



**USAID** | **SRI LANKA**  
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# MANAGING CONFLICT IN WATERSHEDS OF SRI LANKA

## FINAL REPORT



JANUARY 2005

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# ACRONYMS AND ABBREVIATIONS

<i>anicut</i>	Diversion structure in Sri Lanka to capture streams by diverting water to lateral canals that feed field terraces or small alluvial plains
<i>chena</i>	Shifting cultivation or agriculture
DA	District Authority
DCO	Distributary Canal Organization
DOF	Department of Forestry
DOI	Department of Irrigation
DOW	Department of Wildlife
DS	Divisional Secretary
EIA	Environmental Impact Assessment
JVP	Janatha Vimukthi Peramuna (political party)
LTTE	Liberation Tigers of Tamil Eelam (opposition group)
mm	millimeters
<b>NCP</b>	<b>North Central Province</b>
NGO	Nongovernmental Organization
NRM	Natural Resources Management
NTFP	Non-timber Forest Product
NWSSB	National Water Supply and Sanitation Board
PSI	Pelwatta Sugar Industries
RBEFC	Ridi Bendi Ela Farmers Company
SLFO	System Level Farmers Organization
tank	Small reservoir (from the Portuguese word for reservoir)
USAID	United States Agency for International Development



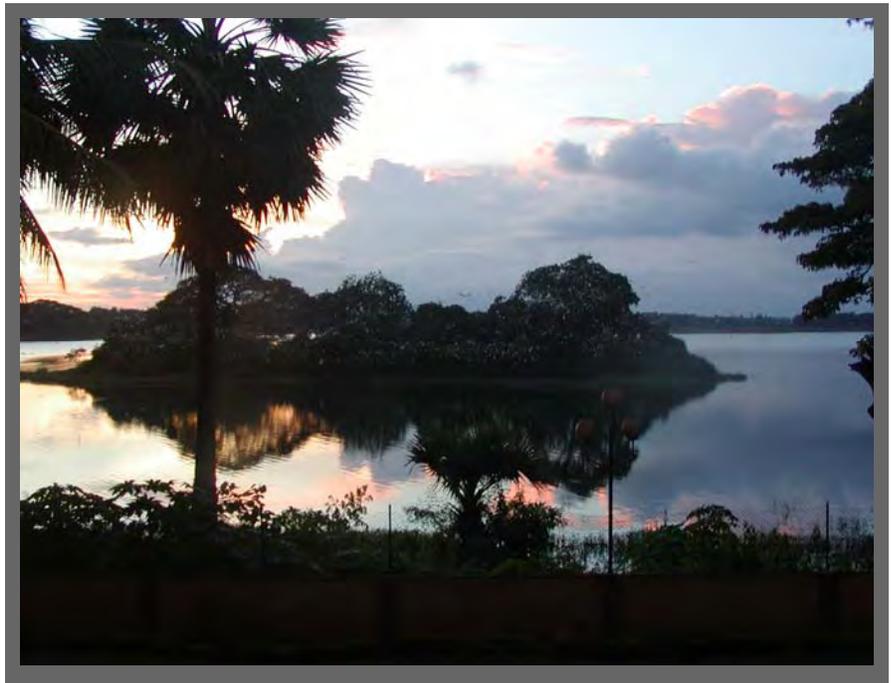
# EXECUTIVE SUMMARY

Sri Lanka has faced two types of conflict that affect natural resources management. In the northern and eastern part of the country, civil war has been waged for most of the last 20 years, and only recently have moves to peace allowed displaced people to return. In the densely populated south of the country, land and water resources are under increasing pressure, and disputes over access to natural resources are increasing. During November 2004, an ARD team visited both areas and undertook detailed case studies of the relationship between conflict and natural resources management. Several villages along the southern fringe of the buffer zone were visited to assess impacts of the civil war. A complete transect was made of the Menik Ganga basin, a water-stressed river basin in the south of the country formed the basis for assessing causes and effects of conflict over land, forest and water.

The two-decade long civil war created a buffer strip between the Sinhala and Tamil communities, and many villages in or close to the buffer zone were directly affected. Some villages were abandoned for up to 10 years until the threat of direct conflict receded and people could return home. These displaced farming or fishing communities generally stayed together as entire communities tended to stay in the same refugee camps, and in most of the villages visited they tried to return together. Where they managed to stay as a homogeneous group they could largely reestablish traditional rights of access to forests. However, in some cases, communities were broken up during the period of displacement because some people decided to stay in their new locations; many had relatives they lived with, others found off-farm employment. The returning refugees were frequently the poorer, less advantaged community members and they have not regained their access to forest resources to anything like the same extent.

In the southern communities, the combination of population pressure and weak governance over natural resources means that tensions over access to forests and water are increasing. Head-tail differences resulting from overwithdrawals of water from upper communities and upstream pollution affecting downstream water quality both generate conflicts. In addition, site specific issues over water for religious purposes and for wildlife have added to the tensions found throughout the Menik Ganga basin. Short-term solutions are sought but there is no systemic capacity to prevent them recurring.

An additional complication has been the strengthening of government powers to create and enforce forest and wildlife reservations. Some forests in the civil war buffer zone were designated as preserves during the period of displacement, and



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communities feel they have lost a lot of access. In Menik Ganga, large areas of forest previously open to local communities were designated as wildlife reserves, and are now surrounded by electric fences to keep people out and elephants in. The lack of any coherent capacity on behalf of provincial and local authorities to integrate management of land, water and forests means that a piecemeal situation has evolved that ends up satisfying a few people while marginalizing the majority. This is made more complicated as authority over land, water and forests rests with different Departments at national level, and they make planning decisions that do not effectively involve local communities. Water for irrigation is allocated separately for water for drinking or for industry, for example, so it is difficult to view resource management from a more holistic perspective.

A final case study examines a successful example of local management over water resources, where decisions over rights and access to water have devolved from central government to water users. Still in its infancy, the Ridi Bendi Ela Farmers Company provides one solution to conflict reduction.

Irrespective of the cause of the conflict, all of the case studies confirmed that it is inevitably the poorest and most marginalized parts of communities that suffer the most. They are the first to lose access to land and water resources, the least able to fight for their rights. As pressure on natural resources grows, particularly if there remains a disconnect between central government, local government and communities over how to manage it, we can be certain that the most vulnerable will continue to be the most severely affected when conflicts arise.

# PREFACE

This assessment of issues of conflict and natural resources management was undertaken one month before most of Sri Lanka's coastal fringe was devastated by the tsunami on 26 December 2004. The basic findings and conclusions remain unchanged as most of the assessment took place away from coastal areas. The one major exception in this report was that the entire tourist infrastructure of Yala National Park at the tail end of Menik Ganga was destroyed, and some 200 park workers, hotel employees and tourists were killed.

We would like to highlight a few issues that arise from the destruction of coastal communities and damage to fragile coastal ecosystems.

- Communities formerly dependent on shallow freshwater coastal aquifers that are now polluted require access to fresh water from other sources, adding to pressures in those watersheds where water resources are already fully committed or overcommitted. Allocation mechanisms must accommodate changes in demand for freshwater that include the requirements for coastal communities who were previously not part of the allocation process.
- Resettlement of refugees from coastal communities inland will intensify pressure of land, forest, and water resources, particularly as some may never want to return to their former homes. Mechanisms to include them as part of the community-level decision-making process in their new homes will be a priority in order to avoid potential conflict between established residents and refugees.
- Refugees from communities formerly dependent on tourism, coastal fishery, and salt production require alternative livelihoods, and many of these will likely be agricultural. This may increase pressure on land and water resources in tail-end portions of watersheds which were already under stress. Where possible, the full watershed resources have to be utilized rather than resettling refugees as close as possible to their former homes.
- Some coastal agricultural lands have been salinized. Although in the long-term leaching will remove the added salt, medium-term efforts will be required to return to productive levels obtained before the tsunami.
- Ecologically important areas such as Yala and Bundala have been severely damaged by salt and sediment. They will probably require additional fresh water to help restore and maintain wildlife habitats, yet they were already experiencing deficits due to upstream abstractions for water supply and agriculture prior to the tsunami.

All of these issues point toward the need for long-term watershed planning, allocation, and development involving land, forest, and water resources in those watersheds where there is likely to be significant redistribution of population. The eastern and southeastern areas of the island will be the most critical because water resources were already scarce, many are damaged, and adjacent inland areas have poor soils and marginal forest cover. This long-term approach has to start quickly and must be coordinated with pressing survival and reconstruction needs so that short-term mitigation programs do not inadvertently lead to longer-term deterioration of land and water resources.



# I.0 BACKGROUND TO THE SRI LANKA ASSESSMENT

## I.1 CONTEXT OF WATER CONFLICT IN SELECTED WATERSHEDS IN SRI LANKA

Sri Lanka has traditionally been divided into two distinct zones. The Wet Zone, comprising the central mountains and the southwest quadrant of the island, has abundant rainfall (>1700 mm per year) with no distinct dry season. Vegetation is lush, and most of the area was traditionally covered with forest. Development of the area by the Sinhala population resulted in a complex pattern of valley bottoms with small, community-managed, rice-based irrigation systems and limited exploitation of natural forest resources. The onset of the British colonial era changed this pattern. Many highland areas were cleared for tea and rubber plantations so that there are now only a few areas of original montane rain forests remaining. As population increased, the intensity of slash and burn agriculture also increased, with the result that many watersheds are degraded, soil erosion has increased, and overall natural resource productivity has declined. While there has been long-term concern over forests, their exploitation, and their degradation, there was little concern for water availability or quality; almost by definition, the Wet Zone was viewed as having more than enough water to meet all needs.

By contrast, the Dry Zone, which covers the northern half of the island, the eastern coastal areas, and the southeast, experiences an intense dry season between May and October that means sustainable communities are not possible without access to reliable water supplies. The traditional mechanism for settlement throughout most of this area has been through the development of small reservoirs (“tanks,” derived from the Portuguese word for reservoir) that could support a limited population in a complex relationship of rice-based irrigation systems, shifting cultivation (*chena*), and limited exploitation of lowland forest reserves. Except for the coastal fringes, groundwater is not easily exploited due to the hard rock geology of the area; without tanks little settlement is possible. The interconnected tank system, which exploits perennial streams in the mountains and transports water hundreds of kilometers northwards toward Anuradhapura to maintain tanks for irrigation and pleasure gardens, remains one of the greatest hydraulic feats of the pre-Christian era. But most of the Dry Zone remained with ample forest cover or grew back after the decline of the Dry Zone kingdoms and the establishment of Kandy as the center of Sinhalese culture.

After World War I, the colonial British government favored a policy of resettlement to relieve population pressure in the highlands of the Wet Zone. Initial efforts focused on restoring and upgrading abandoned tanks, and they then moved toward construction of newer and larger reservoirs. With modern irrigation systems the Dry Zone began open up and large transfers of population from Wet to Dry Zone continued after World War II.

The Mahaweli development program saw the greatest investment in irrigation systems, with an interbasin from the water-rich Mahaweli to the North Central Province, leading to large areas of Dry Zone forests being cleared for irrigation development. The tradition of settlement of the Dry Zone through irrigation continued with smaller reservoirs being constructed in increasingly marginal areas. By 1990 it became apparent that, for all intents and purposes, the water resources of Sri Lanka had been more or less fully exploited.

One important impact of overexploitation of water resources is the sudden increase in water quality concerns. As long as water is abundant, the quality of water remains a low concern because there is little visible sign of deterioration. When water resources become overused this leads to concerns about water allocation and eventually to debates over water rights and the management of water resources. At the same time, recognition that absolute water availability may be declining due to upper watershed deterioration, soil erosion, and deforestation has led to the understanding that a more holistic approach to natural resources management (NRM) is necessary. This holistic approach combines land, forest, and water management into an integrated process that is based around hydrologic boundaries and has the capacity to understand spatial relationships between different users of all natural resources.

This assessment examines several issues relating to land and water management in Sri Lanka. There are two underlying themes to the assessment: the relationship between NRM and civil war; and the extent to which competition over natural resources within watersheds leads to conflict. The assessment addresses a wide range of management-oriented issues, including institutional arrangements for NRM, the role of local communities and their interaction with national and regional organizations, the legal framework, and the impacts of current NRM activities of people and the environment.

At the heart of the assessment are several case studies that exemplify the NRM issues in different parts of the island. Three case studies are specifically oriented to the impact of the civil war on access to forest and water resources. These fall into a particular category of conflict, with the underlying issue of whether internal displacement of the population led to significant changes in traditional access to forests.

The second group of case studies deals with the emergence of local conflict and local solutions to resource management issues. There is no shortage of such developments throughout the island, each with its own unique problems and possible solutions. Examples of these conflicts are given in Box 1. However, while these examples all contribute to our understanding of conflicts and their resolution, they all lack the holistic dimension that appears essential to long-term management of land, forest, and water resources.

**Box 1. Local Conflict and Local Solutions to Resource Management Issues**

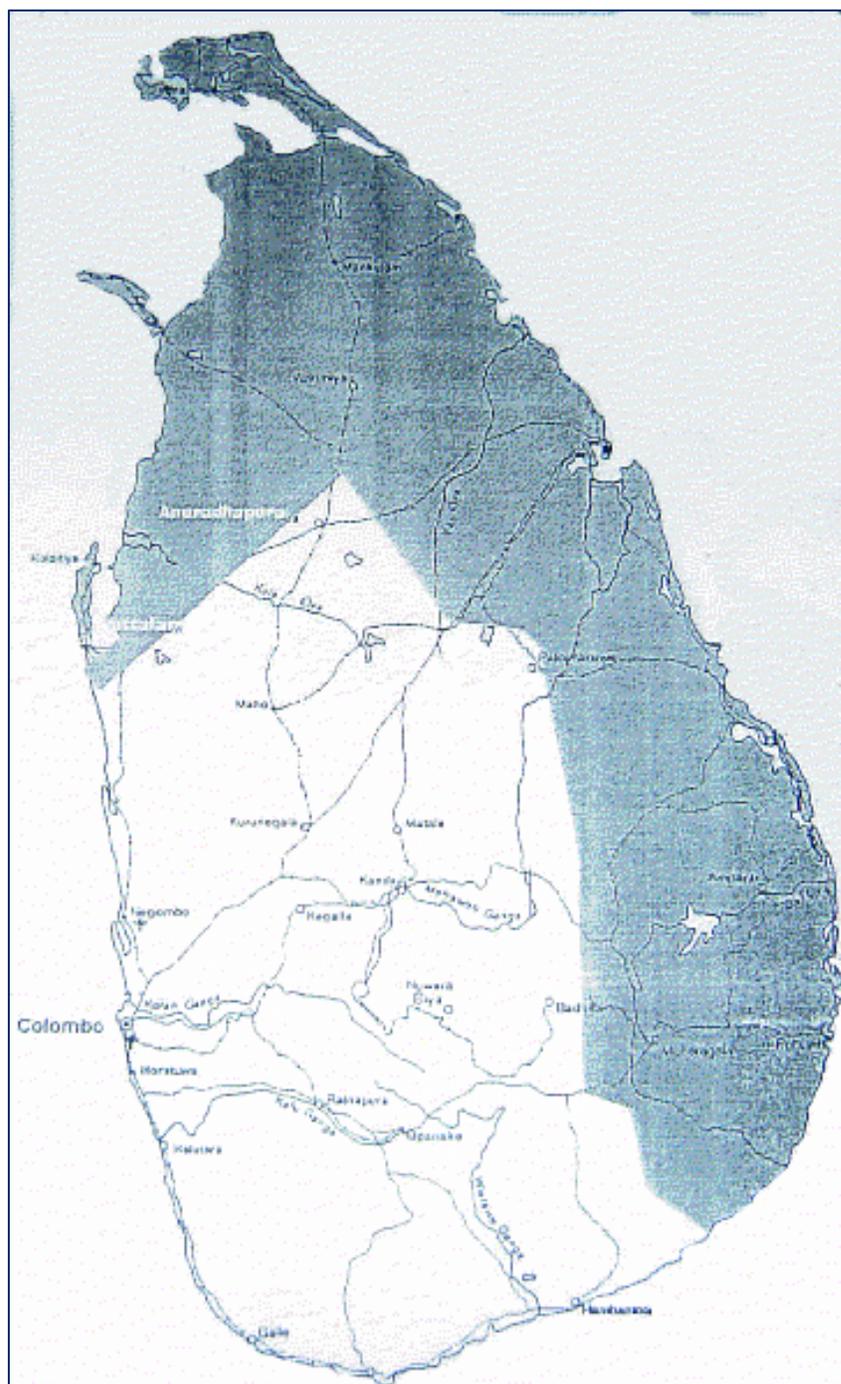
- **Avissawela: Stormwater runoff affecting drinking water supplies**
- **Kurunegala: Urban drainage**
- **Anuradhapura: Urban drainage**
- **Kirindi Oya: Irrigation conflicts**
- **Kelani Ganga: Salt water intrusion**
- **Samanala Wewa: Power versus irrigation**

We therefore focused our detailed field work in the Menik Ganga catchment in southeastern Sri Lanka. This river basin is considered to be one of the more water-short basins in the country, a combination of hydrologic conditions and over-allocation of existing resources among competing demands for that water.

