
Livelihoods of Forest-dependent People in Kaptai National Park

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Abstract

Forests provide both a home and livelihood for people living in and around them and serve as vital safety nets for the rural poor. In Bangladesh, forest resources are being depleted at alarming rates due to over exploitation. Local communities practice swidden farming (jhum) in hill districts in Bangladesh and survive lean periods by collecting wild fruits, leaves, and tubers from forest reserves. In response to growing pressures on forests, in 2009 the Bangladesh Forest Department initiated a co-management program with the assistance of the Integrated Protected Area and Co-Management (IPAC) Project. In this paper I examine the livelihood patterns and needs of residents in two villages (Bangchari and Kamillochari) in Kaptai National Park in order to highlight how conservation can be linked to the welfare of local communities. I argue that local residents are fully dependent on the park and are therefore excited to participate in co-management programs.

Introduction

Forests provide both a home and livelihood for people living in and around them, supplying wild foods, fuelwood, medicinal plants, and materials for building and other purposes. Forests serve as vital safety nets that help rural people sustain their livelihoods. In Bangladesh forest resources are being depleted at alarming rates due to over exploitation. Although ten to twelve percent of the total national land in Bangladesh is designated as forest, tree cover accounts for only five to seven percent according to one estimate (Haque 1998). However, it should be noted that there is controversy among organizations over estimates concerning the scale of forest area and rates of deforestation. According to the Forest Policy of 1992 the national target is to achieve a forest cover of 20% by 2015.

In many tropical countries swidden farming (*jhum*) is widely practiced even though it remains controversial among conservationists and others (Delang 2006). Swiddening, often referred to as "slash-and-burn", is an ancient farming practice. In Bangladesh, swidden farming is practiced in the three hill districts of Rangamati, Bandarban, and Khagrachari. Swidden farmers cut down trees, shrubs and herbs in a selected area, burn plant materials after they dry, and then sow seeds after the first rains fall. After cropping a particular area for a time it is left fallow for several years. When first established, the Forest Department (FD) allowed villagers to use swidden techniques in the reserve forests. However, since the creation of the Forest Act of 1927 (amended in 1990) swidden farming in the reserve forests has been prohibited in Bangladesh. However, the livelihood strategies of forest dwellers still revolve

around this traditional farming system and swiddening continues at low levels in reserve forest areas where the FD unofficially allows some villagers to engage in the practice in exchange for forest protection services.

In addition, many local communities survive during the annual lean period from June to August by collecting wild fruits, leaves, and tubers from core areas of forest reserves. Prior to the management of these areas by the FD, forest villagers collected fuelwood, wild foods and some non-timber forest products (NTFP). However, nowadays many people go to the forests to cut wood illegally. This has caused conflict between forest managers and local people, which has had two negative effects: forest resources have become depleted and forest dwellers have lost access to essential resources.

As a response to population pressures, a shortage of FD staff members, and weak forest management practices, the FD initiated a co-management program in Kaptai National Park in 2009 with the assistance of the Integrated Protected Area and Co-Management (IPAC) Project. The goals of this program are to foster respect for forest peoples, their knowledge of the forest, and their inherent rights to use forest land, and to incorporate these elements into forest resource management. In addition, an experimental participatory agar (*Aquilaria agallocha*) plantation was started in the buffer area of the park in 2008. This project sought to replace traditional swidden practices with legal forest management practices.

In this paper I examine the livelihood patterns and needs of residents in two villages (Bangchari and Kamillochari) in Kaptai National Park in order to offer insights into the livelihood needs of forest people and show how conservation can be linked with people's livelihoods.

Background

Chittagong Hill Tracts (CHT) comprises an area of 13,180 square kilometers in southeastern Bangladesh. CHT is a unique part of the country both in terms of its landscape and people. It is Bangladesh's only hilly terrain and is home to the country's largest concentration of ethnic people, with thirteen distinct groups. About fifty percent of the population belongs to non-Bengali ethnic groups, mostly migrants from Myanmar and Tripura State in India. Kaptai National Park is situated in Rangamati District and is managed under CHT South Forest Division.

