available in terms of impacts on health due to tobacco cultivation. The literatures that are available are mostly based on other countries.

b. Organize focus group discussion on health issues

A total of 16 focus group discussions were held in 3 research areas. The discussions at the village level not only helped raise information also to create awareness on health aspects of tobacco cultivation. The tobacco farmers gave information on various illnesses they suffered at different stages of tobacco cultivation from October to April. They also gave information on exposure to pesticides. These are first of its kind in Bangladesh, which will help develop further research. The discussions were the first of its kind in Bangladesh, which will help develop further research.

c. Monitor & document the level & methods of pesticides use & smoke exposure in the study areas among sample

The information was collected & documented through still photos and video. The videos and the photos were very useful to disseminate the information to a wider circle of people including journalists and policy makers.
d. Observe & interview sample HH regarding health condition

A total of 176 households in Kushtia and 204 families in Cox’sbazar-Bandarban were observed for recording health problems one in a week for a period of 72 weeks during June 2009 – May 2010.

The self reported and observed illnesses showed high incidences of pain (including back pain, leg, waist, and joint pains) and gastric diseases during the tobacco cultivation period for the family members particularly for the head of the household and wife.

The incidences of illness are much less for the conventional farmers compared to tobacco farmers. The cost of treatment are also received ranging from Tk. 9,500 to Tk. 17,500 and in comparison the non-tobacco farmers have yearly treatment cost ranges from Tk.3,700 to 5,800. These farmers are also using pesticides for food crops, yet have less diseases compared to tobacco.

e. Do comparative assessment on disease pattern

The assessment was done under epidemiological research.

Specific Objective 5: Develop educational materials that support and inform discussion of specific policy and program initiatives in tobacco growing regions and public debates on the 2005 Anti-Tobacco Uses Bill

a. Develop a range of educational materials summarizing different aspects of the research, targeting local officials, policy makers, non-governmental organizations and the media

A range of educational materials including poster, leaflet, bill board, still photos, video, power-point presentations were published and prepared.

The impact of bill boards was tremendous as farmers were inspired to know that growing food crops is possible and should be done to remain healthy. The spots of the bill boards were done strategically to attract attention of common people.

b. Organize periodic meetings & workshops involving representatives of relevant miniseries & non-governmental organizations

Two (4) regional and 1 meeting workshops involving parliament members, Deputy Commissioners, Upazila Chairman, administrations, relevant departments, NGOs, media took part these events. Recommendations were published in media and were sent to

The outcome of the workshop were seen in taking up the issues of tobacco cultivation by Anti-smoking lobbying groups. UBINIG was invited in all the meetings to discuss on tobacco cultivation. Several policy decisions by the Bangladesh Bank, Agricultural Ministry, Ministry of Finance, Ministry of industries imposed restrictions on support to tobacco cultivation. At the local level, tobacco cultivation was stopped in the government Khas land. Local administration in Cox’sbazar and Bandarban was pro-actively discouraging tobacco farming. More newspaper and electronic media reports were published on the harmful impact of tobacco inducing even journalists to file case against cultivation in Bandarban district.
At the local level in Chakaria, Tobacco control Task Force invited UBINIG to be a member in the Upazilla Health Complex, Chakaria to provide information on health hazards related to tobacco cultivation.

Due to UBINIG’s work in the area, tobacco issues are raised regularly in the district level Law and Order coordination meetings and tobacco cultivation and specially logging of trees is discouraged. Specific actions were taken against Kilns which had forest trees logged and the kilns were broken in February 2010.

The local administration leased out 40 acres of Khas land where tobacco was planted illegally, and farmers were given the land for food production.

c. Organize a National Seminar on the problem of tobacco production

The National seminar held in Dhaka could bring Parliament members and other Anti-tobacco groups, agricultural scientists to discuss about harmful effects of tobacco before the budget 2010-2011. In the budget a 10% tax on export of tobacco leaves was allocated.