## **1.2 SRI LANKA'S CIVIL WAR**

Sri Lanka has been ravaged by ethnic conflict between the majority Sinhalese and the minority Tamil separatists since independence from British rule. Violence began in 1971 and escalated into a civil war that has taken over 65,000 lives. The conflict zone, or the area of heaviest fighting, consumes most of the northern and eastern portions of the country (see Figure 1.1, a map of civil war-affected zones. Most of these areas maintain a significant Tamil population, although there are also important Muslim, Christian, and Sinhala communities, particularly along the east coast. Throughout the war, members of many communities in and around the conflict zone became refugees within their own country. The United Nations estimates that this civil war has turned as many as 600,000 Sri Lankans into internally displaced peoples. In February 2002, Tamil separatists and the Sinhalese-led Sri Lankan government signed a second cease-fire agreement. Though an official peace agreement has yet to be signed, the Government of Sri Lanka has made an effort to resettle people who had been living on the “fringes” of the conflict zone. At the time of writing this report (December 2004), the cease-fire appears particularly tenuous, although no major violations of the cease-fire have occurred.

**Figure 1. Civil War-Affected Areas of Sri Lanka**



**Civil war-affected danger zone of Sri Lanka is indicated in shaded areas of the map above.**



## 2.0 CONFLICT FRAMEWORK

The experience of conflict over watershed resources is complex and integrally related to larger issues such as NRM, land tenure, and economic development. Conflict over watershed resources at the community level is often caused by **the denial or restriction of the quantity and quality of water resources required by rural people to meet their basic and livelihood needs**. The scale of intensity ranges from very low-level cleavage between social groups without any immediate violence (although with the potential to escalate) to major confrontation that results in armed conflict and many deaths. For the purposes of this assessment, the working definition of conflict over watershed resources included:

- Watersheds in which end use interests of communities within the system are incompatible, particularly where water quality issues are present;
- Watersheds that represent a management challenge because of their relatively poor natural resource endowments, and where demand exceeds supplies on a regular basis;
- Watersheds affected by war and acts of physical violence; and
- Watersheds affected by habitat destruction and access limitation, particularly those with forest reserves and national parks.

### 2.1 FRAMEWORK

In order to understand a situation of conflict, we have applied an analytical framework that provides a basis for our assessment. The study team incorporated the USAID Conflict Assessment Framework with other key elements of conflict studies for purposes of this study, to include:

- **Determining the nature of the conflict.** Aspects of the conflict's nature include the identity of involved parties, geographic and temporal boundaries, and changes in the conflict scenario over time.
- **Identifying the underlying causes of conflict.** These are events or conditions that may not be readily apparent, but play an important role in fueling the development of the conflict. Understanding underlying causes is therefore critical to conflict prevention. Possible examples include political or ethnic divides, elite control of resources, economic divides, and entrenched management approaches.
- **Identifying triggers or windows of opportunity that enable conflict.** These are conditions or times when conflict is more likely to occur. Examples include times of economic shock, drought, or elections.
- **Determining vested persons' access to resources that facilitate conflict.** This part of the framework assumes that, in order to engage in and sustain conflict, people must have access to the necessary resources. These include sufficient financing, physical capital, legal support, and number of people and organizational structure to enables mobilization.
- **Determining state capacity to prevent or contribute to conflict.** Governments can play a critical role in mitigating conflict when conditions that could otherwise lead to violent outbreak exist. Examples of this include providing security forces, such as the police, providing mechanisms for dialogue and reform of ill practice, and reducing the incentives for violence through rules, regulations, and the legal framework. Conversely, they can also contribute to the development and experience of conflict through

repression, poor governance, and corruption, or by adopting *force majeure* or legislation that overrides customary rights and does not consult stakeholders as part of the rights definition process.

## 2.2 CONFLICT CATEGORIZATION

With the evolution of studies on natural resource-related conflict, various schemes have developed for “categorizing” or typifying conflict. By and large, these schemes address what their developers deemed to be important aspects of the nature of the conflict, as described as the first element of the framework above. Common approaches use one or more of the following variable sets to categorize water- or natural resource-related conflict:

- **Delineation by intensity of the conflict scenario.** Schemes that delineate conflict by intensity include COPDAB<sup>1</sup> and an adaptation of this for natural resources. They do not assess the episodes of violence alone. Rather, they seek to measure the presence of factors that either contribute to conflict or mitigate the chances of conflict developing. At the “conflict” end of the scale, violent, declared fighting exists. At the “peace” end of the scale, parties are engaged in organizational cooperation and official agreements. A neutral state of insignificant acts between parties lies at the center of the scale. As such, the scheme recognizes tendencies toward violence and tendencies toward sustained peace as part of one continuum.
- **Delineation by issue area.** These schemes delineate conflict according to the primary resource issue over which the conflict exists. For example, water-related conflict is often divided into conflict over water quantity, quality, hydropower, infrastructure, etc.
- **Delineation by basis of conflict.** This type of scheme looks at the motivating factors that cause parties to be at odds. Peter Gleick developed such a scheme for water-related conflict.<sup>2</sup> Categories under this scheme include:
  - Conflict over control of water resources, where competition for control over access to water is at the root of tensions;
  - Water as a military tool, where water resources or systems are used as weapons in military action;
  - Water as a political tool, where water resources or systems are used for a political goal;
  - Terrorism, where water resources or systems are either targets or tools of violence or coercion by non-state actors;
  - Water as a military target, where water resources or systems are targets of military actions by nations or states; and
  - Development disputes over water, where water resources or systems are a major source of contention and dispute in the context of economic and social development.

Though not a comprehensive list, these approaches have been used to develop databases on water- and natural resource-related conflict in various parts of the world. They serve as a useful starting place for assessing the categorization of conflict related to watershed resources in Sri Lanka.

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<sup>1</sup> The COPDAB, created by Edward E. Azar, codes interstate and intrastate events for approximately 135 countries from the years 1948–1978 and contains 256,373 event records. Event information was derived from a wide range of U.S. and foreign news sources and includes event date, initiating actor, event target, information source, issue areas, brief event description, and a numeric code assigned from a 15-point categorical scale and ordered by the intensity of event conflict or cooperation. The data set does not include any water-specific coding; however, the brief textual summary provided a guide to identify possible water-related events.

<sup>2</sup> "Freshwater Resources: Managing the Risks Facing the Private Sector," Dr. Peter H. Gleick and Jason Morrison, August 2004.

## 2.3 ISSUES OF SCALE

The scale of any given conflict is a critical factor in watersheds. Some conflicts affect the entire watershed and may cut across political and administrative boundaries. These are frequently addressed at national or provincial levels with significant involvement by government and politicians. Other conflicts may be at the local level, where adjacent communities are in a struggle over the use of resources. These conflicts may not affect other people within the watershed, although clearly they have the potential to spread if resources are under increasing pressure. There are conflicts at the individual level that may go largely unnoticed but still represent a considerable threat to the livelihoods of those involved.

Scale issues also impact on the mechanisms adopted to resolve conflicts. Ideally, the resolution mechanism should be at the level at which the conflict occurs. But where some form of mediation or independent arbitration is required, a default upwards is normally found. Hence communities may be involved in trying to resolve disputes at the individual or family level, while civil authorities may get called in to mediate inter-community conflicts. The closer the resolution mechanism is to the level of the conflict, the more likely it is that the proposed mechanisms for resolution will be acceptable to all parties.



# 3.0 STUDY APPROACH

The study team utilized a phased approach to identify and investigate key issues related to conflict and watersheds in Sri Lanka. The first phase consisted of a series of interviews with managers and technicians who are involved in relevant watershed resource-related work in the country. They included representatives from institutions and organizations listed in Box 2. In selecting these individuals, the team sought to include those who have been engaged in the field for a long period of time. Interviewees helped to provide a historical perspective on the institutional aspects of and approaches to resource management and conflict mitigation in the country.

The objectives of these interviews were to:

1. Identify key issues related to war-affected watershed resource management and key issues related to conflict over watershed resources;
2. Identify geographical areas to investigate as case studies of the key issues;
3. Determine how project managers view the present and historical situation of watershed resources management in the country; and
4. Identify approaches to resources management and conflict mitigation that government and donors have attempted in the past and identify the results of those attempts.

**Box 2. Institutions and Organizations Involved in Relevant Watershed Resource Work in Sri Lanka**

- United States Agency for International Development (USAID)
- Sri Lanka Department of Irrigation
- Mahaweli Authority
- Lanka Jalani (the Sri Lanka chapter of the Global Water Partnership)
- International Water Management Institute
- Japan Bank for International Cooperation
- Asian Development Bank (ADB)
- ADB Protected Area Management and Wildlife Conservation project
- ADB Water Resources Secretariat Project
- Environmental Management, Limited

The study team selected river basins and, within them, specific watersheds, that would serve as case studies for field-level research during the second phase of the study. The river basins selected were:

- *The Kala Oya and Yan Oya River Basins, for the effects of conflict on select watersheds.* The team selected these river basins because stakeholder communities live on the fringes of the “conflict zone” and near valuable forest resources. Because of their location on the fringes of the conflict zone, many residents became refugees themselves, while many have also been affected by an influx of refugee settlement from other parts of the country. Traditional *pura* communities, who have strong ties with the forest resource base, reside in the area. In parts of the basins, peoples of different ethnicities live in close proximity to one another, and concerns over water quality are considered serious.
- *The Menik Ganga River Basin, for watershed-resources related conflict.* The team selected the Menik Ganga because it is a water-short basin with demands on its water resources by a wide range of stakeholders, including those who use the water for cultural, wildlife, industrial, agricultural, and domestic water supply. In addition, there are demands on the Menik Ganga water from a neighboring basin, whose stakeholders are expecting Menik Ganga waters via a proposed trans-basin diversion.

The team proceeded to visit each basin, conducting a series of interviews and focus group sessions with 17 stakeholder groups. In addition, the research team met with key local officials, including officials from the Department of Irrigation (DOI), the Department of Wildlife (DOW), and the National Water Supply and Sanitation Board (NWSSB). Researchers utilized a conflict assessment framework and the asset-based

approach to poverty assessment in formulating and conducting interviews and focus group sessions. This enabled the team to search for conflict typologies, assess relevant issues, and analyze changes over time.

The third and final phase consisted of writing a draft of findings together with a presentation to USAID in Colombo. The Mission Director, Carol Becker, was present with several other members of the USAID/Sri Lanka Mission. Based on the discussions at this presentation, the team returned to the US to complete the final report.

# 4.0 STUDY RESULTS

## 4.1 CONFLICT FRAMEWORK

In the watersheds studied, most direct *conflict* over watershed resources occurs in isolated instances between small groups of resource users. Other *disputes* exist with between and within factions of local community, government, and industry. Communities assessed convey a greater tendency to fight over water resources than forest resources for reasons explored below.

Throughout most of the areas studied, communities express concern over loss of access to natural resources. In the case of both forests and water, their primary concerns relate either to the use of the resource by outside parties or to government approaches to resource management that may override their perceived customary or long-established rights.

However, it appears that less direct conflict arises between users over forest resources than over water resources. In all river basins studied, forest resource users explained that when they become enraged over outsiders' use of forest resources, they would either stand back or attempt to engage the police as mediators, rather than directly attack the competing users. Outsiders tend to be seen as more powerful, either because they are believed to have political connections or because they may be armed.

Amongst community members, conflict over forest land is also less common. Due to the physical characteristics of land, traditional rights to a section of forest are more clearly established and understood than rights to a given quantity of water. Communities show a clear understanding of and respect for these traditional rights and, in most cases, seem to have local mechanisms for resolving disputes. Further, in many of the areas visited there are other locations, albeit not necessarily as productive, which can be used by the community as one part of the resolution mechanism.

Disputes over water resources in these areas, however, more frequently evolve into minor conflicts between users who do not engage the police for mediation. Examples of this include the almost annual conflicts reported between upstream and downstream irrigators in the Menik Ganga (see Appendix A: Pump Operators, Gonagan Ara Case Study), which occur when downstream farmers travel upstream to open the small, unofficial diversion gates of small farmers. Another example is the conflict between Veheragala and Kataragama farmers over diversion of Menik Ganga water to the Kala Oya River Basin (see Appendix A: Veheragala Reservoir Case Study).

The case studies suggest that at least three factors intensify the situation of conflict between users over watershed resources:

1. *Expectations of future resource allocations promised by the government:* When communities are led to believe that they will have access to water, land, or forest in the future, they are more likely to become reactionary in situations of scarcity or denial. Governments and politicians in Sri Lanka have a tradition of allocating resource access rights, particularly in election periods, that are seen to be a commitment, but they are not always honored at a later stage. Because much of the land in Sri Lanka is “crown land” that has belonged to the government since the colonial era, people understand that the government can grant access rights to both forest and water resources and, thus, their expectations are raised when the government makes promises. Unfortunately, each promise is made in isolation without a full understanding of the resource base and pre-existing legal or customary rights.