Administratively Kaptai National Park is divided into two ranges: Kaptai Range and Karnaphully Range. In the Kaptai Range there are two big hills, Rampahar and Sitapahar. Some natural forest remains in Sitapahar, but the rest of the Kaptai Range is covered with planted forest. Prior to the designation of Kaptai National Park the area was known as Sitapahar Reserve. The park was established by gazette order in 1999. Its area is 5,465 hectares (13,498 acres) and it harbors many plant and animal species. Kaptai National Park is now treated as an important protected area in the country (Figure 1). Historically, Kaptai National Park is famous as the place where the first teak plantation was established in Bangladesh in 1871.

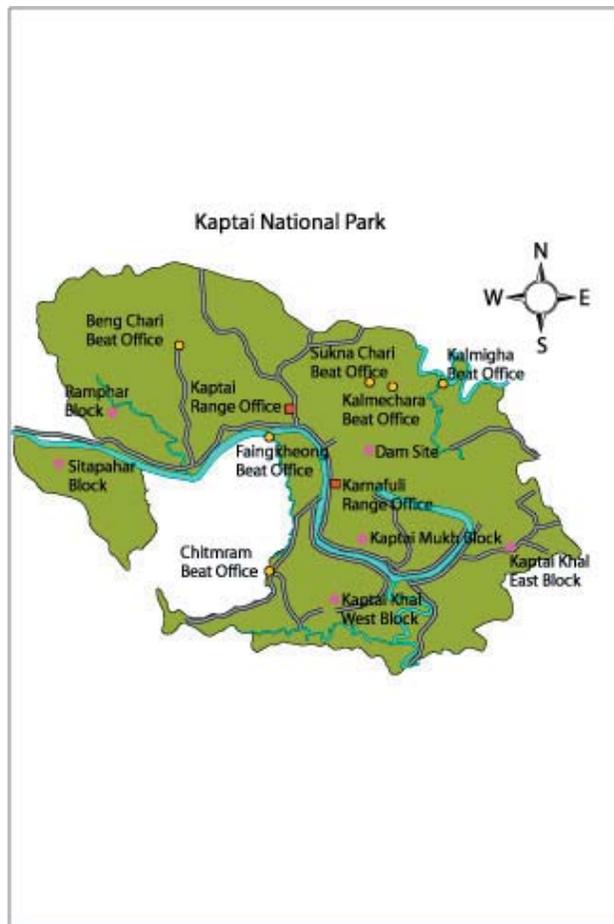


Fig. 1: Map of Kaptai National Park

The topography of Kaptai National Park is undulating, with elevations ranging from 30 to 180 meters. The park is located within a mixed evergreen forest biographic zone and numerous streams also flow through it (Khan and Monirul 2007). Notable animals include the Asian elephant (*Elephas maximus*), barking deer (*Muntiacus muntjak*), hoolock gibbon (*Hylobates hoolock*), wild boar (*Sus scrofa*), and sambar (*Cervus unicolor*). Kaptai National Park is home to the second largest population of hoolock gibbons in the country after Lawachara National Park, at present there are forty Hoolock Gibbons in the park (IPAC 2009). Tree species include garjan (*Dipterocarpus sp.*), chapalish (*Artocarpus chaplasha*), banshpata (*Podocarpus nerifolia*), civit (*Swintonia floribunda*), gutgutia (*Fortium serratum*), and toon (*Cedrella toona*).

The livelihoods of many people in Kaptai National Park area are closely connected to forests. There are about 35 villages in and around the park, with nine in the immediate area next to the park and two inside the park boundary itself. Village

populations are comprised of mixed ethnic groups including Bengalis, Chakma, Marma, and Tanchangya. Villages located outside of the park are mostly inhabited by Bengalis, while residents of the two interior villages are mostly non-Bengali. The two interior villages, Bangchari and Kalabuniapara, have a total population of about five hundred people. These peoples are landless, although some of them practice cultivation on occupied forest lands. In the minds of FD staff members the land-use practices of these communities are undesirable because swidden cultivation and the indiscriminate collection of forest resources reduce biodiversity.

This study focuses on one of the villages inside Kaptai National Park (Bangchari) and one village on the park edge (Kamillachari). In Kamillachari some people maintain their livelihoods by catching fish and cultivating their own farmland. Many people in Kamillachari, however, are landless and therefore practice swiddening in the buffer area of Kaptai National Park.