The demand for No Tobacco in crop land was taken up by the Ministry of Land and a Land zoning Act is now being drafted. UBINIG is working on bringing up no tobacco in crop land to be included in the Act.

d. Organize rallies & educational campaigns during relevant Int’l days

People of all walks of life are involved in the rallies in the rallies organized by UBINIG spontaneously. There is a general consensus developed on the harmful effects of use of tobacco products as well as tobacco cultivation.

The World No Tobacco Day has become popular event at district and national level.
Project outputs and dissemination

The various activities carried out under the project intended to bring out the following outputs:

- Number of farming households becoming free from tobacco production have increased, and the acreage of land under food production increased.
- Farmers will develop a system to have access to seeds and marketing of crops.
- Food production and the availability of food in the tobacco producing areas will be increased.
- More villages will be involved in shifting out from tobacco after knowing about the research villages and the farmers.
- Nayakrishi will become a method of production as it reduces the cost of production significantly.
- Ways will be found to reduce the vulnerability of the indigenous communities to tobacco production by developing effective alternative programmes.
- Awareness on occupational health problem will be increased and the doctors will be made aware about the necessary treatment facilities.
- More information is disseminated at the national level and at the policy making level to take necessary actions in the light of Anti-Tobacco Law to support farmers for alternative crops.

### Table 40: Area coverage by Nayakrishi practices in villages

<table>
<thead>
<tr>
<th>DISTRICT</th>
<th>UNION</th>
<th>VILLAGE</th>
<th>CULTIVABLE AREA</th>
<th>TOBACCO AREA</th>
<th>YEAR 1 Food crops</th>
<th>YEAR 2 Food crops</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cox'sbazar</td>
<td>1. Kakara</td>
<td>1. Maijkakara</td>
<td>49.6</td>
<td>24.6</td>
<td>4.50</td>
<td>5.00</td>
</tr>
<tr>
<td></td>
<td>2. Utter Lotoni</td>
<td>12.6</td>
<td>9.89</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Surajpur-Manikpur</td>
<td>288.60</td>
<td>239.09</td>
<td>2.50</td>
<td>2.25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Uttar Surajpur</td>
<td>386.50</td>
<td>315.80</td>
<td>-</td>
<td>1.28</td>
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<tr>
<td></td>
<td>3. Bamubilchiri</td>
<td>6. Pannisarbeel</td>
<td>205.37</td>
<td>188.05</td>
<td>3.18</td>
<td>4.11</td>
</tr>
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<td></td>
<td>7. Maizpara</td>
<td>386.03</td>
<td>182.20</td>
<td>-</td>
<td></td>
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<td>Total</td>
<td></td>
<td></td>
<td><strong>1325.95</strong></td>
<td><strong>964.16</strong></td>
<td><strong>12.41</strong></td>
<td><strong>20.14</strong></td>
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<td>Bandarban</td>
<td>4. Lama Sadar</td>
<td>8. Sabekbilchiri</td>
<td>254.49</td>
<td>85.82</td>
<td>2.05</td>
<td>2.50</td>
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<tr>
<td></td>
<td>5. Rupashi para</td>
<td>9. Ongla Para</td>
<td>590.98</td>
<td>350.35</td>
<td>-</td>
<td>2.10</td>
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<td></td>
<td>6. Gazalia</td>
<td>10. Sapmara jhiri</td>
<td>188.00</td>
<td>47.08</td>
<td>3.50</td>
<td>3.75</td>
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<td></td>
<td>7. Choykkhong</td>
<td>11. Naya para</td>
<td>276.00</td>
<td>134.06</td>
<td>2.25</td>
<td>2.60</td>
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<tr>
<td>Total</td>
<td></td>
<td></td>
<td><strong>1309.47</strong></td>
<td><strong>617.31</strong></td>
<td><strong>7.8</strong></td>
<td><strong>10.95</strong></td>
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<td>Kushtia</td>
<td>8. Rafaetpur</td>
<td>12. Bheramara</td>
<td>380.05</td>
<td>185.2</td>
<td>5.6</td>
<td>7.96</td>
</tr>
<tr>
<td></td>
<td>14. Protabpur</td>
<td>262.01</td>
<td>205.13</td>
<td>-</td>
<td>2.27</td>
<td></td>
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<tr>
<td></td>
<td>10. Chatian</td>
<td>15. Chatian</td>
<td>640.11</td>
<td>185.05</td>
<td>7.51</td>
<td>4.89</td>
</tr>
<tr>
<td></td>
<td>11. Fulbaria</td>
<td>16. Kachuadaha</td>
<td>204.94</td>
<td>125.47</td>
<td>4.35</td>
<td>5.09</td>
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<td></td>
<td>17. Tilkandra</td>
<td>210.07</td>
<td>178.26</td>
<td>-</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td><strong>1986.43</strong></td>
<td><strong>1055.42</strong></td>
<td><strong>20.54</strong></td>
<td><strong>27.26</strong></td>
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<tr>
<td>G Total</td>
<td></td>
<td></td>
<td><strong>4621.85</strong></td>
<td><strong>2636.89</strong></td>
<td><strong>40.75</strong></td>
<td><strong>58.35</strong></td>
</tr>
</tbody>
</table>