2. *The dependency of livelihood strategies on the resource:* People display a greater inclination to initiate or get involved in conflicts over access to a resource if they depend on it for livelihood or income generation. People are less likely to initiate conflict over a resource when it is only used to meet basic daily needs. This seems to be partly due to direct economic reasons and partly because many income generating uses of water, such as irrigation, involve large volumes of water that cannot be disrupted for long without threatening production. Also, people often have access to multiple sources of water in small quantities for drinking and bathing, using rivers, tanks, and deep and shallow wells. Thus, when Lunugamvehera farmers began to initiate an informal diversion from the Menik Ganga, downstream users feared that were to be deprived of water and this led to conflict between different communities. In contrast, Kataragama townsfolk who were in danger of losing drinking and bathing water made milder complaints. Similarly, the regular conflict between upstream and downstream water access occurs between groups of agricultural water users, even though domestic users, wildlife advocates, and industry reside downstream of the disputed diversion points.
3. *Direct versus indirect impacts of access to resources:* Surface water resources are particularly vulnerable to conflict because there it is easy for people to see the direct impacts of upstream abstraction or pollution on their own water supplies. This is much less obvious for competition over groundwater, where it is not easy to see who or what is the source of declining water levels, or access to forest lands where there may be opportunities to quickly move to another part of the same forest. Weirs and diversions of surface water resources provide a “point-of-intervention.” By contrast, the multiple pumping of surface water resources did not seem to concern downstream users because they felt the extracted volume was very small (in reality, the number of pumps indicates a direct and significant impact of downstream water availability), and the timing of pumping (early in the year) did not have much impact during the most critical period of water shortage.
4. *The nature of a group’s claim to customary rights:* When confidently explaining their rights to resource use in contrast to those of other users, stakeholders regularly refer to their people’s history of resource use or their forefathers’ contribution to water diversion structure development. One important variable that defines groups of people in a conflict, therefore, is the historical nature of their relationship with that resource. “New” and “old” resource users experience dispute over resource use, as in the situation between refugees and locals over access to fish and *chena* land in the Kala Oya Basin, and between new and old settlers to an irrigation system in the Menik Ganga. However, when customary rights are lost due to new government regulations, such as creation of forests or national parks, stakeholders are poorly positioned to preserve their access rights.

In addition, disputes occur between stakeholders at other levels of society. While these disputes do not classify as “conflict,” with the potential to escalate into violence, significant implications exist as to the management scenario of watershed resources. As such, they deter Sri Lanka’s ability to prevent future conflict at the user level. Examples of these, clearly voiced by vested parties through the course of the research, include:

- Disputes between the DOI and the DOW over the development of diversion structures or the allocation of waters from a reservoir; and
- Disputes between private industry and communities, and between private industry and nongovernmental organizations (NGOs), over the approach to managing water quality.

When addressing government agencies or private industry, the community users either lobby directly with that agency (as experienced by Kataragama farmers), lobby with the District Authority, or avoid the agency altogether, as with the traditional shifting agriculturists in the Yan Oya Basin. Nonetheless, stakeholders in the Menik Ganga place much of the *blame* for their problems with water quality and quantity on the major industry in the middle basin: Pelwatte Sugar Industries (PSI).

When the team assessed the experiences of conflict in the watersheds studied against conflict categorization schemes (as summarized in Section 1.0), it became clear that while categorizing a conflict by “issue area” is often appropriate, categorizing a conflict by “basis of conflict” or by “intensity” is less realistic. The latter two schemes can be used only when applying a snapshot view of conflict at a given moment in time. Otherwise, it is more appropriate to view them as potential stages in the life of a conflict.

Regarding conflict over watershed resources by issue area, the study team found that conflicts among community stakeholders, as noted above, are most likely to occur when livelihoods area at stake. As such, conflicts over water for irrigation are common, whereas conflicts over water quality and access to potable water are less common (partly because there is no simple identifiable source for degradation). The only exception to this comes when there is a clearly identified point source of pollution, such as the PSI factory. Similarly in communities dependent upon the forest for their livelihoods, the small incidences of conflict reported between resource users involved claims to non-land livelihood resources, such as beehives for honey collection.

There is no direct correlation between the degree to which the issue area is problematic and the level of conflict that it generates. For example, a recent study by Lanka Jalani reveals that fecal coliform rates in sampling points throughout the Menik Ganga Basin are above acceptable World Health Organization levels, while other contaminants are only high at certain locations. Health officials and national-level water resource professionals all list water quality as a leading concern in the watersheds studied. All community stakeholders interviewed use the river for bathing. However, none interviewed expressed any concern about the high fecal coliform levels that exist in their river water. Some explained that their children get sick during the rainy season, but they did not make a strong correlation between this and their water quality. Water users downstream of PSI explained that their primary concern over water quality is effluent from PSI even though measurements indicate that fecal coliform is the most serious threat to water quality. They claim that, although PSI has installed a wastewater treatment facility, the company is contributing to occasional bad smells and consistent high turbidity of the river—palpable changes that, unlike other types of contamination, are readily noticeable. There is a tendency to blame PSI with no consideration of how factors like untreated domestic water, deforestation, and agro-chemical use upstream actually affect the water quality.

Regarding “basis of conflict” categorization of watershed conflict, the study team found that many categories can apply to the same conflict situation over time. This is, therefore, not a useful means by which to measure watershed resource-related conflict. For example, three of the categories of the basis of conflict scheme include: 1) conflict over control of water resources; 2) conflict as a political tool; and 3) conflict over water resources development and allocation. Existing tensions in the Menik Ganga have led to conflict over control of water resources. In more than one such conflict, politicians have entered the scene and vied with one another, therefore, using water resources as a political tool to gain political leverage. (Conversely, there are also instances, as in the case of the Veheragala Reservoir, where the use of watershed resources as a political tool can fuel conflict over control of resources.) Conflict over resources as a political tool could easily be turned into the use of resources as a military tool if war were to break out. Thus, a conflict cannot be characterized by one of these elements. Rather, the identified basis of conflict in the scheme serves as a set of ingredients that may occur throughout the life of a water conflict situation. Similarly, the “intensity of conflict scenario” waxes, wanes, and takes on different direction over time.

The most significant “trigger” or “window of opportunity” in conflict over watershed resources in the study areas is drought. Menik Ganga farmer groups explained that conflict between upstream and downstream users occurs during the Dry Season of every year, when rainfall is minimal. This, more so than any other event, is the window of opportunity in which conflict over watershed resources is likely to arise. (Interestingly, the civil war was not deemed a significant trigger for watershed resources conflict. Even communities of mixed ethnicity, including Sinhala and Tamil, reported little experience of conflict related to

tensions over the war. While the war intensified tensions between refugees and locals, these did not rapidly break into a situation of conflict over watershed resources.<sup>3)</sup>

When considering vested persons' access to conflict resources, the case studies suggest that social resources are by far the most critical to potential violent outbreak. Experiences of conflict over water resources have to date involved groups of people who organized themselves or followed a mobilizing leader and have had less to do with the amount of money or physical capital on hand. The Lunugamvehera residents illustrate this point: two dynamic leaders were able to organize and motivate between four and six thousand farmers (depending upon who was reporting) with no income from irrigated land to collect as much as R8 million, and spend seven days traveling to a neighboring river basin in a concerted effort to establish their rights to Menik Ganga water in the face of decision makers and other water users. Less cohesive communities with weaker leadership may have more disputes, but they are less able to mobilize for involvement in conflicts.

Interviews and case studies clearly revealed that the most significant underlying cause of conflict over watershed resources in the areas studied is that of **poor resources management** at the basin level. Other underlying tensions, such as political and ethnic divides, seem to play less of an *underlying* role in the watershed resource-related conflict, even in communities of mixed Tamil and Sinhala peoples.<sup>4</sup> (In some cases, however, vying parties may use them to magnify tensions and conflicts over resources that develop for other reasons.)

Existing government **resource management practices** contribute significantly to conflict among resource users due to lack of effective policy to guide effective management. However, even without policy revisions, many steps could be taken to improve management and thereby reduce the tension caused by existing resource use and management practices. As the most fundamental underlying cause of conflict, this is also one of the most important issues to address for prevention of future conflict. We explore this in further detail in the Section 4.2, Key Aspects of NRM Capabilities, but, in summary, most conflict over resources stems from poor knowledge of actual resource availability within government, lack of understanding of customary rights and practices, little or no consultation with stakeholders so that resource reallocation is imposed rather than negotiated, and fragmentation among government agencies.

## 4.2 KEY ASPECTS OF NRM CAPABILITIES IN SRI LANKA AND SELECT WATERSHEDS

Interviews in Colombo and in the watersheds studied, as well as with focus group sessions with watershed stakeholders, strongly indicate that management of watershed resources in the areas studied is fragmented. Government agencies have responsibility for various aspects of watershed resource allocation and use, but no overall management entity exists. Communication about resource management amongst resource users of different sectors, communities, and geographic locations within a river basin currently happens only in times of crisis.

### 4.2.1 The Traditional Concept of Dry Zone Villages in Sri Lanka

Dry Zone forests fall into two main types: forests on hilly areas where access is difficult and that are not well suited for widespread cultivation; and the more scrubby plains forests, dominated in the north by acacia species. These areas are easier to clear for shifting cultivation. However, because water is critical in the dry

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<sup>3</sup> The situation may be significantly different in areas of the country that lie deep within the conflict zone.

<sup>4</sup> In Old Eluwankulema, a community of mixed ethnicity, ethnicity also did not appear to be a dividing factor with respect to families' resettlement decisions. Those settling back into the original homeland were both Tamil and Christian. The common factor among many resettlers was lack of access to land (rather than ethnicity), suggesting that economic standing divided the community more so than ethnic differences.

season in the lowland areas, settlements are normally based around more reliable water supplies, such as tanks or perennial streams. These are then surrounded by zones of shifting cultivation and finally forest areas where cultivation is very limited.

The original inhabitants of the Dry Zone, the *veddas*, were always hunter-gatherers with very low levels of agricultural technology. Although few untouched *vedda* communities exist, many more remote villages still have strong *vedda* traditions of non-exploitative forest use. These communities generate much of their income from hunting and gathering, only felling trees when required for basic needs of housing and firewood. Villages that have grown up in traditional *vedda* areas still have well-defined forest areas in which they expect to have a monopoly on non-exploitative access rights.

The shifting cultivation, *chena*, is an important component of village life throughout the Dry Zone. Individual families have customary rights to *chena* lands that include both the currently cultivated land and all fallow lands that have been cleared and are recovering after one to two years of cultivation. The return interval is rarely less than five years, and other families will not try to clear these fallow lands because of the recognition of the pre-existing rights, but also because the land will be significantly less productive. *Chena* land is cultivated using low levels of agricultural technology and virtually no inputs and is dominated by vegetables, non-rice grains (grams, lentils, and maize), and some fruits. In most villages, the male family members will spend much of the growing season in the *chena* lands, away from the village, due to problems of wild animals. Elephants are particularly troublesome, and many villages have established elephant watch towers where people nights guarding the crops.

In well-established villages there is almost always some rice cultivation, using small village tanks. These tanks, at worst, provide supplemental irrigation during the wet season to ensure a single crop and, at best, allow for a second, dry season rice crop over part or all of the cultivable area. There is very little cultivation of non-rice crops on rice land because there is sufficient *chena* to grow vegetables.

The best and most prosperous villages are those that have access to all three of these production systems: lowland rice around a tank<sup>5</sup>, *chena* lands within reasonable distance to the village, and more distant forest land for hunting and gathering. Particularly in the visited northern parts, almost all of the people interviewed had a very clear understanding of which villagers had access rights to rice lands, *chena* land, and forest lands. There was also clear understanding that the community would quickly move to re-establish the traditional system if people tried to abuse these rights.

This is a fairly land-extensive system, and most of the non-war conflict problems arise when villages either lose access to a part of this resource system due to government intervention or when new settlements are developed as a consequence of continuing population pressure.

#### 4.2.2 Government Involvement in Land and Forest Management

The vast majority of land in Sri Lanka, especially in the Dry Zone, has traditionally been under state ownership.<sup>6</sup> This means that government has a direct involvement over rights allocation. Most smallholder agricultural production occurs on land that is either state-owned with user rights allocated (such as on irrigation schemes) or state-owned with no private deeds or user rights allocated, as in much of the national forest land.

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<sup>5</sup> Politicians have often used the phrase “rock, tank, and temple” to define grass-roots, rural Sinhala society.

<sup>6</sup> However, recently laws have been changed that enable people to obtain title to state lands to which they have had rights of access. While this allows for resale and mortgaging of property it has not yet materially affected access to resources because obtaining a land title is dependent on establishing a right to use that land. Problems may arise in the future, however, if land traditionally used for community access is transferred to individuals.

Three government departments maintain primary responsibility managing the use of this land:

- The DOW is responsible for protected areas management and for protecting wildlife throughout the island. There has been significant enlargement of protected areas during the past couple of decades, driven in part by greater concern for ecological preservation and tourism opportunities. Elephant protection has been a significant driving factor, attracting donor interest and support, and has led to the enlargement of many of the protected areas. The DOW has draconian powers for searching people and property for evidence of illegal hunting of wild animals and can impose large fines or prison sentences on offenders.
- The Department of Forestry (DOF) is responsible for national forest land and non-irrigated, non-protected government-owned land. The DOF determines the extent of forest preserves, which are marked by boundary posts and within which tree-felling and *chena* cultivation are prohibited. There have been efforts over the past decade or so to better demarcate forest preserves, extend their area, and police them. This appears to reflect greater concern for watershed protection developed over the past few years and also attempts to limit illegal logging by commercial enterprises.
- The DOI is responsible for the allocation and upkeep of government-owned land under irrigation settlement schemes.<sup>7</sup> When large irrigation systems are developed, the DOI allocates the irrigated farms to the new settlers, including those who had existing customary land rights in the newly developed lands. Settlers are given a set portion of rice land (normally about 1 hectare [ha]) and a small homestead parcel of land for a home and upland cultivation.<sup>8</sup> Settlement lands cannot be sold, sub-divided, or otherwise modified but the right to cultivation is sustained indefinitely. This quickly creates a second-generation problem, where only one child gets the official right to the land when the original settler dies and the others become landless.

A major finding of the team is that there is very little linkage between government actions and the customary usage rights developed at community level. All three of the agencies described above can make their decisions in Colombo without any discussion with community members. With expansion in both the wildlife protected areas and forest reserves, communities have found that part of their traditional livelihood has been either taken away completely or access now carries a much higher risk.

In the war-affected areas, returning village members face a situation where community level rights, established before the war, are understood and respected but the available resource base is changed. A few places have become out of bounds due to land mines, and others had been included in expanded forest and wildlife reserves. Those with access to agricultural fields under tank irrigation similarly recognize traditional land use rights. After the cease-fire agreement, returning refugees continued to respect original user rights of land under tank systems, even amongst returning refugees who had been away from their home area for ten years (as in the case of Pavipamaduwa).

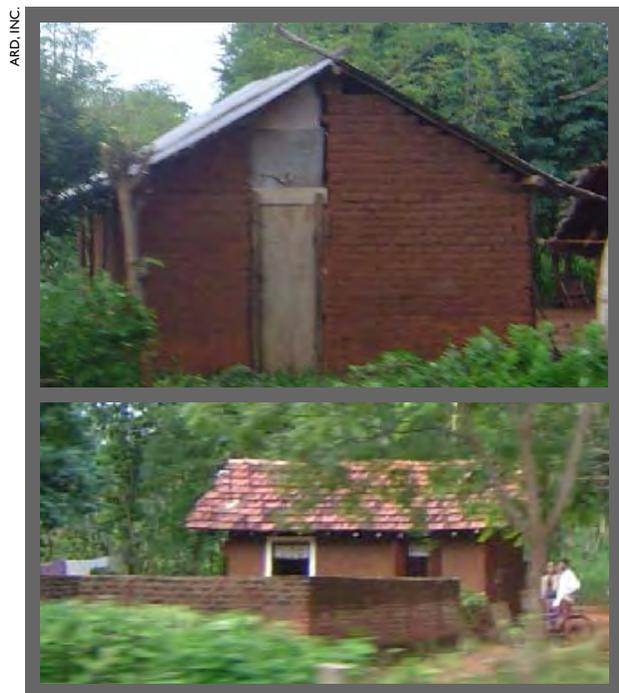
The study team found that the government's approach to distribution of land varies with geographic location and does not serve as a check on environmentally sound resources management. In one case, the DOI explained that it has unclaimed, irrigation-ready land under a new irrigation scheme in the Menik Ganga. However, the allocation for this highly prized land has yet to be established. One DOI manager explained, "The land is there. The water is there. The problem is who to give the land to."