Communities in the Chittagong Hill Tracts have traditional knowledge of mixed cropping. They can identify medicinal and edible plants and they have knowledge about fishing. Some local people use integrated farming systems that remain successful. In fiscal year 2007-2008 the FD introduced a participatory agar plantation in the buffer area of the park. The plantation was purposely placed in a traditional swidden area as part of an effort to encourage swidden practitioners settle and switch to agroforestry. Approximately one hundred tribal people actively participated in the establishment of the seventy three hectare plantation. Local people were allowed to intersperse agricultural crops along with agar seedlings. By participating in the plantation program and implementing a collaborative forest resources management system these communities are reasserting their inherent rights to use natural resources and are now participating in natural resource conservation activities.

Methods

Bangchari has a total population of 200 people and 84 households. Most inhabitants belong to the Marma tribe, but two households are Tanchangya. Bangchari village is comprised of five scattered hamlets called *paras*. The number of households per hamlet is summarized in Table 1.

Table 1: Number of households in each hamlet of Bangchari Village

Hamlet name	Alternate name	Number of households
Andalachara	Keranighona	11
Kaplachara	Headmanpara	14
Rohahongpara	Puranpara	22
Bogachari	-	10
Kargochara	Notunpara	27

Kamillachari consist of three hamlets inhabited by Chakma and Tanchangya people. There are eighty-one households in the village and the total population is about 250 people of which approximately fifty are Tanchangya.

For this study I used a combination of qualitative and quantitative social science methods. I conducted two informal group interviews (approximately fifteen people per group) with forest resource users in both villages. In Bangchhari, I conducted a focus group discussion with people who depend on FD lands for their subsistence and I also conducted a focus group discussion with FD staff members. In Kamillachari, I conducted two focus group discussions, one with fishers and the other with land owners. I conducted key informant interviews with three people in Bangchhari and two people in Kamillachari.

The village headmen in both villages helped me to rank all the households in each village according to income. I then used stratified random sampling to select households for interviews. I conducted interviews in twenty five percent of village households (21 in Bangchhari and 20 in Kamillachari). Interviews lasted approximately 1 to 1.5 hours and I interviewed either males or females depending on who was available. I observed that some respondents who had profound knowledge of their village and its assets played active roles in the community. In each village I created a community map with the help of villagers and walked a transect to validate the maps and observe different livelihood activities. During the transect I associated groups of households with particular livelihood activities.

Results

Farmers in both Bangchhari and Kamillachari have swidden fields, paddy fields, and homestead gardens. Bangchhari is located within Kaptai National Park and all its lands are owned by the FD, but villagers have usufruct rights and use land for various purposes. The FD has arrangements for allotting specific forest lands to farmers from Bangchhari for swiddening. When the FD identifies areas to be reforested, farmers from Bangchhari cut down secondary trees and brush to cultivate crops such as rain-fed rice, maize, pepper, eggplant, pumpkin, turmeric, and ginger. After several years of crop cultivation, villagers assist FD personnel with replanting the land as an FD plantation. The FD calls this land-use system swidden agriculture, but elsewhere it is also known as a form of *taungya* forestry. In Bangchhari ninety four percent of households are dependent on this type of agriculture. However, villagers are now facing land scarcity because the FD is planting fewer plantations in the Bangchhari area.

In contrast, Kamillachari is located on the edge of Kaptai National Park and farmers from Kamillachari do not have legal access to use park land for swiddening. FD personnel believe that farmers from Kamillachari destroy plantations by illegally clearing them for swiddening. This causes conflict between Kamillachari villagers and park staff. I found that sixty two percent of households in Kamillachari depend on swiddening to support their livelihoods. As in Bangchhari, farmers plant upland rice, maize, pepper, eggplant, pumpkin, turmeric, and ginger in their swidden fields.

According to key informants there are 102.4 acres of cultivable paddy fields in Bangchari village. Approximately sixty four percent of households are dependent on paddy farming to provide a six to seven months supply of rice. After harvest most paddy fields are fallowed because there is insufficient water for a second crop. In Kamillachari there are 150.4 acres of cultivable paddy field and approximately forty three percent of households own paddy lands. Appendix 1 is a crop calendar for the two villages.

My study shows that currently as many as eighty percent of households in Bangchari and fifty percent in Kamillachari have gardens near their homes where they grow vegetables such as beans, pumpkins, greens (*puishak*), as well as fruit trees such as lemons, guava, bananas, mangos, and jackfruit. Both swidden fields and home gardens are frequently damaged by wild elephants, boars, monkeys, and hoolock gibbons. Villagers in Kamillachari faced attacks by wild elephants on their homes between August and October 2009. Informants suggested that four percent of households were severely affected, with elephants destroying all assets including homes. Farmers must guard their agricultural crops diligently from wild animals.