### 6.2 Dissemination

i. **Dissemination Workshop**

<table>
<thead>
<tr>
<th>WORKSHOP</th>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Level</td>
<td>1</td>
<td>-3</td>
<td>4</td>
</tr>
<tr>
<td>Local level</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>
ii. Visual Documentation

<table>
<thead>
<tr>
<th>MEDIA</th>
<th>YEAR 1</th>
<th>YEAR 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photography:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Cox’sbazar &amp; Bandarban</td>
<td>365 photos</td>
<td>417 photos</td>
</tr>
<tr>
<td>Kushlia</td>
<td>496 photos</td>
<td>382 photos</td>
</tr>
<tr>
<td>Video</td>
<td>24 cassettes</td>
<td>27 cassettes</td>
</tr>
<tr>
<td></td>
<td>24 hours</td>
<td>27 hours</td>
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</table>

6.3 Gender Issues

The project aimed at involving women in all aspects of the research.

Table 41: Participation of women in research, imagination, experiment, dissemination meetings and rallies in three districts

<table>
<thead>
<tr>
<th>ACTIVITIES</th>
<th>COX’SBAZAR</th>
<th>BANDARBAN</th>
<th>KUSHTIA</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Farmer</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Researchers</td>
<td>53</td>
<td>17</td>
<td>33</td>
<td>16</td>
</tr>
<tr>
<td>Experiment Group</td>
<td>46</td>
<td>34</td>
<td>41</td>
<td>25</td>
</tr>
<tr>
<td>Imagination Group</td>
<td>98</td>
<td>38</td>
<td>24</td>
<td>11</td>
</tr>
<tr>
<td>Dissemination Meetings</td>
<td>754</td>
<td>330</td>
<td>112</td>
<td>60</td>
</tr>
</tbody>
</table>

Women in the research areas have been participating in various meetings in the villages as well as meetings at the national and local level. Their voices are very concrete with problems and their desire to get out of the problem. The health research also gave women more information and empirical support to talk about illnesses they have been suffering for long time. For the cultivation of food crops women’ mobilization became very effective through the Seed Hut established in the tobacco research villages. It provided a space for women to discuss on the crops which they need for the next crop. Farmers were happy to support women for seed keeping and preferred to have their own seed supply rather than at the market level.
Capacity-building

The project design and the methodology contributed to the capacity building in the following ways:

7.1 Institutional reinforcement and sustainability of the research organization

UBINIG as a research and policy organisation has always been involved in research for campaign and policy advocacy works. The field based action research with institutional support to farmers has enhanced its recognition and acceptability to the farmers as well as to the policy makers. Nayakrishi Andolon – the biodiversity based farming is well-known now with over 300,000 farming families who are actively involved in seed keeping and carrying out chemical-free farming. In research areas, this was initially difficult. But with the establishment of seed huts and seed management through Nayakrishi farmers for food crops made a breakthrough for farmers willing to shift out of tobacco.