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<sup>7</sup> These schemes are distinct from village tanks which were developed centuries ago and whose management is nominally under the control of the Ministry of Agriculture. In fact, these tanks are effectively managed by the community itself and form part of the traditional Dry Zone village agricultural system.

<sup>8</sup> Each plot is numbered so the rice land and the associated homestead plot have the same number. In newer systems, farmers often refer to each other by the plot number rather than their names. Settlers have no established rights of access to *chena* or forest lands.

Inconsistencies also exist with respect to the allocation of non-irrigated land. On the border of the Menik Ganga and Kala Oya river basins, the team visited an area where the Local Government of the JVP (*Janatha Vimukthi Peramuna* or Peoples Liberation Front party)<sup>9</sup> has been allocating marginal land to young families, often as a reward for political support. These families currently live in conditions of more severe poverty than most communities in their watershed, and they are vulnerable to devastation if drought strikes in future years. Pictures of homes in the JVP-settled marginal lands near Lunugamvehera are below.



Once a farm has been established, it is accepted that the household is entitled to compensation if the government wishes to change the land use. This frequently involves offering a similar parcel of land elsewhere, which is likely to be marginal due to the over-extension of land with productive resources.

In contrast, in certain areas of the country where the Asian Development Bank (ADB) upper watersheds program is being implemented, families must meet certain environmental criteria in order to be granted land use rights. Families cultivating on marginal land are not granted rights, but they continue to cultivate the land because it is their only option for survival. With no government officiated rights to use the land, they are not eligible participate in government or ADB-sponsored conservation efforts. This strict approach to rights allocation and conservation assistance is also not conducive to improved resource management.

In much of the government-held forestland, the design and enforcement of conservation *rules* face similar challenges to those of land rights allocation. While communities interviewed perceive that the DOW and DOF are increasing efforts to protect forestland, the land itself remains under intense pressure. Case studies and interviews conducted, particularly in the north, suggest that there is a strong and growing tension over use of forestland. Communities' access to the forest is restricted, but abuse of forest resources continues. The study team found only found one example where the DOF is actively working with villagers to provide an incentive for reduced dependence on shifting agriculture for livelihoods.<sup>10</sup> In other villages, and particularly in areas populated by traditional communities in the north, the study team found noticeable tension between communities and the DOF and DOW over restriction to forest and conservation land.

In and around Yakaweva and Old Eluwankulema, communities contend that the DOF and DOW are intensifying restriction to forestland much more strongly than in the past. Both departments have substantial powers to prosecute people who break regulations. Communities cite recent incidences in which neighboring peoples were taken to court for cultivating in the forest. They continue to utilize the forest for traditional livelihood practices, perceive the DOW and DOF rules to be inflexible, and are increasingly fearful of retribution from the government. Communities claim that the departments have made no efforts to seek a

<sup>9</sup> The JVP is a left-wing party with a revolutionary ideology. In 1971, they attempted a coup, which nearly succeeded, that was violently suppressed by the government. In the late 1980s, they took control of many parts of the south of Sri Lanka, and there was a period of terrible loss of life and collapse of law and order. Since then, the JVP has transformed itself into a mainstream political party with a strong populist message and is now is an official part of the ruling government coalition.

<sup>10</sup> In this case, the DOF offered residents of Pavipamaduwa a piece of forestland planted with teak trees that they could manage and. Ultimately, harvest.

consensus-based approach to forest management. At the same time, they claim that wealthier illegal operators harvest from the forest without fear of retribution. As such, the relationship between villagers and the government agencies remains confrontational rather than managerial. Some strongly requested assistance in negotiating rights with the DOF for use of forest resources.

When discussing their perception of environmental management, those engaged in shifting agriculture in the forests expressed a basic awareness of the importance of forest conservation to the greater ecosystem. One Yakaweva community member explained his perspective: “If the forest disappears, there will be no rain.” They explain that they have learned these concepts through television and school. Many contend that although they understand the importance of conserving the forests, they want to continue to cultivate them in what they argue is a more sustainable manner than the approach taken by illegal loggers.

### 4.2.3 Water Resources

Interviews of Water Resources Project Managers in Colombo as well as throughout the Menik Ganga river basin revealed key aspects of the challenges to water resource management and water-related conflict prevention in Sri Lanka. Similar to land, water resources suffer from a situation in which no one institution is responsible for their management. Because of this, there is no mechanism for controlling water use outside of government schemes, such as direct pumping of surface water by informal irrigators. The current administrative arrangements for water are as follows, although readers should be aware that there have been numerous changes over the past four years due to political changes at national level. The current fragmentation is not significantly different from those under previous administration.

The Ministry of Agriculture, Livestock, Lands, and Irrigation includes the Department of Irrigation and Water Resources Board. The DOI is responsible for the planning, development, and implementation of irrigation systems, while the Irrigation Management Division takes responsibility for operations and maintenance of larger irrigation systems. The Water Resources Board has had long-term responsibility for water resources planning, but recently it has become somewhat less effective due to emergence of new institutions.

The Ministry of Mahaweli, River Basins, and Rajarata Development is responsible for management in the Mahaweli and other large river basins, and includes the interim National Water Resources Authority (which has yet to establish an effective role in water resources management). Originally created to develop the water and land resources of the Mahaweli River (16% of Sri Lanka) for agriculture, hydropower, and flood control, the ministry is under pressure to become the premier river basin management agency in Sri Lanka. This should replace some of the functions of the Water Resources Board, but this process is still in transition.

The Ministry of Urban Development and Water Supply includes the National Water Supply and Drainage Board, which is responsible for townships’ and villages’ drinking water. They can tap both surface and groundwater resources, but they prefer to develop groundwater because water quality is often seen to be better.<sup>11</sup>

The Ministry of Environment and Natural Resources includes the Central Environment Authority that sets water standards and is currently responsible for most water quality monitoring. This ministry now also includes the Forest Conservation Department, the Department of Wildlife Conservation, the State Timber Corporation (a parastatal organization charged with commercial exploitation of forest resources), the Natural Resources Management Division, and the Pollution Control Division. Eventually water quality monitoring will pass to provincial governments, but only the Northwest Provincial government has any form of water

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<sup>11</sup> In some parts of the south and southeast, deep water supply wells have experienced problems with high concentrations of iron and fluoride, so that villagers prefer to use shallow wells when they can and only use the deep well water during the dry season.

quality program. Provincial governments currently do not have staff or financial resources to undertake these responsibilities.

Although the DOI must now go through environmental impact procedures in order to approve and proceed with infrastructure development, they also have no mandate for environmental river management or groundwater management. If, during low flow periods, a diversion structure can divert all water out of the river, there are no obligations to keep a minimum flow passing downstream.

Combined with this fragmented approach to surface water management is the lack of clearly defined water rights for any user. The government continues to own and control all surface water resources. For irrigation systems, users receive seasonal permission to use water through a meeting process that is a longstanding practice in Sri Lanka. In this process, the DOI makes an assessment of likely water availability for the upcoming season. If the DOI predicts that water available will be less than the quantity required for full cultivation of an irrigation command area, the seasonal meeting will determine which portions of the area will be entitled to water. While this is theoretically a participatory process, it is often a practice in legitimizing decisions made by civil authorities.

In addition, locally-constructed diversion structures have been able to take as much water as possible out of the river, whether they are constructed by villagers or through government assistance. Typically, a diversion structure in Sri Lanka, known as an *anicut*, will divert all available river water up to the capacity of the canal. The *anicut* may return some of this flow to the river if it is not utilized through spillways constructed further down the canal. This makes for easier management, as the diversion structure gates do not have to be adjusted, but it essentially gives priority to head-end users by permitting a first-come first-served approach. Surface water withdrawals for urban water supply can be developed without any permitting, based on an assessment that there is sufficient water available. Individuals with pumps (such as the “Gonagaran Ara pump operators” in the Menik Ganga study) also do not require permits. Although they indeed are often seen as illegal water users, sanctions against pump irrigators are few and far between.

This situation means that surface water resources have been developed on a case by case basis. In many instances, there has been little to no analysis of the interactions with downstream water users. Eventually, downstream users who establish a customary right to water use may find themselves without water due to uncoordinated upstream development. The Kataragama *anicut* serves as one example of diversion infrastructure on a water short river is that of interest (see case study). The DOI recently completed this diversion structure near the tail end of the water-short river, just upstream of two important water user groups that experience drastic water shortages each year: the Kataragama town water supply and Yala National Park. According to local officials, the *anicut's* construction was authorized with the help of political influence from the highest levels of Sri Lankan society.

The study team found that a general lack of knowledge among river stakeholders about the extent of existing and planned water uses compound this management ambiguity. People are generally aware of activities near their own communities, but have limited knowledge of more distant extractions and water polluting practices.<sup>12</sup> With water needs of political and religious importance, such as providing bathing water for pilgrims at Kataragama, is it likely that all people along a river will understand the situation. Interviewed Menik Ganga stakeholders, for example, expressed a variety of perspectives on the extent of river water pumping carried out by unofficial pump operators along the river (see Gonagaran Ara case study). With little information about the true nature and extent of extractions and pollutants, stakeholders tend to blame large industry, such as the PSI, for all of their water quality and quantity problems (see Pelwatte Sugar Industries case study).

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<sup>12</sup> In the Menik Ganga, all communities interviewed are aware of the Kataragama festival. It is also unique in its cultural importance and in the extent of state-backed enforcement over upstream water conservation to provide sufficient festival water supplies.

The lack of general understanding is paralleled with a lack of specific hydrologic information in the basin. The DOI keeps limited records of stream flows and volume of water in reservoirs, but it keeps this information to itself. This prevents others from understanding what the overall hydrological situation is at any given time or what trends have been occurring. Similarly, the DOI does not make information public on procedures for reservoir water management. In doing so, the DOI may seek to minimize public pressure about allocation decisions.

When questioned about approaches to resource management, it became clear that the two main government institutions responsible for water use in the Menik Ganga, the DOI and the NWSSB have differing opinions. During interviews, DOI managers expressed strong sentiments against joint water management concepts. They and other Menik Ganga stakeholders have been exposed to such concepts as a basin-wide organization for water management and a National Water Resources Authority, due to efforts of the Sri Lanka Water Partnership and the ADB National Water Policy project, respectively. “A water decision-maker should be an island!” explained one DOI manager. Another echoed a similar sentiment by explaining that, given the small size of Sri Lanka, all water resources decisions should be made out of Colombo. The NWSSB, however, had been very interested in the concept of joint management of water resources.

Much of the concern over the ADB National Water Policy Project relates to concern over payment for water. The draft document contained an appendix that gave an example of registration requirements for both public and private water sources that included a reference to billing. This was interpreted to mean that all water, whether from public and private sources, would be subject to payment to the government. The issue was picked up by the national press and NGOs and a major debate erupted over “external interference in Sri Lanka policy” by ADB that set back the entire proposal package.

For their part, many communities responded to the notion of a basin-wide forum with skepticism. The predominant concern expressed involved expenditure of time. Many suggested that they do not have enough time to offer input into water management decisions. They prefer instead to deal with problems on an as-needed basis.

This preference for water decision-making “by fire” was commonly suggested, and parallels existing approaches to addressing potential water conflicts. The DOI, Kataragama officials, and many basin stakeholders suggested that they should continue to deal with potential water conflicts according to existing practice. At present, when a significant problem arises, concerned parties can raise the issue with the District Authority (DA). As appropriate, the DA calls a public forum to address the issue of concern. In some ways, this practice mimics some of the important social networks at the village level, such as that of the funeral society. The organizational structure exists, but the society lies dormant until some dies. Unfortunately, when applied to watershed resources decision-making, such a responsive structure does not enable alternative and conservation approaches to develop that mitigate the demands on the limited water resource base.

#### **4.2.4 Institutions and Governance**

Sri Lanka is characterized by a top-down government system that reaches from the national to community level. It is centralized in that line agencies have direct reporting relationships from national to local level, and, even though there has been a major effort to decentralize to provincial and district levels, the more technical agencies still work in a largely hierarchical manner. At all three government levels there are consultative coordination mechanisms, but the reality is that the more powerful line agencies manage to operate in a highly centralized manner. Because government legally owns land, water, and forests over much of the country, there is little opportunity for communities to play a major role in their management.

The Department of Irrigation, one of the older and more established government agencies, ensures that little information is made available (to other government agencies or to the public at large) concerning hydrology, water availability and water allocations, leaving it in monopolistic control of surface water allocations. It is able to promote new infrastructure developments by ensuring that each agency is under the impression that

its own interests will be met, even when they are actually in competition. The proposed Viharagala development is a case in point, where all concerned parties (Yala National Park, Kataragama temple, Kataragama urban water supply, the five tank system near Kataragama, and the Lunugamvehera farmers) all believe that their current water problems will be solved and that additional water will be available for them in the future. This is unlikely given the chronic water supply in Menik Ganga, where rainy season excess flows vary greatly from year to year. Each agency has different information on the design and the anticipated operating rules for the Veheragala structure. The DOI rarely divulges actual operating rules for infrastructure under their control, which further strengthens their control over surface water resources.

Similarly, the DOF and DOW are run from Colombo, with no scope for local variations in the implementation of different regulations. Fines and other sanctions are used as mechanisms to discourage people from entering forests for tree felling, hunting, or capturing wildlife, and the wildlife regulations apply throughout the country, not just in wildlife preserves. The manner in which these fines and sanctions are applied is arbitrary, further weakening the capacity of communities to negotiate more lasting settlements.

When the government makes decisions it does so without inputs from non-government agencies and organizations. Frequent transfer of officers ensures that people gain little specific local knowledge when they make decisions, and therefore follow the agency line rather than reacting to different cases differently. This system fosters a paternalistic approach whereby government believes it knows what is best for communities. There is little recognition that communities could have a legitimate stake in decision-making and almost no recognition that they should have such a stake.

This leaves the communities with a minimal role to play in management of natural resources. While we see many examples where adjacent communities have come to sharing both land and water resource mechanisms, communities play little role in overall resource management and the government does not expect this of them.

In other countries, the NGO sector provides a mechanism for communities to develop dialogue with government agencies, but in Sri Lanka we find that this has not developed to any significant extent. NGOs most likely to be concerned with natural resources management are those with primarily environmental interests, but, at present, these NGOs are still at the confrontation stage with government over almost all proposed developments. Most government officials view the environmental NGOs as deliberately disruptive and possessing limited technical understanding. There is some truth to this, because they do oppose most developments; entering into any form of debate over the relative merits and demerits of the proposal. It is possible that, over time, NGOs will play more of an intermediary role for the communities to pursue dealing with natural resources management issues, but at present this is not an option.

In a few cases, communities have identified local leaders who are willing to promote the views and interests of communities to access more water and land. The local leadership of the Lunugamvehera farmers is a good case in point. In other instances, the local clergy may get involved, such as the monk at the Kiriwewa temple tank near Kataragama lobbying for water tank or the bishops in coastal areas objecting to tourism developments.