I found that approximately thirty one percent of households in Bangchari cultivate coriander as a shade tolerant crop in the forest. They plant coriander leaves in the month of *Bhadra* (mid-August to mid-September) and harvest in the month of *Baishak* (mid-April to mid-May). Coriander is a very profitable crop for villagers. None of the villagers in Kamillachari cultivate coriander leaves on their swidden or other farm land (see appendix 1).

Approximately thirty six percent of households in Bangchari and fifty seven percent of households in Kamillachari have no agricultural land. The landless in both villages collect and sell fuelwood and other NTFPs from neighboring forests. Besides these activities they also earn money from wage labor and rearing cows, pigs and poultry. Approximately seventeen percent of households raise cattle, which are released into forests to graze and sold in markets after they are fattened. Many landless people in Bangchari (but not Kamillachari) also distill and sell alcohol. Bangchari villagers also face the problem of having only one deep tube well; as a consequence many villagers frequently suffer from waterborne diseases for lack of fresh water

People living in forest environments and practicing hunting, collecting, and swidden agriculture draw heavily on forest products not only for subsistence but also for income. Forest related incomes include not only the typical NTFPs but also crops grown in swidden fields and livestock grazed in the forests (Shephard, Arnold and Bass 1999). In Bangchari the main sources of subsistence and income include swiddening, paddy farming, home gardening, and livestock raising. Landless households earn money from collecting and selling NTFPs and day-labor opportunities. Villagers in Kamillachari earn their primary livelihood from swiddening as well as fishing in Kaptai Lake. Other sources of income include wage labor and selling broomsticks (made using *Thysanolaena maxima*) in the winter season. In both villages people spend most of their cash income purchasing food, cloth, health care services, and agriculture-related products. In Kamillachari fishers

also purchase fishing equipment. Table 2 summarizes the various subsistence and income activities people engage in throughout the year. Figure 2 compares the total amount of assets available in each village.

Table 2: Calendar of subsistence and income activities in Bangchhari and Kamillachari village

	January	February	March	April	May	June	July	August	September	October	November	December	Number of households (Bangchhari)	Number of households (Kamillachari)
Swidden cultivation	■	■	■	■				■	■	■	■	■	79	50
Fishing	■	■	■	■	■				■	■	■	■	--	35
Cow rearing	■	■	■	■	■	■	■	■	■	■	■	■	51	7
Pig rearing	■	■	■	■	■	■	■	■	■	■	■	■	65	3
Poultry rearing	■	■	■	■	■	■	■	■	■	■	■	■	84	81
Small Trade	■	■	■	■	■	■	■	■	■	■	■	■	4	15
Farming on own land	■	■	■	■	■	■	■	■	■	■	■	■	9	35
Cloth making	■	■	■							■	■	■	--	70
Fuelwood collection	■	■	■	■	■	■	■	■	■	■	■	■	81	--
Government job	■	■	■	■	■	■	■	■	■	■	■	■	3	--

Major NGOs, including the Indigenous Development Federation (IDF), Bangladesh Rural Advancement Committee (BRAC), the Association of Social Advancement (ASA), and Grameen Bank, operate in Bangchhari and Kamillachari villages. According to key informants, ten households in Bangchhari and eight in Kamillachari have received credit from ASA. In addition ten households in Kamillachari have received credit from BRAC and fifty five households from UNDP. In addition, fifty five households in Kamillachari have taken credit from the Bangladesh Rural Development Board (BRDB).

In 2008 the FD started an experimental agar plantation in the buffer area of Kaptai National Park to help resolve conflicts over swiddening and to provide economic support for people highly dependent on park resources. Provision was provided by the FD for local people to practice intercropping until the agar canopy became too

thick for field crops to grow. In addition, participating farmers were to receive forty five percent of income earned from the agar trees.