The project provided an opportunity to involve farmers in the process of decision making through identifying the potential crop combinations and to make links with the local level agricultural block supervisors for seeds and necessary inputs. Since this phase of the research was more for replication and dissemination, the farmers outside experimental research were also approached and involved. The Institutional approach of the organisation was emphasised and for sustainability of the work, the seed system was developed.

The use of Social Analysis System (SAS2) contributed to the capacity building at the farmers, staff to engage and interact at the public level in order to identify and analyse the problems related to tobacco cultivation and solutions to get out of it. The training provided to the farmers and the staff has been very effective for sustainability of the organisation’s work and particularly continuing the Nayakrishi activities in the research areas. The farmers, particularly the women farmers, felt more confident in articulating their problems and to find out solutions to come out of the desperate situation. However, more research-based actions are required to strengthen the capacity of the farmers.

The health research provided enough information to develop research on a broader scale and provide evidence based analysis about the effects of tobacco cultivation on human health.

The communication tools, particularly publications, videos and photographs became a resource for the organisation to work on this issue.

7.2 Linkages with social organizations and NGOs

The collective approach of Anti-tobacco campaign has gained momentum in Bangladesh. Although tobacco companies are very active in direct and indirect promotion of smoking and consumption of smokeless tobacco; and at the cultivation level trapping the farmers with advance payments and provision of inputs, yet the awareness is also sharpening. More and more information is generated against smoking and consumption of smokeless tobacco, but with UBINIG research tobacco cultivation issues are becoming important part of this campaign.
In the Second phase, two important groups were involved. One is the journalists and another one is the women’s organisations. On the occasion of observing May 31 – the World no Tobacco Day, 2010 an Alliance of women against tobacco was formed. This alliance is called TABINAJ (Tamak birodhi Nari Jote). Women in the tobacco villages are speaking out against health problems they are suffering due to tobacco cultivation.

Besides, relationships have been developed with the forest officer, agricultural officer, Upazilla Nirbahi Officer (UNO) local government representatives, school teachers and students, NGOs, journalists etc. The support to the project activities by broader social groups has been very remarkable.

Project management

8.1 Administration by the research organization

The starting of the project, i.e. April 2009 was a year after the completion of the first phase of the research. During the period 2008-2009 UBINIG managed to maintain relationship with the farmers in the three research areas through Nayakrishi Andolon. The project started in 2009 and the farmers were ready to take up the activities of replication and dissemination as well as continuing the shifting to food production.

The project activities were coordinated in the three areas of Kushtia, Bandarban and Chakaria (Cox’sbazar) managed through two centres located in Kushtia and Chakaria. Information about new areas were also managed from these centres as well as from Dhaka. Mr. Rafiqul Huq Titu, Coordinator of Cox’sbazar centre took the responsibility of supervision of the field activities of all the three areas while Ms. Romela Akhter Rumi, and later on Mujahidul Islam Prince, Coordinator of Kushtia centre looked after the research in Kushtia. The Project Leader Ms. Farida Akhter conducted the research with the Research Team. Mr. Farhad Mazhar, Managing Director of UBINIG, gave required advice and Mr. Palash Baral provided necessary administrative support.

8.2 Scientific management of the project

The team of researchers had social science background with very strong field based experience of working with Nayakrishi farmers. The farmer-researchers were very experienced and knowledgable on seed keeping, mixed cropping and about the environmental aspects. SAS techniques could be used for analysis of the situation. External consultants were hired with short-term assignments for carrying out agro-economic analysis and for health research.