But, in general, communities are forced to find other ways to get the attention of decision-makers, and the most common path is to involve local politicians. This runs the risk, especially at present, that support through political channels will evaporate if there is a change in government. Indeed, there have been four such changes in the past four years, made more difficult by a system of proportional representation that has reduced the direct linkage between a Member of Parliament and a specific constituency. Local communities are adept in getting politicians' attention and, if they can capture a minister's attention, they are likely to be rewarded with action because most ministers like nothing better than being able to direct a government agency to help a particular group.

In summary, we find a situation where there is a long tradition of dealing with individual crises as they emerge and some degree of resolution is normally found. However, the results are short-term in nature, local in

scope, and do not address the holistic nature of natural resources management required for sustainable development.

- Few, if any, efforts to come to negotiated win-win issues, so groups tend to be polarized.
- Rights are largely through customary usage, and compromise agreements over access are short-lived.

### 4.3 THE EFFECTS OF CONFLICT ON POVERTY

Conflict clearly impacts the level of poverty in Sri Lankan communities. Under the study, both those affected by the civil war and those affected by conflict over resource scarcity experience changes important to their prospects for overcoming poverty into the future.

The “Asset-based Approach to Poverty Reduction” utilized by USAID and the UK Department for International Development (under the title “Livelihoods Framework”) use a series of five “assets” to assess the scope of poverty in a community. These assets, considered critical elements of poverty reduction, include financial, human, social, natural, and physical capital. Key aspects of the relationship between conflict and each of these assets in the case study areas may be summarized as follows:

#### I. Financial Capital

##### Financial Vulnerability

In the Menik Ganga, poor water resource planning, management, and communication approaches impact stakeholders’ ability to engage in financial planning. They also increase stakeholders’ financial exposure. Many farmers of the Lunugamvehera reservoir irrigation system, for example, obtained private loans for house construction after the government allocated land to them under the Lunugamvehera irrigation system. When they were first obtaining the loans, borrowers and the lenders counted on future agricultural earnings for loan repayment. However, farmers did not receive water for two-thirds of the cropping seasons over the past 18 to 20 years. Their incomes, therefore, fell drastically short of predicted incomes, and many have been unable to repay their loans. The streets where families resettled under the “new” irrigation system are lined with skeletons of unfinished homes.<sup>13</sup> Many of the farmers are forced to take drastic measures in order to repay money borrowed for homes that remain unfinished. They “sell” their untitled irrigated plots of land to other farmers, and either leave the area or remain with no land on which to cultivate. With no access to livelihood resources, poverty intensifies.

Currently in the Menik Ganga River Basin, many stakeholders are susceptible to similar experiences. Most downstream stakeholders expressed high expectations for access to water for irrigation from the proposed Veheragala reservoir. As reservoir construction proceeds and the DOI or others make promises to them about future water for irrigation, they will be increasingly vulnerable to the financial traps experienced by Lunugamvehera farmers. Others who currently withdraw water from the Menik Ganga unchecked, particularly the “illegal” pump operators, are likely to have made financial decisions (such as borrowing money, planning for children’s education, etc.) against a future harvest earnings profile that is dependent upon water access. Since no water management entity currently takes note of the pump operators, they are vulnerable to losing their water extraction rights under future water management decisions.

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<sup>13</sup> Their experience suggests that access to income from children working outside the village is also limited. Some explained that while their children try to send money it is not enough to make the loan payments.

## **Financial Poverty of Young Adults**

Many young adults who live in the villages are experiencing more extreme conditions of financial poverty, because they have no accumulated capital and minimal access to income from outside sources and are establishing livelihoods based on marginally productive lands.

## **War and Income**

Communities affected by Sri Lanka's civil war have less financial income from traditional livelihood sources than before the war, due to increased restriction of access and, in cases affected by refugee populations, diminished resource supply. At the same time, most currently receive supplemental income related to the conflict. Many youth in villages on the fringes have become home guards; Yakaveva, a community of 106 households, has approximately 50 employed home guards. These guards are youth from the community who are paid low wages by the police to guard their home area. In addition to the home guard income of some families, most who have returned currently receive government subsidies related to their status as returning refugees. Both sources of income are not likely to sustain in the long-term. When they diminish, communities will experience a stronger jolt of financial need, exacerbated by reduced access to livelihood resources.

In the two villages where less than 100 percent of the families returned to their home village from their resettled location, those families who did choose to return were amongst the poorest of the village. In Old Eluwankulema and Yakaveva, most of those returning did not have access to irrigated land, whereas the majority of those who stayed behind had access to their former landholdings from their new location. This suggests that in a cease-fire period with tentative peace, the most financially vulnerable are more likely to return to a dangerous area.

## **2. Human Capital**

In the communities visited during the assessment, a knowledge and skills base exists for traditional livelihood activities. Most of these communities come from a tradition of shifting agricultural production in the forests, or fishing. Many, particularly in the Menik Ganga, have developed their livelihoods into more permanent forms of agricultural production, cultivating rice, fruits, or sugar cane. However, little opportunity for alternative income sources exists within the region; therefore, people are not trained to meet the demands of the economy.

This pattern appears to continue with the next generation. A small percentage of the young adults from the villages manage to attend a good university or technical school. Most of those who do receive such education leave the village for Colombo or abroad, so that some of their money, but none of their skill, supports their home area. Aside from the quality higher education available to a limited few, most skills development happens through on-the-job training. With limited job prospects, limited human capital for diversified livelihoods is developing for the future.

## **3. Natural Capital**

The natural capital of communities visited remains their most prized yet limiting factor. While current livelihood practices heavily rely upon the natural resource base, few community stakeholders expressed interest in diversifying these practices. Instead, they request consistent and/or increased access to the same natural capital in order to continue or expand their traditional livelihood approaches.

### **Changing Usage: Access Restriction**

Overall, their access to natural capital is increasingly threatened. Communities' perceived ability to continue with shifting agricultural production in the forests varies with location—in many areas, communities have been experiencing increased DOW and DOF enforcement of forest access restrictions. In others, communities feel relatively free to continue with traditional practices. Those communities who have been exposed to increased enforcement express great concern over future access to the forest. The 'traditional'

villages were very animated in their request for assistance in negotiating future access to the forest. This, they explain, is in fact the only form of assistance that they want.

### **Changing Usage: Industry**

Actual patterns of forest use for livelihoods may be changing not only due to increased restriction, but also due to changes in land-based industries. In the middle watershed of the Menik Ganga, increased purchasing/processing rates of PSI may have increased the number of peasants clearing middle watershed land for sugar cane production. Since PSI privatized in the late 1990s, the industry has increased the volume of annual sugar processing by 4 times, from 150,000 to 600,000 tons annually. Seventy percent of the land under sugar cane cultivation for the industries is cultivated by small-scale farmers off of the plantation property, many of whom cultivate on encroached government land in the middle watershed. Meanwhile, in the upper Menik Ganga, opportunities exist for increased community involvement in reforestation efforts on lands that will not continue under tea cultivation, as the industry continues to suffer decline.

### **Changing Usage: Population**

Naturally, population increases within a given area intensify demands on its natural resource base. The effects of this are clear in areas of refugee settlement in the north, where refugees have access to the natural resource base; supplies have greatly diminished. Similarly, in the water-stressed river basin, increasing demands will continue to affect resource users who rely on the water for their livelihoods.

As population grows and limited alternative forms of income develop, an increasing number of people are dependent upon marginally-productive lands for survival. Many young families who do not leave the rural areas expand production onto less productive lands. In some cases, the local government (JVP party) supports them in doing so, as in the case of young families who have been given marginal land between Kataragama and Lunugamvehera (see pictures on page 17).<sup>14</sup> As they clear scrub land in the Dry Zone that was previously deemed unsuitable for cultivation, they remain extremely vulnerable. Without alternative sources of income, dry years of marginal agricultural production will push these families further into the cycle of poverty.

Such situations increase Sri Lanka's vulnerability to future destabilization. These families' experiences of poverty, combined with the fact that they are recipients of political favors from a minority and extremist party, make them good candidates for recruits in future violence.

## **4. Physical Capital**

Access to physical capital varies between the different communities visited, and it often bears a direct relationship to issues of financial capital, as mentioned above. In war-affected communities visited, NGOs have assisted communities with physical capital for homes and drinking water supply. Where level of productive physical capital varies within a community, there is a direct relationship between access to physical capital for production and income level. For example, farmers along the river who have managed to purchase pumps have dramatically improved yields and, over time, incomes. They explain that while some rent their pumps to other farmers they often do not have time to share. In such cases, those who do not own the physical capital for production are much less financially secure. Nonetheless, when asked to express their concerns for the future, none of the communities interviewed mentioned a strong desire for physical capital. All placed a much stronger emphasis on their desire for secured access to the natural resource base.

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<sup>14</sup> Many of their heads of households served in the JVP armed forces and have been given new marginal land by the party in return for their support.

## **5. Social Capital**

### **Protection**

In communities of the conflict zone, social capital has helped to preserve livelihoods by preventing resource capture. Communities explain that their relationship with neighboring villages was a strong factor in securing traditional land rights. Neighboring community members who were not exiled by violence are related to those who did leave. Those remaining in nearby villages were thus aware of their relatives' intention to return, and did not take over their territory.

Those who became refugees in areas near their original villages benefited from the presence of friends and relations in their new refugee settlement. Communities explained that, after the cease-fire agreement, those who stayed in the area of resettlement tended to be those with family nearby. People who did return to the original village may have less familial 'social capital' to help support them in times of duress.

### **Organization and Leadership**

Social institutions at the community level exist, though often as latent organizational structures that mobilize in times of need. Some of the strongest among these include funeral societies and temple societies. Other organizations, often formed under the DOI or the Department of Agrarian Services, address practical decisions within an irrigation or cultivation system. Community interviews suggest, however, that the sample communities have limited experience with sustained social organization, leadership, and local representation around watershed resources rights and management. While existing social structures may be tapped for this purpose, to date, most have not been. When discussing this, many communities expressed frustration over lack of existing representation. They convey a low level of experience with organization and leadership to promote their resource interests, channel resource management-related information between the community and other stakeholders or decision makers, and engage in conflict prevention dialogue with other stakeholders.



# APPENDIX A. CASE STUDIES

## SET I: THE EFFECTS OF CONFLICT ON WATERSHED RESOURCES AND LIVELIHOODS

### Background

Information for the case studies and summary statements presented here come from focus group sessions and interviews held in the North Central Province (NCP), which lies on the fringes of Sri Lanka's conflict zone. Hydrologically, the NCP is located in Sri Lanka's Dry Zone, receiving approximately 1200 mm of rainfall each year. The team selected the specific villages with input from authorities familiar with issues in the area, a technician who works throughout the region, and local residents of the basin who helped direct us to specific villages. The three presented, Yakaweva, Old Eluwankulema, and Pivapamaduwa represent a range of issues experienced by people who live on the fringes of the conflict zone. Key variables affecting the conditions of conflict resource management, such as refugee settlement location, community ethnicity, and post-conflict access to resources differ between the villages studied. Together, they provide a glimpse into the watershed resource issues that are common, as well as those that are unique to specific groups of people, on the fringes of the conflict zone.

### EFFECTS OF CONFLICT ON WATERSHED RESOURCES AND LIVELIHOODS

	OLD ELUWANKULAMA	YAKAWEVA	PIVAPAMADUWA
<b>Number of households, pre-war</b>	106	130	40
<b>Number of years away</b>	7	3	10
<b>Percent of households returned after the conflict</b>	33%	100%	50%
<b>Similarity amongst those who returned</b>	Mostly the landless	All returned	Poorer community members
<b>Distance between refugee settlement and home village</b>	< 5 km	15 km	4 km
<b>Primary livelihood practice</b>	Fishing (70%)	<i>Chena</i> (100%)	<i>Chena</i> (almost 100%)
<b>Additional livelihood practice</b>	Irrigated paddy Non-timber forest products (NTFPs)	NTFPs	Irrigated paddy, NTFPs
<b>Effects of war on watershed resources</b>	Significantly reduced fish populations due to pressure from refugees Forest ravaged from exploitation during civil war Improved water supply (NGO)	Few long-term impacts Repairable destruction to homes and home gardens by elephants Improved water supply (NGO)	Limited access to forest resources remain, due to continued fear of violence Natural rejuvenation of resource base from reduced human use
<b>Other changes in watershed resources</b>	Reduced access to forest due to increased enforcement	Reduced access to forest due to increased enforcement	New access to teak plots from DOF

## Case I: Old Eluwankulama

### Overview

Old Eluwankulama lies in the Kala Oya River Basin, near the Putlam Lagoon in the NCP. Though the Liberation Tigers of Tamil Eelam (LTTE) attacked the village on more than one account, villages that are less isolated and therefore safer lie only a few kilometers away from Old Eluwankulama. Watershed resources that play a critical role in the lives of Old Eluwankulama residents include:

- The Putlam Lagoon, the nearest point of which lies approximately 2 km from the village;
- The forest and resources of the Wilpattu National Wildlife Reserve and its buffer zone; and
- A nearby small tank irrigation scheme that members of three villages, including Old Eluwankulama, share.

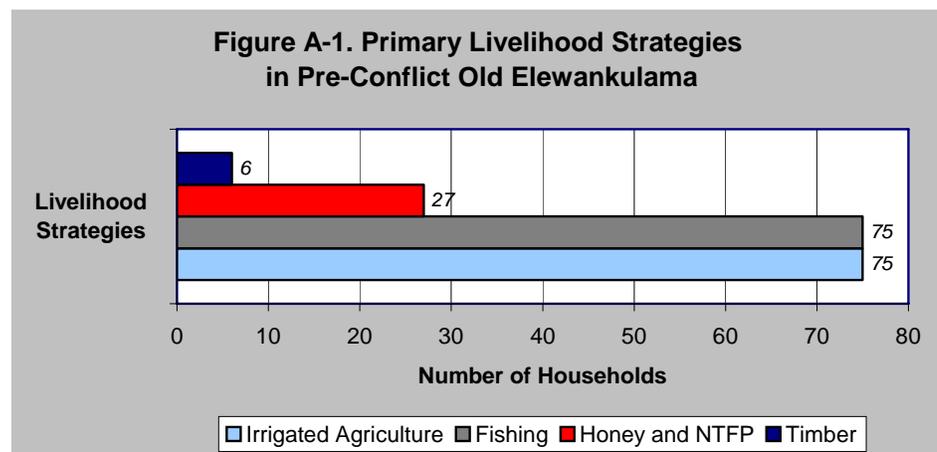
Residents of Old Eluwankulama include members of various ethnic and religious backgrounds. People of both Tamil and Sinhalese origin live in Old Eluwankulama, with Tamil residents making up the majority. Similarly, a variety of religious beliefs coincide in the village, including Muslim, Tamil and Christian.

### Village Profile

Prior to the civil war, Old Eluwankulama consisted of 106 households. Most people of Old Eluwankulama were fisher folk. At this time, approximately 70 percent of Old Eluwankulama families relied upon fishing from the Putlam Lagoon as a primary livelihood strategy.

Most families supplemented their fishing income with paddy production under a nearby small tank irrigation scheme. Other livelihood strategies in Old Eluwankulama included collection of bee-honey and non-timber forest products (NTFPs), as well as timber harvesting (see Figure A-1).

All 106 households evacuated after an initial attack by the LTTE in 1993. One year following, the government helped families to resettle in their home village. However, the LTTE attacked Old Eluwankulama again in 1995, and community members once again evacuated. In 2001, again with government assistance, 15 families of Old Eluwankulama opted to return to their original village. As of November 2004, 35 families of the original 106 have returned to Old Eluwankulama.