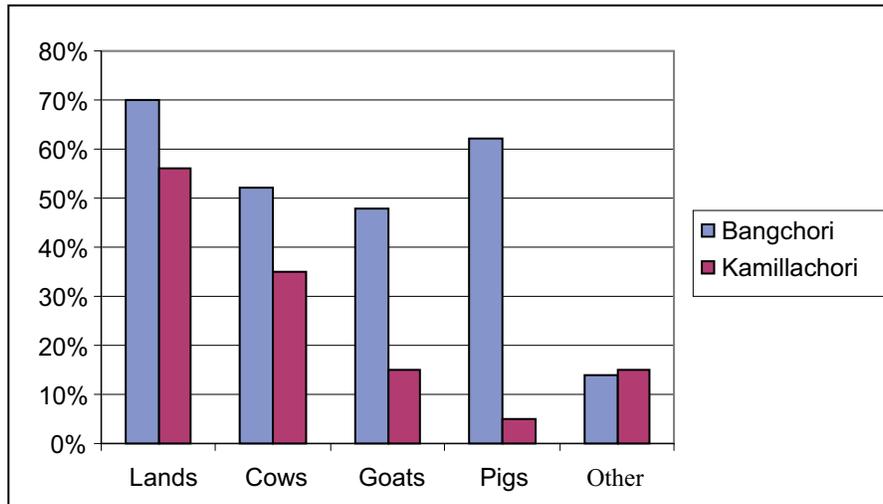


Figure 2: Comparative households assets found in Bangchari and Kamillachari

I found that approximately eleven percent of households in Kamillachari directly benefited from intercropping paddy, ginger, turmeric, maize and other agricultural crops with the agar seedlings. Another fifty seven percent of Kamillachari and twenty four percent of Bangchari households work as wage laborers in the agar plantation (see Table 3).

Table 3: Percent of households receiving benefits from agar plantation in Bangchari and Kamillachari villages

Benefit received	Percent of households, Bangchari	Percent of households, Kamillachari
Intercropping (paddy/maize/vegetables)	-	11
Paddy straw	-	28
Wage labor	24	57

The total contribution of forests to livelihoods is difficult to quantify. The amount of forest products collected by forest dependent households varies according to season, access, and available alternative options (Warner 2000). Forests provide fuelwood and housing materials for all households in both villages irrespective of season. Most households in Bangchari mitigate the lean period (June to August) by collecting wild vegetables and fruits from forest (see appendix-1). In Kamillachari approximately thirty nine percent of farm households are dependent on forests for wild foods during this season. Fishing is also banned in Kaptai Lake during this lean period so

approximately forty three percent of fisher households in Kamillachari also depend on park resources as a source of food during this time. Villagers in Bangchhari suggested that food insecurity has increased overtime with the degradation of resources in Kaptai National Park.

Looking comparatively at both villages, only about twenty five percent of the villagers in Kamillachari are not heavily dependent on forest resources. Table 4 shows the percent of households in each village that collect various wild foods in the forest.

Table 4: Percentage of households collecting and types of wild foods collected during the wet season.

Resource	Local name	Scientific name	Extent	households collecting, Bangchhari (%)	households collecting, Kamillachari (%)
Leafy vegetables	Chingi shak	<i>Laasia spinosa</i>	More available	100%	50%
	Tara shak	<i>Alpinia nigra</i>	More available	100%	50%
	Chikon shak	<i>Homalomena aromatica</i>	More available	100%	50%
	Dheki shak	<i>Dicranopteris linearis</i>	More available	100%	50%
	Thankuni shak	<i>Clitoria ternatea</i>	More available	30-40%	20-30%
	Ban kochu (Leaf, stem and corm)	<i>Colocasia esculenta</i> (taro)	More available	100%	50-60%
	Kalar mocha and Thor	<i>Musa ornate</i> (wild banana)	Less available	30-40%	20%
	Moricha Lata(Chui jhal)	<i>Piper chaba</i>	Less available	30-40%	30%
Bamboo Shoots	Bash korol	<i>Melocanna baccifera</i>	Moderately available	100%	100%
Jungle Fruits	Jog dumur	<i>Ficus racemosa</i>	More available	100%	100%
	Chalta	<i>Dillenia indica</i>	Less available	86%	20-30%
	Gutgutia Fruit	<i>Fortium serrattum</i>	Less available	30-40%	20-30%
	Khana Fruits	<i>Oroxylum indicum</i>	Less available	30-40%	20%

The FD and IPAC have recently introduced co-management programs in Kaptai National Park to solicit the participation of local people in park management. Eight people each from Bangchhari and Kamillachari villages are members of the co-

management council (CMC) for the park. The CMC considers appropriate alternative Income Generating Activities (IGA) for these villages. In this study I found that approximately 70 percent of the population of Bangchari wants to culture fish in low-lying lands (*headmanghona*), and 30 percent of the population wants to establish tourist facilities for income generation. People also want to plant fruit trees in their home gardens and establish tree nurseries. In Kamillachari 12 percent of the population wants to culture fishing in streams (*chara*) inside the agar plantation. They also want to collect entry fees from tourists coming to see the agar plantation.