8.3 Technical and other support and administration by IDRC

IDRC feed back questions on the First Interim Report and editing support from Dr. Daniel Buckles was very useful. The visit of Senior Program Specialist, Research for Health Equity Mr. Wardie Leppen and Natacha Lecours, Research Intern Research for International Tobacco Control (RITC) in September 2010 in the project areas was very useful and gave inspiration to the farmers. The discussion with the research team helped in clarifying the objectives of the research and to plan for future.
Recommendations

The second phase of the project "From Tobacco to Food Production: Consolidation, Dissemination and Policy Advocacy (Bangladesh)" during 2009 - 2011 was conducted at a very crucial time of the Anti-Tobacco campaign in Bangladesh. Firstly, it was the time when the amendment of ‘The SMOKING AND TOBACCO PRODUCTS USAGE (CONTROL) ACT, 2005’ was being discussed among the policy makers and among the Anti-smoking campaign groups. Among them very few were concerned about Article 12 which dealt with the issue of alternative to tobacco cultivation. There were also very little discussion on the occupational health of tobacco farmers and workers engaged in tobacco farming.

Secondly, because the tobacco companies could show a good performance by paying high Taxes to the government, there were no regulations imposed on tobacco companies extending from one area to the other and using the food crop land for tobacco cultivation. During the years 2008 to 2010 tobacco cultivation extended to more areas and it was only UBINIG field based research which could challenge with facts that tobacco cultivation is a serious threat to food production.

The first phase of the project (2006 – 2008) identified economic, social and technical constraints which helped to the effective design of programs and activities by the tobacco producing communities that could be implemented by farmers themselves and would be of interest and of use to policy makers in Bangladesh. Therefore, the first phase of the project has shown very effective results and has generated interest and enthusiasm among the tobacco farmers seeking ways for transition from tobacco to food production. After a gap of one year, the second phase was started for consolidation, dissemination and policy advocacy. The two years (2009-2011) of the project was very significant in dealing with policy issues at local and national level. In the following we shall present recommendations both on the basis of the first phase as well as second phase of the research. These are the following:

- **Consolidate seed system and institutional linkage:** In the first phase it was recommended that there is a need for further strengthening and consolidating the local seed distribution system to provide farmers with ongoing and independent access to seed of alternative food crops. Nayakrishi Seed Network through the supply of seeds from the Community Seed Wealth Centres at the centre level and establishment of Seed Huts at the village level proved very effective. Along with the use of local seeds, the farmers need institutional support for training for making compost (as an alternative to chemical fertilizers) and mixed cropping (for soil nutrient and pest management) and marketing support to the farmers. UBINIG will have to continue to provide farmers with seed through the Nayakrishi farmers’ network, and support local seed producers in the research sites. Therefore further research and action programme of developing a strong seed management system and marketing research is recommended.

- **Consolidate engagement with strategic and influential actors:** Following the findings of the research of the first phase, UBINIG actively engaged with strategic and influential actors at the local and national level in the second phase. It was found that except the Company “card holders” (those who have special arrangements with tobacco companies), other tobacco farmers were willing to find a way to shift to food production as
they do not have any obligation to the company. Also due to restrictions imposed by government on receiving fertilizers at subsidised rate and restrictions on loans the ‘non-card’ tobacco farmers are finding it difficult to take risk to continue tobacco farming. The second phase research showed clearly how the land occupied under tobacco affects food production for the whole year. Therefore all other farmers are interested in taking up crop production plan, with the notion developed in the research as ‘Transition and Substitute crops’.

- **Action programmes to gradually stop tobacco cultivation:** The assessment of crops in comparison with tobacco showed that tobacco is not only harmful and threat to food production but also less profitable with high cost of production and hard labour. It is recommended that the government, the Department of Agricultural Extension (DAE), the crop research institutions, the NGO’s, should have a concerted policy and action programme in the medium and long run to regulate and gradually stop production of tobacco.