## The Effects of Conflict on Watershed Resources and Poverty

The community of Old Eluwankulama is more vulnerable to poverty than before the war for a variety of reasons. These include a reduction in their access to livelihood resources, and the fact that returnees were among the poorest members with the least land holdings.

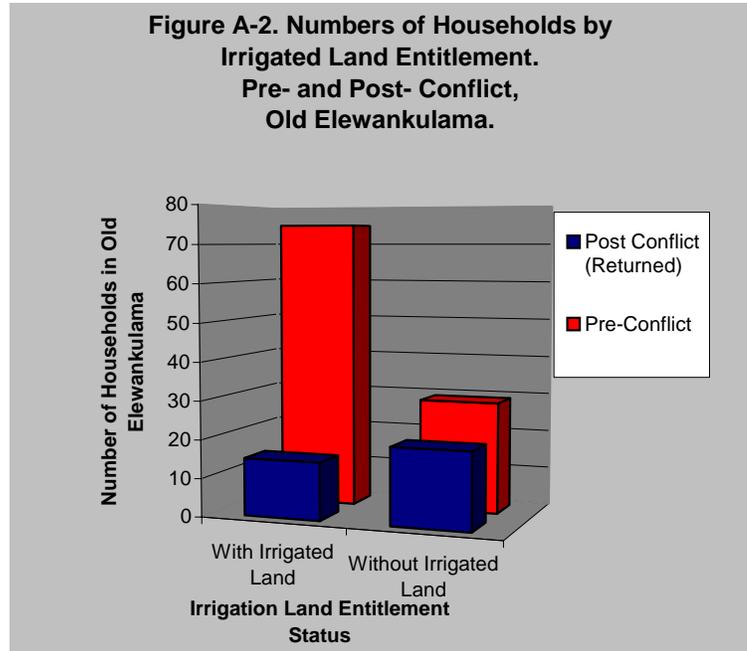
Indicators suggest that the poorer members of the original village returned to the home area. As Figure A-2 shows, community members who do not have access to irrigated land returned at a much higher rate. Those with access to irrigated land continue to farm this land while living in their nearby refugee settlements.<sup>15</sup>

In the post-civil war period, the people of Old Eluwankulama have less natural resources available to them than before for reasons, as described below, that are both conflict and non-conflict related. Because of the deterioration in villagers' traditional livelihood strategies, they rely on alternate, weak sources of income that include work as day laborers and government subsidies.

Community members explain that fish stocks in the lagoon have dramatically decreased since the pre-war period. Old Eluwankulama villagers attribute this reduction in fish stocks to population pressure brought upon by refugee settlement. Refugee communities that have settled near the Putlam Lagoon include fisher folk, primarily from the east coast, who continued to pursue their traditional livelihood activities in their new settlement area. In addition, the refugee communities compete with local populations for agricultural production on encroached government land. Based on the history of the relationship between refugees and original settlers, no organized conflict is likely to erupt between the two groups. However, their competition over resources results in tension between the original villagers and the refugee communities.

During the civil war, timber felling and wildlife hunting in the Wilpattu National Reserve became rampant. The LTTE used Wilpattu as a base for operations, and authorized forest exploitation by LTTE collaborators. Interestingly, although the community's forest resource base was exploited during the war, they express greater concern over the government's restrictions on access to the park than with the exploitation. Following the recent cease-fire agreement, the Department of Wildlife increased restrictions on monitoring and staff for the Wilpattu reserve and its buffer zone. Nearby community stakeholders contend that the existing enforcement is much stricter than pre-conflict enforcement.

The people of Old Eluwankulama contend that a select subset of wealthier "outsiders" still engage in illegal hunting and timber harvesting. Whereas these outsiders are guaranteed respite from government punishment for illegal harvesting, the poor residents of Old Eluwankulama lack the financial resources and personal connections necessary to protect them from the DOW's fines. As a result, Old Eluwankulama villagers access the forest resources much less than before, and if they do, it is under risk of punishment.



<sup>15</sup> Certain subsidies or housing assistance associated with relocation may have encouraged poorer community members to resettle in Old Eluwankulama.



Community Members of Old Eluwankulama.

According to residents, the conflict has not noticeably affected irrigated land access, quality and quantity of water available. However, as suggested above, only 15 of the 35 returning households have access to this irrigated land under the original landholding system. With limited access to traditional livelihood resources, most Old Eluwankulama residents currently work as day laborers on nearby farms for needed income.

Water supply sources in Old Eluwankulama have slightly improved during the post-conflict resettlement period, with NGO assistance in new well installation. Though these wells dry up in the dry season, no notable negative changes have been found in water supply quantity or quality as an indirect or direct result of the conflict.

## Case 2: Yakaweva

### Overview

The village of Yakaweva lies in the NCP of Sri Lanka, in the Yan Oya River Basin. Residents refer to Yakaweva as a traditional *vedda* village, complete with ancient ruins and families that have been living with the area's resources for countless generations.<sup>16</sup> All members are Singala and display strong social ties. Many young adults remain in the village. The village is situated approximately 20 km within the conflict zone. All members are of Sinhalese ethnicity and Buddhist religion.

Watershed resources that play a critical role in the lives of Yakaweva residents include:

- An extensive amount of nearby National Forest land;
- A small tank irrigation scheme; and
- Groundwater wells for potable water use.

### Village Profile

Prior to the civil war, Yakaweva consisted of 130 households. Shifting cultivation, or *chena*,<sup>17</sup> was the primary livelihood strategy for the people of Yakaweva. One hundred percent of the Yakaweva village households were engaged in shifting cultivation before the conflict. Their strong reliance on *chena* agricultural production was the result of several factors, including: 1) *chena* is a traditional livelihood practice for the *vedda* people; 2) large tracts of forest border the community; and 3) Yakaweva is located approximately 15 km away from markets in Vauniya town, where they sell grains and produce. Other livelihood strategies of old Yakaweva were similarly forest-dependent. These included the collection of bee-honey for sale in Vauniya markets and hunting. Some have assisted permitted hardwood harvesters as paid laborers, and some work as farm laborers during times of drought. All community members harvested forest timber for construction of their homes.

A small tank system existed in the community, but only 50 households had (and continue to have) access to land under this system, representing about 38 percent of the total number of households in the village. Their plots are small and fragmented, with individual parcels as small as one-eighth to one-tenth of a hectare in size. Cultivation under this system was not sufficient for sustenance, and all members with land in the irrigated system also engaged in *chena* agriculture.



Community Members of Yakaweva.

<sup>16</sup> *Vedda* are the last descendants of the ancient inhabitants of Sri Lanka. They have not preserved their own language and currently resemble rural Sinhalese.

<sup>17</sup> *Chena* is an agricultural production practice in forest lands that entails clearing a patch of forest, cultivating agricultural products on that patch, and moving to another patch the subsequent years. In northern Sri Lanka, *chena* farmers return to the original plot of cultivated land, thus repeating the cycle of plots, approximately every fifth year.

In 1998, Tamil guerillas attacked a neighboring village, killing 3 residents and 15 members of the armed forces. In the following day a security point of Yakawewa was also attacked and 3 home guards<sup>18</sup> killed. As a result, all 130 families of Yakawewa fled the village, and ultimately settled in a refugee camp 15 km away from Yakawewa. Community members were afraid to return and remained away from their homeland for 3 years.

As refugees, the Yakawewa community members were not engaged in traditional natural resource-based livelihood activities. The government required that they stay on the refugee camp, located away from a forest resource base, in order to receive subsidies. As a result, Yakawewa refugees depended solely on government subsidies for survival, and have stayed together as a close-knit group. They anxiously awaited a safe return to their homeland, and a return to their traditional livelihood systems.

### **The Effects of Conflict on Watershed Resources and Poverty**

The civil war did not have a direct, irreparable physical impact upon the watershed resources important to the livelihoods of Yakawewa residents. When villagers arrived back in their homeland approximately three years after departure, they found no noticeable depletion of the resource base aside from damage to their home gardens (noted below). They describe very little interference with their forest plots. Similarly, the conflict left no longstanding irreparable impact upon the tank system and Yakawewa families' access to its water and land resources. It did cause damage and require significant repair work, as natural growth resumed in previously cleared fields, and elephants used the tank for drinking water. Access to potable water has improved as an indirect result of the conflict, as NGOs entered the community to assist with resettlement and provided new wells for potable water supply.<sup>19</sup>

One temporary, indirect effect of the conflict involved destruction of property. Elephants destroyed home gardens (including fruit trees) and many houses and basic infrastructure. While an NGO and the government have assisted residents in reconstructing homes, their home gardens are still recovering. Villagers' access to fruits of previously established trees is thus limited.

Villagers explain that outsiders did not attempt to capture the resources utilized by the Yakawewa community for several reasons. First, others recognize this as a traditional village belonging to Yakawewa residents. Additionally, the people in adjacent villages are relations, and kinship ties prevented them from intruding on the forest and land that their kin had been managing. Finally, fear of LTTE-incited violence in the area kept other outsiders at bay. Because humans abandoned the area, the natural wildlife-forest interaction began to reestablish itself in Yakawewa village proper.

The people of Yakawewa could not go to their *chena* fields, located approximately 6 km away from the village of Yakawewa, until the signing of the cease-fire agreement. To date, cultivation in some areas of the forest is considered dangerous, and farmers travel to the fields in groups.

There is little indication at present that the resource constraint will result in an out-and-out conflict over the resources themselves, although isolated incidences of individual disputes have occurred (such as disputes over access to a marked beehive for honey collection) and will continue.

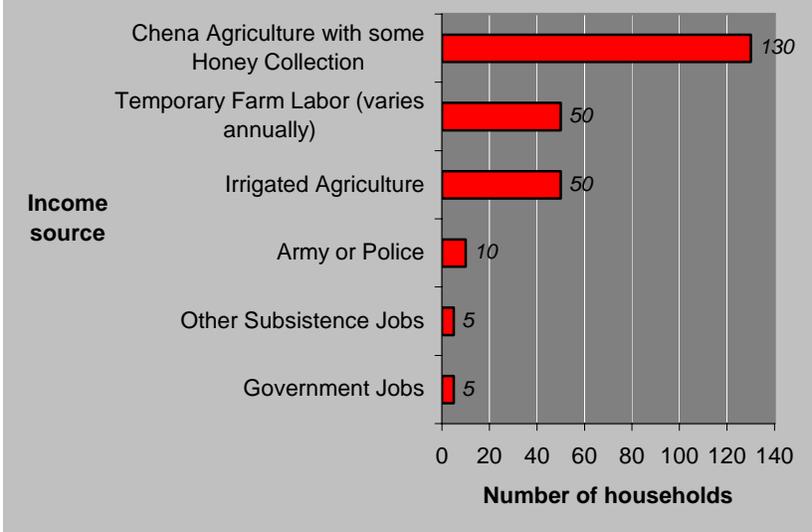
More significantly, access to the forest for shifting cultivation and bee-honey collection is under increased restriction in this area, thus impacting the one means of income generation practiced by every household in the community (Figure A-3). Since the signing of the cease-fire agreement, they contend that the DOF has increased enforcement of restrictions upon non-permitted use of the forest resources. The restrictions have been long-standing, but were not strictly enforced in the past. Yakawewa residents' fears of the DOF are

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<sup>18</sup> Home guards are the youth of a given war affected village, appointed by police to protect their own villages from LTTE. They are paid minimal wages by the police, and have bunkers established around the village, and protect it day and night.

<sup>19</sup> During drought times, these wells run dry. Yakawewa residents must then use the local tank for potable water, as was their standard practice prior to NGO intervention.

**Figure A-3. Income Sources  
by Number of Households Receiving,  
Yakaveva**



directly tied to a recent incident in a neighboring community, in which the DOF took three people to court for engaging in shifting forest agriculture. Though the farmers are afraid, they continue this practice since they have no other income generation opportunities.

These restrictions are the community’s primary concern at present. Most households (62%) have no land for cultivation elsewhere, and all families have engaged in shifting agriculture as a primary livelihood strategy for generations. As Figure A-3 indicates, some households have an alternate, low-paying source of income, but all rely on shifting cultivation as a primary

livelihood strategy. They strongly express that they do *not* want physical infrastructure or financial assistance from outsiders; they *do* want assistance in acquiring rights to utilize the forest resources and continue with their traditional livelihood practices. Although NGOs including World Vision and SAVA Lanka have assisted them with physical infrastructure, they suggest such assistance is unimportant relative to the issue of forest access. At present, villagers display a fear of punishment from the government and a sense of helplessness against those who call upon greater financial resources and political connections to exploit the forest resources. Yakaveva residents are, however, aware of the importance of forest conservation for watershed preservation, which fuels the DOF’s restriction of access to the forests. One community member explained that “if the forest gets lost, there won’t be rain.”

## Case 3: Pivapamaduwa

### Overview

Pivapamaduwa is a small village roughly 10 km southeast of Vavuniya town. This area is at the northern edge of the Sinhalese portion of Sri Lanka. The village members are traditional *vedda* people whose ancestors have been in the area for many centuries. Although many neighboring villages are Tamil, there is no evidence that this contributed at all to the disruption caused by the civil war. Nearby Vavuniya town had an important strategic role during the civil war with bases of all three branches of the armed forces, and was the last town remaining in government control throughout the conflict on the A1 road northwards towards Jaffna.

Located in an area that saw considerable fighting and land mining during the civil war, Pivapamaduwa was abandoned for almost 10 years. As a consequence of this long evacuation, villagers have been slow to recover from the conflict. Conditions are markedly different now than they were before the war. Yet the study team finds little evidence of loss of control or access to natural resources.

### Pre-conflict Conditions

Pivapamaduwa was a small village with about 40 households. The majority of these households relied primarily on shifting agriculture and highland cultivation for their livelihoods, with only 5 families relying on paid labor on farms or in Vavuniya. The close proximity to Vavuniya meant that farmers were able to market crops in the town. Most grew vegetables, gram, millet, and other small grains for both cash sales and domestic use. Shifting agriculture was practiced on plots close to the village and on land some 5 to 6 km to the south. Some families supplemented their income through gathering forest products, notably honey, and there was limited hunting and timber felling for firewood. However, community members suggest that there had been sufficient upland and forest land to support the population without severe resource difficulties.

The village also had two small tanks. These were able to support a wet season (*maha*) crop most years and limited dry season cropping in some years. The tank lands were shared by all of the 35 households that also cultivated uplands, but holdings were very small and were used largely for household rice requirements. With a steady income from vegetable and grain sales in Vavuniya, rice cultivation was less important to villagers than in more traditional villages.

### Disruption Due to Conflict

Pivapamaduwa itself was never attacked directly. However, it was adjacent to a large army camp that was first attacked by the LTTE in 1992. In this attack some 13 army personnel were killed and the fighting passed through village lands. Frightened to be adjacent to a ready target, the villagers all fled to Kachchimaduwa, a neighboring village some 2 km to the east. Villagers felt safer in this village, as it was a larger community with about 400 households, and many people had friends and relations there. For two days they took shelter in the village school and then were moved to the local temple with army protection.

Recognizing that it would be dangerous to return, community members began to search for livelihood activities. They were initially allowed to cultivate some temple lands while based in the temple, growing highland crops for consumption and sale in the area. This made some of the families reluctant to return because they had begun to establish themselves in their new location.

Until the cease-fire no households returned to Pivapamaduwa. It was considered too dangerous because of its geographic isolation in the forest and proximity to the army camp, where other incidents had occurred. In addition several areas had been mined and there was uncertainty about where these mines were. Some villagers did return to inspect their homes, most of which had fallen into disrepair and had been damaged by elephants and monkeys, while most of the cleared land had become secondary scrub.