Plate 1: Tourists watching a tribal dance



Plate 2: A *chara* inside

Recommendations

In focus group discussions people in the two villages suggested alternative income generating activities that they are interested in exploring for improving their livelihoods. In Bangchari these included planting a fruit orchard in the FD participatory plantation area or other areas allotted by the FD; creating tree nurseries on areas allotted by the FD; co-operative fish culture in low-lying lands (*headmanghona*); and ecotourism.

Planting fruit yielding trees in the forests is good for both tree cover and people's livelihoods. It will provide a supplementary source of income and a safety net in times of crop failure, unemployment, or other hardships.

Regarding eco-tourism, an ethnic museum could be established in Bangchari reflecting local culture and traditions. An autumn celebration could be held in the forest with tourists encouraged to participate in a "Tourist Tree Planting Center". Opportunities could be provided for people who want to taste traditional tribal foods to dine in the homes of community members. Tourists of course would pay for enjoying these activities. Young people could be trained to be eco-tour guides. Others may want to develop an eco rickshaw business for carrying tourists from Kaptai-Chittagong road (located near the Bangchari Beat office) to the village.

Mushroom cultivation is now popular in the community. Training and assistance could be provided for mushroom cultivation that could become a source of income and food for the community. Building and installing improved stoves (*chullas*) could also become a source of income for some people if they received training on making and installing them. In addition these stoves would reduce the amount of fuelwood used and improve women's health by minimizing the amount of smoke they inhale during cooking.

There are many low-lying paddy fields inside the Bangchari Beat Office. These lands are not used for seven months (December to June) after the paddies are harvested. Multipurpose use of these fields should be developed by providing a source of water during the dry season.



Plate 3: A fallow paddy field inside Bangchari



Plate 4: A traditional swidden hut (*jhum ghar*)

In Kamillachari people expressed a desire to plant a fruit orchard at the participatory agar plantation area; create tree seedling nurseries on their own farming lands; do bamboo crafts; do ecotourism activities; and start co-operative fish cultivation in low-lying streams inside the FD owned participatory agar plantation.

A tourist shop could be established along the New Rangamati Kaptai road. Chakma and Tanchangya women generally weave their own clothes. They could generate income from the weaving and selling of cloth. In addition, many tourists go to their swidden huts (*jhum ghar*) to observe the daily lives of villagers, so this could become a means of earning money from tourists by charging money for these visits. People would pay to eat traditional tribal foods with the community people and to stay at the *jhum ghars* during the day.



Plate 5: A Tribal woman weaving cloth in Kamillachari

Conclusion

The main conclusion from this study is that the majority of people in Bangchhari are still dependent on swidden agriculture. The people of Bangchhari are fully dependent on the forests of the Kaptai National Park for shelter, fodder, and fuelwood. As the FD reduces the amount of land it manages under plantations, it also reduces the amount available for swiddening, making the livelihoods of Bangchhari villagers less sustainable. This has caused growing conflict between the FD and Bangchhari villagers. Though some households can meet their rice needs from cultivating their low-lying paddy fields, respondents say they would like to cultivate several crops per year. On the other hand, villagers without access to low-lying paddy fields cannot maintain their livelihoods.

In the past, people from Kamillachori village practiced swiddening in the buffer area of the park that is now part of the experimental agar plantation. A small portion of these people benefited from their participation in FD plantations, but others continued to pursue less sustainable livelihoods. In addition, villagers from Kamillachori also face problems with elephants destroying their homes and fields. For villagers the forests of Kaptai National Park also play important roles in helping them to overcome lean periods.

People in these villages are excited to participate in co-management programs because of opportunities to benefit from alternative income generating activities. As noted above people have begun to identify activities that they think would most benefit them and help provide a more sustainable livelihood.