- **Collaboration with crop research institutes:** UBINIG can collaborate with crop research institutions of Bangladesh and undertake research for developing competitive rabi crops/technologies for the tobacco growing areas. Considering the high market price of high food value rabi crops such as pulses, beans, peas, oil seeds, spices and vegetables more crop combinations (multiple cropping) including those types of rabi crops should be trialed by the UBINIG research team at the intensive tobacco growing areas of Bangladesh.

- **Future research on crops:** The research is need not only multiple rabi crops combination but also round the year food crops based cropping pattern should be agro-economically evaluated against tobacco based cropping pattern at farm level. Therefore the research on crops should be continued with more emphasis on the year round cropping pattern.

- **Marketing** of agricultural products including rice, pulses, vegetables, etc. is a problem in the village level for lack of transport. The growers in the village level carry their produce to the union level market. These markets are dependent on the middlemen. The whole sale buyers determine the price of the commodities. The farmers have to take whatever the price fixed by the middlemen buyers. Sometimes, surplus crop production brings less return because of low price at the selling point. On the other hand, tobacco is also buyer dependent and the price is unilaterally fixed by the company agents at the buying houses; but it gives an impression of a guaranteed marketing. Thus it appears a pertinent problem for the food crops growers to face serious hurdle in comparison to marketing of tobacco. The marketing of food crops need further study with developing an institutional support along with seed system.

- **Documenting** the loss of plants including herb, shrub and trees in these regions has been done but enough evidence is there to establish the loss of PGR due to the need for firewood for curing of the leaves. But in order to develop a policy against use of trees for curing and regulations by the forest department more information is needed. Also for regenerating the plants for re-establishment of the species in their original habitat. The information collected in the two phases of the research needs to be consolidated with enough information to involve policy makers and the community to take action. In both phases of the research, it was evident that the farmers in Cox’sbazar and
Bandarban have lost the seeds of the local varieties of crops that used to be
grown before the introduction of tobacco cultivation. The physical structure
and chemical properties of soil have been badly affected by cultivation of
tobacco. Further research also needs to be done on the impact of livestock, fish
population, cultivated and uncultivated plants as these constitute the food
sources of the people. The participatory research appears to make headway for
re-establishment of the original environment. But it needs constant pursuance
in collaboration with farmers and other stakeholders.

➢ **The tenancy system** as revealed from the two phases of the study on tobacco
that it is a very complex but very important issue for policy changes in favour
of protecting land from aggression of tobacco. At present the landowners lease
out the land for a certain period of time, particularly in Bandarban, so the
destruction of soil fertility does not concern the farmers as it does not belong to
them. The small farmers who grow tobacco on their own land find themselves
helpless if the surrounding land has tobacco cultivation. Tobacco is also grown
government Khas land without any restriction. The companies make a link
with the powerful landowning class of the village and make sure that tobacco
is cultivated despite its harmful effects. The land management system deserves
further investigation in order to making proper planning which needs focussed
study. In terms of policy, the Ministry of Land can ensure that the land suitable
for food production should be restricted against tobacco production and also
protect the government Khas land from tobacco production.

➢ **River Matamuhuri** is one of the rivers that originated within the political
boundary of Bangladesh and created a fabulous environmental and ecological
complex. It has a pivotal role in the social, cultural and economical life of the
peoples living in the basin. The upstream of the river bank of Matamuhuri is
entirely taken away by the tobacco companies to grow tobacco. The whole of
the banks on two sides of the upstream (80km) is now taken over by the
tobacco cultivation causing serious hazard to the life and ecology of the river.
Chakaria could be the most important productive base of Bangladesh if these
resources were efficiently used. Every year there is fresh siltation by seasonal
flooding. This area has the potential for growing huge quantities of vegetables.
Unfortunately, this basin, especially Ali Kadam and Lama have been occupied
for tobacco production. The tobacco companies have made best use of the
opportunity. Huge quantities of chemical fertilizer and pesticides are used for
tobacco production. The poisonous residues of these chemicals come down
with the rain water and pollute the water of Matamuhuri. The aquatic
resources including fish are badly affected by the poisons. Although in the
second phase of the study more information on river Matamuhuri was
collected but for policy changes more research needs to be done for policy
advocacy.