Sign warning of land mines on the road to Pivapamaduwa.

The conflict inspired some community-based depletion of the forest resource base. Because they realized there might be no quick prospect of return to Pivapamaduwa, many of the landowners felled the more valuable trees on and near their homesteads for sale as timber. They were concerned that either through neglect, damage by wild animals, or felling by others they would lose the value of these trees. However, they said that no outsiders tried to cut timber or take over their land. They felt this was because the area was always seen as belonging to Pivapamaduwa and that fighting in and around the area deterred others from taking over their property.

### Post-conflict Developments

Once the cease-fire became active, the Ministry of Rehabilitation offered the villagers a deal. Everyone was offered a small parcel of land in Kachchimaduwa village on which they could undertake some highland cultivation. They were also given the option of a basic house to be constructed on that parcel of land or Rs. 25,000 and a tent to enable them to return to their original homes and re-establish their livelihood there.

This choice split the solidarity of the original community. Some households felt they had become members of Kachchimaduwa village and did not wish to leave. They had established themselves as farmers and were able to make a reasonable living, their children were established in the local school, and they felt that they had better facilities and communications living in a larger community. Others wished to return to their original homes although they foresaw hardships in getting re-established on lands and in homes that had been abandoned for more than 10 years.

Approximately half of the households returned. They have started to restore homes, are establishing a small pre-school, and are working the highland areas close to their homes. However, they do not go to the more distant shifting agriculture lands because of danger there from land mines. The army claims the areas have been completely cleared of mines, but villagers claim to have seen unexploded ordinance at the surface following rains.

The DOF, in efforts protect the forested areas, offered returning villagers a share of a parcel of land newly planted with teak trees. Each family was allocated a 1 ha portion of the 25 ha planting. By giving people a valuable plot of teak plantation the DOF hopes to limit shifting cultivation on forest reserves once the trees reach a size where they can provide income to the owners.

Community members suggest that all land holdings are still identified with their original owners, and that those who have returned only cultivate those lands that belonged to them. This is true for highland as well as the land below the small village tanks. However, it was not possible to verify this assertion in the course of the study.

## The Impact of Conflict on Natural Resources

The intensity of the conflict in and around Pivapamaduwa meant that there was little risk of land being taken over by others. Trying to live in a small community close to an obvious LTTE target was unattractive both to original inhabitants and to outsiders who might want to move into the area. People felt safer in larger communities away from the immediate area of fighting.

Those who wished to return found themselves able to utilize their former highland areas without also having to go to their more distant *chena* lands. The two small tanks still function, although it appears they command a small area not critical to village survival. The conflict had a positive impact on the resource base, allowing soils up to 10 years with no cultivation.

Greater pressure appears to have been placed on lands in and around Kachchimaduwa. There was a net influx of some 25 families who were able to get about half a hectare each of highland. These lands had traditionally been *chena* lands for the original inhabitants of the village, but there appears to have been no opposition to the immigrants as they had close ties even before the conflict started.

We can only conclude that there were sufficient resources available between the two villages that there could be a readjustment of population and redistribution of land that did not lead to any major conflict between the two communities. Further, all communities in the area suffered during the civil war and there was sympathy for those who were most affected. The two communities of Pivapamaduwa and Kachchimaduwa were closely linked before the outbreak of violence, so there was less social disruption than if refugees had had to move to a more distant location as was the case in Yakawewa.

It appears that the DOF has tried to limit access to forested areas that were used for *chena*, NTFP collection, and hunting. It does not seem this is directly related to the post-conflict situation because the department seems to be more active in trying to protect forests. The offer of teak wood lots seems to be a specific effort to offer villagers a cash-oriented incentive not to undertake *chena* in forest lands, but it will take some years to see if this incentive really works as teak is a slow-maturing tree. With a returning community of only 20 to 25 households, pressure on forest resources adjacent to Pivapamaduwa is likely to be low for some time, and it may take one or two decades before the village reaches its original size.

Like Old Eluwankulama, the conflict split a community. It appears that better-off families chose to stay in the new locations with better schooling and other facilities, leaving poorer families to return to their old lands and try to re-establish their former community. Their natural resource base does not seem to have suffered to any great extent, although the community facilities and services are definitely less than before.

## SET 2: CONFLICT OVER WATERSHED RESOURCES

The Menik Ganga is one of the last perennial rivers remaining in the Dry Zone of Sri Lanka that has not had some form of regulation or diversion. There are only two significant settlements at Buttala and Kataragama, neither of which has substantial population and no major diversions for irrigation or other land uses. It is considered systemically water-short yet because it still has perennial flows, has been viewed as a potential for additional development.

The neighboring catchment of Kirindi Oya was developed significantly in the 1980s with the construction of Lunugamvehera reservoir. Prior to that, the ancient *anicut* serving the five tanks around Tissamaharama was the only major water diversion. The Lunugamvehera system was strongly promoted by the DOI who had been upset that the major design and construction activities in Sri Lanka had been given to the Mahaweli Authority. They felt they Lunugamvehera would show their engineering prowess and be an example of how to design construct and finance reservoir development using only national resources.

Unfortunately, the Kirindi Oya system has been a major embarrassment for the DOI as the reservoir has rarely filled up. The existing five tanks managed to secure more or less permanent rights for two crops a year (34 crops in 18 years, a better cropping pattern than they had been able to accomplish when there was no reservoir due to periods of low flow in the dry season) while the new expansion areas developed on traditional settlement pattern lines have only had 12 crops in 18 years. To mitigate this embarrassment, the DOI has longed been looking to opportunities to divert Menik Ganga water to Kirindi Oya to supplement the natural flows of the Kirindi Oya catchment. Farmers from Kirindi Oya have helped to push the department towards a speedier implementation of this transbasin diversion proposal.

However, Menik Ganga is drier and more subject to dry season water deficits than Kirindi Oya, so any diversion can only be in the wet season. Further, the Kataragama festival, which requires adequate water for religious affairs, is a national event. Pilgrims come from all over Sri Lanka in hundreds of thousands, and the lack of water for the festival in recent years has also become a national issue.

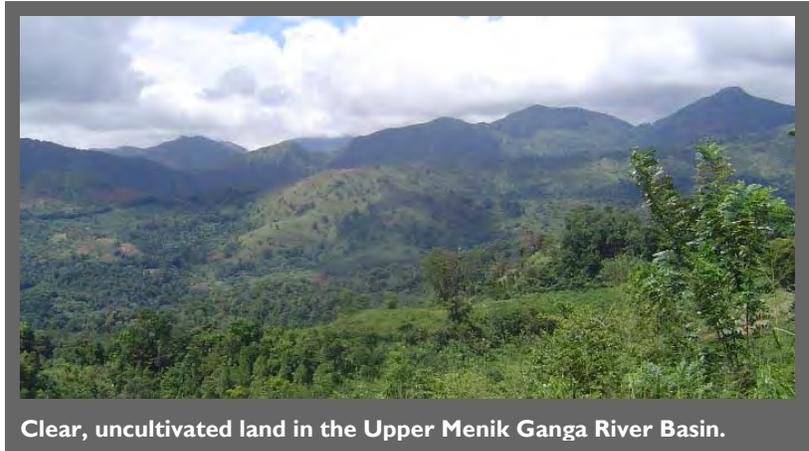
Menik Ganga therefore provides an excellent opportunity to examine in more detail the interactions, not only from head to tail of a basin, but also the competition for water between different sources, including the possibility of transbasin diversion. For this reason, the team visited several different sites along the Menik Ganga to obtain information and views on the current and potential water situation.

## Case 4: Finlays Tea Plantation

### North of Badalkumbura

#### Background

Tea plantations make up approximately one-eighth of the upper Menik Ganga catchment area. The British converted much of this fully-forested area into plantations following colonization in 1815.<sup>20</sup> Following independence in 1949, the Sri Lankan government operated the plantations for over 30 years. In the 1980s, the government privatized these plantations with the expectation of improving their productivity, while maintaining ownership of the land. In many cases, privatization led to intensification of production and increased stress on upper watershed resources. Plantation owners operating on leased land had little long-term incentive to invest in soil and resource conservation approaches.



Clear, uncultivated land in the Upper Menik Ganga River Basin.

Finlays Tea Plantation is one of the tea estates of the Upper Menik Ganga. Finlays plantation management explains that their business has been struggling over the past decade. They attribute this to two factors:

1. Tea prices have steadily declined relative to the cost of tea production;<sup>21</sup> and
2. The productivity of the land has decreased, resulting in reduced tea yields per acre cultivated. Although the tea plantations are the only major employers in the upper Menik Ganga, Finlays is not able to pay competitive wages to its workers.<sup>22</sup> Its plantation laborers rank among the lowest paid wage laborers in the basin. Finlays' experiences are part of a trend observed in Sri Lanka's struggling tea industry over the past 10 years.

#### River Basin Resources Use and Conflict Scenario

Major watershed resources issues related to the tea plantation include vegetative coverage in the upper basin, and water quality. Finlays, as in all other tea plantations in the hill areas, does not irrigate their tea, and therefore water consumption is not a significant issue. However, vegetative coverage changes are in fact taking place. Most of Finlays' land is not under tea cultivation at present. Of the plantation's total 1,000 ha of land holdings, Finlays cultivated tea on only 378 ha in 2004. Under current circumstances, Finlays does not deem additional tea production profitable. As a result, the company intends to plant rubber and hardwood on

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<sup>20</sup> About one-third of the country's land area falls under hill country and most of the rivers originate from the hill areas of the country.

<sup>21</sup> According to Finlays, ten years ago, plantations sold tea for about Rs. 20 per kilo and paid about Rs. 23 per day for one laborer. Today, they sell tea for about Rs. 200 a kilogram and pay about Rs. 150 a day for one laborer.

<sup>22</sup> Finlays' daily laborers earn Rs. 150 a day on the plantation, whereas other farm laborers in the basin earn Rs. 200 a day.

some of its fallow land. The plantation does intend to harvest the hardwood trees and will have to seek approval from the Ministry of Forestry to do so when the time comes.

Other Menik Ganga river basin stakeholders express grievances against the tea industry's use of upper watershed resources. These grievances include:

- Clearing of upper watershed vegetation that contributes to siltation. Menik Ganga stakeholders echo a common grievance of various groups in Sri Lanka (including donors, environmental NGOs, and the DOF) with complaints that tea plantations both directly and indirectly contribute to siltation. They directly contribute by maintaining vast stretches of cleared upper catchments and indirectly by paying low wages that result in subsistence livelihoods and therefore exploitation of forests.
- Finlays contributes to water pollution. Other Menik Ganga stakeholders have specifically named tea plantations as direct contributors to water pollution through application of chemicals to tea. Tea plantations have come under criticism for their indirect contribution to water pollution by paying low wages that do not allow laborers to build proper homes and sanitation facilities. Many tea plantation laborers' residences in the upper Menik Ganga line the river, with improper sanitation facilities releasing waste directly into the water system.

### Indications from the Case

Although river basin stakeholders often point fingers at the tea plantations, the plantations and their existing practices have been ongoing for many years, and are not likely to fuel overt conflict over watershed resources. Instead, Finlays' experience suggests that **options exist for reducing both the social tension and environmental stress caused by tea plantation practices**. As tea production becomes less profitable, other land use options, such as rubber plantations and forestry, may become more attractive. Sri Lanka's current policy, aided by the recently passed Upper Watersheds Policy, affords planters the right to use the trees they plant in degraded areas of the watershed. **Efforts to promote forestry and enhance vegetative coverage in the upper catchments may offer increasingly attractive options for communities and the private sector alike**. At present, however, much uncultivated land in the upper Menik Ganga that had been cleared for tea production remains unforested.

## Case 5: Koongahawewa Anicut Farmers

### North of Buttala

#### Background

North of the town of Buttala on the Menik Ganga River, the Department of Agrarian Services maintains 6 small *anicut* water diversion structures. These were constructed, in some cases, as upgrades from older, locally developed diversion structures, with assistance from the Department of Agrarian Services in the last 10 to 15 years.

One of these *anicuts* lies in Koongahawewa, where approximately 35 farmers share the *anicut*-irrigated area. Located in the middle section of the river basin, Koongahawewa borders national forest land. The group of farmers who irrigate under the Koongahawewa *anicut* is assertive about their rights to the water. This assertiveness is directly related to the fact that their fathers developed an original *anicut* at the site before the government upgraded this water diversion infrastructure. Farmers supplement their irrigated paddy with sugar cane production on encroached areas of government-owned highlands, the primary source of income for landless families in the area. Below the Koongahawewa *anicut*-fed irrigation canal, a small tank system provides irrigation waters for an additional 200 farmers.

#### River Basin Resources Use and Conflict Scenario

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Paddy fields irrigated by the Koongahawewa Anicut.

Water availability is a major watershed resource concern for farmers of the Koongahawewa *anicut* and neighboring small *anicut* systems. The farmers explain that their water resources are often limited during the dry season, leading to regular conflict with downstream water users. Several individuals and groups have interfered with the Koongahawewa *anicut* during dry periods. These include 1) farmers of the neighboring tank system, who open the Koongahawewa *anicut* when the tank runs low on water; 2) organized Buttala farmers and sugar irrigators further downstream, who remove the Koongahawewa *anicut*'s blocks when water runs short in the dry season; and 3) representatives of the

Kataragama festival, who come accompanied by police and army to ensure that the *anicut* does not block the flow of water to Kataragama in August (during its festival period). These interferences, particularly the first two, have led to turmoil and recurring conflict between farmers of the small *anicut* systems and downstream users.

Forest resources also play an important role in the lives of the Koongahawewa community. They explain that, while there have been no direct conflicts over forest resources, they have been perturbed by illegal hunters operating in the nearby forest. In particular, community members disdain the hunters' practice of burning the forest to chase animals and subsequently kill them. Though Koongahawewa residents have not experienced direct conflict with these hunters, they call the police whenever they realize that the hunters are operating.

## Indications from the Case

Koongahawewa *anicut* farmers clearly express regular conflict with downstream users over access to water resources. They are at a notable disadvantage because they are relatively small in number, and, unlike their downstream neighbors of the Buttala *anicut*, **management of water to their *anicut* is not part of the DOP's mandate**. With the ongoing trends of increasing water use in down stream portions of the river, mounting pressure on Koongahawewa farmers may be expected.

The fact that Koongahawewa *anicut* farmers perceive a “customary” right to the water due to their fathers’ role in developing the original *anicut* structure is important. It emphasizes **that the history of a group’s resource use animates their sense of right to that resource**, and it can motivate their position when confronting others over resource access.



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**Koongahawewa farmer leaders in animated discussion about experiences of conflict over water access.**

## Case 6: Buttala Left Bank Canal Farmers' Organization

### Buttala

#### Background

There are 2 major *anicuts* in the Menik Ganga under the auspices of the DOI. The Buttala *Anicut*, one of these, was originally built in 1871.<sup>23</sup> The DOI rehabilitated this *anicut* in 1993, and it now provides water to 640 ha of irrigated land, with 884 beneficiary families. Although the original *anicut* is over 130 years old, much of the currently irrigated land was not serviced until the DOI rehabilitated the *anicut* in 1993. The Buttala *Anicut* is divided into left bank and right bank canal systems. There is no land for further expansion of the irrigated area, because its fields abut the Pelwatte sugar plantation.

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Buttala anicut on the Menik Ganga River.