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Appendix 1

Crop calendar of Bangchhari and Kamillachari village

<i>Baishak</i> (mid-April to mid-May)	Piles slash materials. Plant bananas
<i>Jaishtha</i> (mid-May to mid-June)	Sow paddy. Plant turmeric and ginger
<i>Ashar</i> (mid-June to mid-July)	Weed paddy (first time)
<i>Srabon</i> (mid-July to mid-August)	Weeds paddy (second time)
<i>Bhadra</i> (mid-August to mid-September)	Start paddy cutting
<i>Ashwin</i> (mid-September to mid-October)	Continue paddy cutting
<i>Kartik</i> (mid-October to mid-November)	Complete paddy harvesting
<i>Agrohasan</i> (mid-November to mid-December)	Clean fields for planting turmeric and ginger
<i>Poush</i> (mid-December to mid-January)	Clean fields for planting turmeric and ginger
<i>Magh</i> (mid-January to mid-February)	Start weeding swidden fields and harvest turmeric and ginger
<i>Falgun</i> (mid-February to mid-March)	Continue weeding
<i>Chaitrow</i> (mid-March to mid-April)	Burn dried materials and plant bananas

Appendix 2
List of the indigenous edible vegetables and fruits
collected from Kaptai National Park

Forest Vegetables:

1. Local name: Tara

Tribal name: Tara (Chakma), Chang yangang or Chang a duk (Marma)

Scientific name: *Alpinia nigra* (Gaertn.)

Family: Zingiberaceae

Distribution in the forests: Found in low lying areas, stream banks.

Used part: Inner portion of aerial parts (pith)

Uses: Cooked as vegetables and used in curry for flavoring.

Other uses: Rhizome is considered to be relieves stomach aches, aphrodisiac, tonic, diuretic etc.

2. Local name: Helencha, Malancha

Tribal name: Anlochi or Keckrock shag (Chakma), Tidi dog (Marma)

Scientific name: *Alternanthera philoxeroides* (Mart.)

Family: Amaranthaceae

Distribution in the forests: Found in wet soil, slow moving shallow water

Used parts: Leaves, young twigs

Uses: Cooked as vegetable

3. Local name: Ol kachu

Tribal name: Ol khochu (Chakma), Pring Faing (Marma)

Scientific name: *Amorphophallus paeoniifolius* (Dennst.)

Family: Amaranthaceae

Distribution in the forests: Found in moist places under the shades of trees, forest areas and plantations. It is also commercially cultivated in Chittagong hill tracts.

Used parts: Corm

Uses: As a common tuber cooked as vegetable and sometimes in meat.

Other uses: It is used as an appetizer, relieves stomach aches, and tonic.

Aerial Used part(s) in cholera, diarrhea, kala-zar, neuralgia, bites of poisonous insects etc.

4. Local name: Jangli tulsi

Tribal name: Jangli harinchi, Horinshing (Chakma), Lendaza (Marma),

Harsanga (Tripura), Tunga dana (Tanchangya)

Scientific name: *Anisomeles indica* (L.) Kuntze

Family: Lamiaceae

Used part: Leaves

Uses: The leaves are used as additive and also as flavoring agent also as vegetable with small fishes.

Other uses: The crushed stem is taken for the treatment of childhood illnesses and leaf extracts are taken thrice daily for treatment of fever in children (Chakma).

5. Local name: Kukur sunga

Tribal name: Ambosh (Chakma), Fawma bopong (Marma)

Scientific name: *Blumea lacera* (Bum.f.)

Family: Asteraceae

Distribution in the forests: Occasional along the roadsides and fellow lands.

Used part: Tender shoots

Uses: Young shoots are boiled to remove the bad scent and then cooked as vegetable.

Other use: It is used in medicinal purposes.

6. Local name: Punarnava

Tribal name: Punorva dalok

Scientific name: *Boerhavia diffusa* L.

Family: Nyctaginaceae

Distribution in the forests: Frequent in marginal land.

Used part(s): Young Leaves and stem

Uses: The plant is cooked by the indigenous people as veget

7. Local name: Shimul, Tula gach.

Tribal name: Seme phul /Semain Gach (Chakma), Lapyang bu-pang(Marma)

Scientific name: *Bombax insigne* Wall.

Family: Bombacaceae

Distribution in the forests: Found in forest and village thickets.

Used part: Flower.

Uses: Removing the corolla rest of the flowers are dried in the sun and stored. These storage flowers are used as additive in vegetable. It is also taken as bharta (paste) after boiling.

Other use: Fruits are the source of cotton. Young roots are used as medicine in sexual impotency.

8. Local Name: Chikan bet, Jali Bet.

Tribal name: Moricha (Chakma), Kejune (Marma)

Scientific name: *Calamus guruba* Buch.

Family: Areceaceae

Distribution in the forests: Occasional in hill slopes.