➢ **Adibashi community:** In the first phase of the study, the impact of tobacco
cultivation on the indigenous communities was mentioned as tobacco
production which was concentrated in the downstream plain land areas of
Matamuhuri is being furthered moved up to the hill areas and into deep forest
areas of Bandarban. Tobacco cultivation is also extending into other districts of
Chittagong Hill Tracts such as Khagrachari and Rangamati. The Adibashi
Marma, Muru, Chakma inhabit these areas. These communities are already
vulnerable and they are now being motivated to cultivate tobacco in place of
jhum cultivation of food crops. This is a direct threat
to the food security of the Adibashi community. The year 2011 is declared as
the year of forest by United Nation Environment Programme (UNEP). The
Forest Law is being formulated which is being opposed by the Adibashi
communities in the CHT. This is a very good timing to raise the issues of
deforestation by tobacco cultivation.

- **Women:** Women and children are severely affected by lack of nutritious food
in the family, lack of fruit trees in their homestead and also due to lack of
livestock and poultry keeping. Excessive use of pesticides prevents poultry
keeping, and also collection of fodder for the cows. The uncultivated sources of
food are depleting leaving the poorer families dependent only on cash to buy
food. Women are not attracted by the ‘cash’ earned after selling the tobacco
leaves in April-May. What they see is that this money goes back to the
company for paying debts, to the doctor for treatment and for some luxury
goods for consumption of men in the family such as mobile phone, motor cycle
etc. After getting good amount of cash money, some tobacco growers build
their houses with bricks, but hardly are they able to put cement plaster on
them. Women’s labour as family labour is not counted, but her labour is very
much crucial at the time of curing. Women spend sleepless night for over 70
hours at stretch to make sure that the leaf curing is perfect for grades to be
good. After selling of the leaves, women become vulnerable for unhappy
family situation because of the loss faced by the head of the family from the
company. Women have felt redundant in terms of using their knowledge in
farming, seed keeping, post harvesting works and overall involvement in food
production. A gender related study on women and tobacco cultivation can be
conducted.

- **Water:** Tobacco production is closely related with availability of water. Not
only tobacco production utilizes water but also pollutes water in every stage of
production. If tobacco production could be stopped, it would solve both food
securities, ensure availability of pure drinking water and supply water for
other productive purposes. In the two phases of the research information is
generated but needs consolidation. These observations call for further research
involving water. The water used for irrigation of tobacco can effectively be
used for fish production.

- **Health impacts:** In the second phase of the study the occupational health
impact is well documented and serious health concerns are revealed. However,
more study including other areas and workers in other tobacco product
factories can be done. Health issues are vital for the law and particularly for the
Ministry of Health to take up more seriously. In the period of consolidation,
emphasis was given to collect information on health aspects related to tobacco
farming with particular emphasis on women, children and adult men. The
companies must be made accountable for creating public health hazard. The
demand for special allocation for treatment of patients affected by diseases
related with tobacco cultivation is raised in the tobacco growing areas. These
provide good basis for awareness raising as well as policy changes. But for
advocacy more coverage of areas are needed.

- **SAS Training component** has been very useful in the first and second phase of
the study. The training on SAS can be continued to equip farmers and activists
to engage in participatory analysis of problems and actions for solutions. We
propose to invite Carleton University to be involved and also other SAS
partners in the region.

- **Finally, it is recommended** that a comprehensive policy on tobacco control in general and control tobacco cultivation in particular must be taken up by the government. As a part of global movement against usage of products, Bangladesh government as well as the groups working on tobacco control must incorporate the issues of harmful impact of tobacco cultivation on environment, food production and human health. It is not only the Ministry of Health that can take decision on controlling tobacco cultivation, but the Ministry of Finance, Ministry of Environment and Ministry of Agriculture must act together to regulate tobacco cultivation. UBINIG needs to continue the policy advocacy work at the government level.