Used parts: Stem pith.

Uses: The spiny skin of young stem of this rattan is peeled off and the inner soft, tender creamy pith is cooked with small shrimp and popular as a delicious menu.

Other use: Use for making furniture, cane-strips for binding edge of bamboo baskets etc.

9. Local name: Thankuni/Thulkuri

Tribal name: Minmini (Chakma), Murong khoya (Marma).

Scientific name: *Centella asiatica* (L.)

Family: Apiaceae.

Distribution in the forests: Occasional in foot hills and wet moist lands.

Used part: Leaves

Uses: Used in salad, Chutney and cooked as leafy vegetable.

Other use: The whole plant is used to treat diarrhea and dysentery.

Family: Chenopodiaceae.

10. Local name: Bathua shak.

Tribal name: Bathwa shak (Chakma), Bra Tho Aa(Marma)

Scientific name: *Chenopodium album* L,

Family: Chenopodiaceae.

Distribution in the forests: Grow in crop fields.

Used parts: Young shoot and leaves.

Uses: Cooked as vegetables with or without small shrimp or available small fishes to make a tasty curry.

Other uses: Leaves are used medicinally in the treatment of hepatic disorders and spleen enlargement, dysentery, piles and also laxative, anathematic.

11. Local name: Tok patha

Tribal name: Mormojjya amile(Chakma), Pong Kryang shi (Marma)

Scientific name: *Cissus repens* Lamk.

Family: Vitaceae

Used parts: Tender stem, leaves

Used as: Young shoots are used in curries. Sometimes used as additive to bring a sour taste especially in fish items.

Other Use: Leaf extracts are taken for fever.

12. Local name: Cingi shak(Marma)

Scientific name: *Laasia spinosa*

Family: Araceae

Used parts: Pith

Uses: Pith is used as vegetable.

13. Local name: Jungle termaric

Scientific name: *Curcuma zeodorii*

Family: Zingiberaceae

Used parts: Rhizome

Used: Rhizome is used as vegetable.

14. Local name: Dheki shak

Scientific name: *Dicranopteris linearis*

Family: Dicranopteraceae

Used parts: Frond

Uses: Frond is used as vegetable.

15. Local name: Chikon shak

Scientific name: *Homalomena aromatica*

Family: Araceae

Distribution in the Forests: Found in moist places under the shades of trees

Used parts: Petiole

Uses: Petiole is used as vegetable.

16. Local name: Moricha Lata (Chui jhal)

Scientific name: *Piper chaba*

Family: Piparaceae

Distribution in the Forests: Found in moist places near the streams.

Used parts: Stem

Uses: Stem is used in vegetable.

17. Local name: Muli bamboo

Scientific name: *Melocanna baccifera*

Family: Poaceae

Used parts: Bamboo shoots

Uses: Bamboo shoots are used as vegetable.

Forests fruits:

1. Local name: Latkan.

Tribal name: *Kusumgula (Chakma)*

Scientific name: *Baccaurea ramiflora* Lour.

Used part: Fruit

Uses: The sour and sweet tasted fruits are edible.

Other uses: The fruits pulp used in vomiting and very useful in diarrhea and high blood pressure.

2. Local name: Khorkoijja bet, Karak bet.

Tribal name: Karath (Chakma)

Scientific name: *Calamus viminalis* Willd.

Family: Arecaceae

Distribution in the forests: Occasional in hill slopes and in secondary forests.

Used part: Fruits.

Uses: Ripe fruit pulps are edible.

Other uses: Stems used for making arrows, baskets, different household item etc.

3. Local name: Makhna shim

Tribal name: Moma shumi (Chakma), Pay- Thak- Shi (Marma).

Scientific name: *Canavalia gladiata* (Jacq.)

Family: Fabaceae

Used part: Fruit

Uses: Fruits are cooked as vegetables.

4. Local name: Tit Begun

Scientific name: *Solanum torvum*

Family: Solanaceae

Used parts: Fruits

Uses: Fruits are used as vegetable.

5. Local name: Khana

Scientific name: *Oroxylum indicum*

Family: Dicranopteraceae

Used parts: Fruits

Uses: Fruits are used as vegetable.

6. Local name: Chapalish

Scientific name: *Artocarpus chaplasha*

Family: Moraceae

Used parts: Fruits, Seeds

Uses: Fruits, Seeds (By the frying) are used as food.