#### River Basin Resources Use and Conflict Scenario

All farmers of the Left Bank Buttala *Anicut* system irrigate and cultivate their fields during both *ala* (dry) and *maha* (rainy) season. Rice is the predominant crop cultivated. The DOI tried to introduce other crops to Buttala farmers in the past, but farmers resisted. Farmers explain that they were uninterested in diversification because the other crops would be more labor intensive. They also have minimal water scarcity-related incentive to diversify. Though they experience some

problems with water during the dry season, representatives of the Left Bank Buttala *Anicut* system express few complaints about water resource availability year round.

Farmers in the area have two sources of income: irrigated land and shifting agriculture. Until the original *anicut* was repaired in 1993, many of the families relied primarily on shifting agriculture for livelihoods.

#### Indications from the Case

The fact that Buttala *Anicut* farmers irrigate and cultivate rice in both rainy and dry seasons each year makes them both intensive water users and significant beneficiaries of Menik Ganga water resources. They express no perceived need to reduce the amount of water utilized. They are large in number relative to smaller *anicut* farmers groups upstream and well organized. These factors may give the Buttala *Anicut* farmers strength in situations of water access conflicts.

However, conditions may change for Buttala farmers as water demands increase downstream. Particularly, construction of the proposed Veheragala reservoir downstream could bring attention to the Buttala farmers'

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<sup>23</sup> The second *anicut* under the Department of Agrarian Services in the Menik Ganga, the Kuga-Galamuna, was constructed within the past two years.



**Buttala anicat left bank canal control structure and spill-over. Excess water released here returns to the Menik Ganga.**

water usage patterns. Menik Ganga water managers searching for water conservation options in the future may wish to further explore these farmers' perspectives on crop diversification, since they have already experienced and rejected diversification proposals.

## Case 7: Pelwatte Sugar Industries

### Pelwatte

#### Background

The Pelwatte Sugar Industries (PSI) are both major water users and major employers in the basin. PSI includes a sugar cane plantation, distillery, and processing factory. PSI lands are conveniently located between the Menik Ganga and one of its tributaries, the Kudu Oya. While PSI have been present in the basin for about 25 years, production, and therefore water use, markedly increased since the plantation privatized in the late 1990s. Since then, PSI raised sugar production from 150,000 tons to 600,000 tons annually. The industries currently employ 5,000 people as direct laborers, and they still experience labor shortage during harvest period.

#### River Basin Resources Use and Conflict Scenario

Pelwatte Sugar Industries currently use roughly 6,600 m<sup>3</sup> of water per day (see table below), according to recent studies conducted by Lanka Jalani (Sri Lankan wing of Global Water Partnership). PSI draws most of the water required for nursery irrigation and the distillery from the Kudu Oya, a tributary of the Menik Ganga. Water for the factory and 54 plantation “township” homes and facilities come from ground water and small reservoirs on the plantation property, though township water is supplemented with water from the Kudu Oya. PSI occasionally supplements the reservoir’s natural supply with water from the Kudu Oya.

PSI hopes to increase its water usage in the near future so as to address existing water constraints. In particular, management expresses an interest in additional withdrawals from the Menik Ganga. PSI is hoping to acquire additional water for uses that include the following:

- *Improved irrigation of the existing nursery.* In most years, PSI’s current withdrawals from the Kudu Oya for nursery irrigation fall short of demand during the dry season. The nursery requires 108,000 m<sup>3</sup> a month, and 1999 abstractions during the dry season months averaged 55 m<sup>3</sup> a month. In addition, in recent years, Kataragama officials have mandated the Industries to stop pumping water from the Kudu Oya in August. PSI relies on reservoirs and effluent ponds for supplemental nursery water, but these generally do not suffice, and nursery plants receive insufficient water for optimal growth.
- *Irrigation of new, expanded nursery lands.* PSI intends to convert land near the Menik Ganga that is currently fallow into additional nurseries. They would irrigate these new nurseries with direct withdrawals from the Menik Ganga.
- *Irrigation of some cane fields.* In order to improve the financial viability of the industry, PSI would like to increase annual production from its present rate of 600,000 tons to 1 million tons. Rather than expanding the number of acres under sugar cane production, they hope to increase yields on existing land. According to PSI, proper irrigation approximately doubles the sugar cane yield on land from 50

Water Use	Source	Water Used (m3)	Recycled to ponds (m3)
Nursery	River	3,857	-
Distillery	River	600	300
Factory	On-site pond	1,300	500
Township supply	Bore holes and river	800	-
<b>Total Daily Withdrawals, approximate</b>	<b>River</b>	<b>4,697</b>	
	<b>On site ponds</b>	<b>1,860</b>	

tons/hectare non-irrigated to 100 tons/hectare irrigated. The industry has begun to purchase some pumps for irrigation.

PSI's effects on water quality of the Menik Ganga relate to its wastewater and solid waste management approaches. Following mounting public pressure, Pelwatta Sugar Industries installed a wastewater treatment plant in early 2000 to improve the quality of wastewater that reaches the Menik Ganga River. In addition, the Industries use effluent from the distillery as biofertilizer on fallow lands, which runs to the river after heavy rains. However, as PSI cultivates more area, they have reduced the amount of fallow lands available for biofertilizer dumping. Land management practices and increased soil erosion associated with increased sugar production is another area of concern in the basin. By increasing its annual production, PSI may be indirectly contributing to upper river basin land use practices. Many of the small-scale farmers selling sugar to PSI cultivate on permanently cleared forestland of the upper river basin that had previously been under chena (shifting) agriculture.

PSI, as a large water user in the heart of the water-stressed lower basin, is regularly blamed for water resources scarcity and quality problems by downstream users. Stakeholders' complaints over PSI water pollution elicited a significant amount of public and media attention. The issue elevated until PSI constructed the wastewater treatment plant. Downstream communities contend that water quality has since improved, but still complain that PSI's biofertilizer runs into the Menik Ganga following heavy rains. Further, many members of downstream communities blame PSI for their biggest water quality concern of present: turbidity. They say that the river has become increasingly filled with sediment, and attribute this to PSI's cultivation practices.

The debate over PSI's water extractions also continues. Many stakeholders, in a forum sponsored by the Sri Lankan wing of Global Water Partnership/Lanka Jalani recently suggested that PSI increase its reliance on small reservoirs on Pelwatta property. Although this is not feasible, the industries do have one plan for improved water use efficiency at present. This plan involves the construction of a 25 mw biogas power generation plant, the wastewater from which could be used for irrigation<sup>24</sup>. It lacks financing at present, which must come from the private sector.

At the same time, PSI contributes significantly to the local economy. In addition to the 5,000 direct laborers, PSI supports outside cultivators, who grow the majority of the sugar processed by the Industries. In 2004, approximately 9,700 hectares of land was under sugar cane production for PSI. While 2,700 hectares of this land is cultivated on PSI-leased land by PSI-paid laborers, outside farmers cultivate the additional 7,000 hectares on forward contact agreements. .

### Indications from the Case

In the recent past, stakeholders have elevated their concerns over PSI to the level of public media attention. Though such attention can be an early indication of an escalating issue, there are no signs a present that protests against PSI will become increasingly violent. The imbalance of power between PSI and most stakeholders may help to keep complaints from becoming eruptive. Also, many poor communities who are heavily dependent on shifting cultivation rely on income gained from selling sugar cane to the Industries, or from direct labor for PSI. Disputes between the private sector, the Department of Agriculture, the DOW, and the WSSB over the issue of PSI water use, meanwhile, may "seethe," but are not likely to "erupt."

Downstream stakeholders' tendency to blame PSI for most of their water quality and quantity concerns illustrates a lack-of-information problem amongst basin stakeholders. Stakeholders are operating in a relative information void with respect to river basin resource usage and its consequences. Because PSI stands as one large entity in the basin, it serves as a target for blame in a way that dispersed resource users do not. The

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<sup>24</sup> The proposed 25 mw biogas plant would provide electricity to the plantation and factory. PSI would sell about 20 mw of that energy to the government.

repercussions of this may be illustrated in the issue of water turbidity: although PSI may contribute to increased soil erosion and sediment transfer, there is no information to substantiate the extent of their contribution vis-à-vis other land use practices further upstream. Without an understanding of how the range of upstream land use practices affect sediment transfer, stakeholders can easily blame PSI, effectively reducing the pressure to address other upstream land users. The relationship between increased small-scale sugar production in the upper watershed and soil erosion may warrant further investigation.

PSI's financial standing, which is currently not in strong, will be an important factor in its decision-making about investment in water conservation technologies. The Industries currently do not have access to partially subsidized loans that acknowledge environmental conservation in economic rate of return calculations. Instead, they are forced to turn to the private sector for capital, which charges market lending rates and bases loans solely on the financial rate of return. The cost-benefit of providing low interest financing to the Pelwatte Sugar Industries for conservation technologies could be further assessed as one option for improved water management in the Menik Ganga.

## Case 8: Pump Operators, Gonagan Ara

### Background

Thousands of unregistered pump operators pump water directly out of the Menik Ganga. This independent approach to irrigation has been a growing phenomenon in Sri Lanka over the past decade. Factors influencing this trend include the increasing availability of pumps to small-scale farmers, the scarcity of land under irrigation schemes, and lack of opportunity for creating additional irrigation schemes. Because the pump operators are not registered and their withdrawals do not come under any planned or monitored program, they add a new dynamic to water resource management in the Menik Ganga Basin. While most river basin stakeholders realize that these pump operators exist, the vast majority grossly underestimate the number of pump operators on the Menik Ganga. Gonagan Ara is one community where farmers operate unregistered pumps.

Farmers in Gonagan Ara estimate that 20 to 25 pumps, each 3.5 to 5 hp in size, line the Menik Ganga along their 2-mile stretch of the river. Gonagan Ara farmers cultivate relatively large plots of land that range from 2 to 5 ½ acres in size. While most have access to wells, they contend that these wells do not yield sufficient water to properly irrigate their fields. Farmers in the area began purchasing these pumps 8 to 12 years ago. Today, they primarily grow commercial crops such as banana, lime and coconut. Previously, they relied on *chena* (shifting agriculture), but lately they have become increasingly reliant on commercial crops. They explain that their move away from *chena* toward commercial crops is the result of two factors: reduced rainfall, and reduced access to land. In the highlands, they also cultivate rain-fed sugar cane<sup>25</sup>.

### Watershed Resources and Tension Scenario

There is currently little tension on the pump operators, although they extract a significant amount of water from the river. Based on the study team interviews with other basin stakeholders, this may be due to two factors: 1) many stakeholders do not realize the extent of pumping by independent, unregistered users; and 2) the pump operators are not organized as a recognizable group or groups of water users. Given the extent of pump operators and the increasing amount of extractions that they take from the Menik Ganga, it is interesting to note that many of their fellow Menik Ganga water users remain extremely misinformed about the extent of unregistered pumps extracting water from the river. Other water users (irrigators, down stream cultural and potable water users, etc.) recognize that some people are pumping water from the river. However, when asked to estimate the number of farmers pumping water out of the river and the average irrigated area of one farmer who is pumping, most offer gross underestimations. A typical estimation from other groups of water users numbers the pump operators between 50 and 200, and their land holdings at (less than) 1 to 2 acres per farmer. When asked whether they think that their water use is of significant concern, most reply “no.” A few upstream users with whom the research team spoke, however, did specifically cited the increased number of pump operators as a problem. These were also the small anicut irrigators who suggested that some pump irrigators come and open their anicut when water supplies are limited



Children of Gonagan Ara bathe in the muddy water of the Menik Ganga.

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<sup>25</sup> They explain that in the previous decade there had been more rain and it was, therefore, easier to cultivate other field crops.

further downstream. Because they are not a part of the DOI or Department of Agrarian Services projects, they are unregistered and not officially counted in water use planning and water extraction calculations.

The Gonagan Ara farmers' primary complaint about their river resources relates to water quality. Due to saline conditions of their groundwater, they rely on the river for potable water use. Community members contend that the river water is increasingly "full of soil", and attribute this to changing cultivation practices of Pelwatte Sugar Industries. They acknowledge that the Industries have installed a treatment facility, and add that while this has improved the water quality, the issue of turbidity remains problematic.

Two effects of water scarcity in the lower basin affect Gonagan Ara pump irrigators: insufficient water in Yala Park and insufficient water for Kataragama. Water scarcity in Yala Park has caused elephants to travel north in search of water. The farmers complain that when Yala Park and the surrounding buffer zone are dry, elephants travel north in search of water, and trample crops in the process.

In recent years, the Kataragama officials have been mandating that pump operators cease pumping water in August, and have taken pumps away that they found operating during the festive month. Though some farmers in the area have tried to irrigate during this hot month when crops drastically need rain, the severe repercussions have reduced the number of those who try. Another aspect of Kataragama water scarcity that causes tension in the community is the practice of selling Menik Ganga water to Kataragama visitors. People who take water from the river upstream to sell for private income to Kataragama festival goers and others perturb them. To the Gonagan Ara farmers, this is a much more contentious issue than dilemmas over upstream irrigation.

### Indications from the Case

There appears to be little conflict-related pressure on the Gonagan Ara pump irrigators at present, accompanied by severe **misinformation** among fellow community-level water users **about the extent of their operations**. In actuality, however, pump operators may affect not only water extractions, but also the stability of riverbanks and rates of erosion. Without attention to the pump operators' existence, their practices do not fall under any management scheme for basin resources. The profile of Gonagan Ara farmers, meanwhile, offers a glimpse at the extent and nature of the issue with pump irrigators on the Menik Ganga: an estimated 25 pumps operating on one side of the river over a 2-mile stretch, irrigating fields that are 3.5 to 5 ha in size. They indicate that individually-owned pumps have been a growing phenomenon in their community for the past 12 years.

Interestingly, while the pump operators themselves are not officially organized into a large group with assigned leadership, small groups of the pump irrigators have been able to mobilize and take action against upstream communities.

As mentioned in the Pelwatte case, the farmers' blaming PSI for increased turbidity in the water is another indication that **lack of information enables many stakeholders to blame large entities** like Pelwatte for water problems, and not to raise concerns over the approach to watershed resources management by all resource users. It is also interesting to note that while water quality tests have showed high levels of contamination, particularly of coliform and fecal coliform in the river by Gonagan Ara, farmers did not raise this as a concern. Instead, **the primary concern related to water quality is the visible, immediately palpable** issue of water turbidity. Such sentiments suggest that information on water quality issues remains low amongst community stakeholders

## Case 9: Department of Irrigation and the Proposed Veheragala Reservoir

### Veheragala

#### Background

The DOI is responsible for developing and maintaining major irrigation infrastructure in all areas of Sri Lanka outside of the Mahaweli District. They will thus maintain responsibility for the proposed Veheragala reservoir project, which would become the largest water diversion structure on the Menik Ganga. According to the DOI, the proposed size of the Veheragala reservoir is 65,000 acre-feet. The Veheragala project was first conceived over 20 years ago, and, according to the DOI, its construction may begin in January 2005.

If construction and financing go smoothly, the construction process is expected to take 4 to 5 years. Initial funds have been released for the first year's activities, but the government has yet to allocate most of the funds required. In a recent opening ceremony for the Veheragala reservoir construction project office, various parties within the Government of Sri Lanka, including the Prime Minister (representing the Presidential Fund) and two ministries promised funds for the Veheragala.

#### River Basin Resources Use and Conflict Scenario

Since 1992 when the Central Environmental Authority was established, new projects have to prepare an Environmental Impact Analysis. The proposed Veheragala project falls into this category, and in this case has been the responsibility of the Department of Wildlife, a branch of the overall Ministry of Environment and Natural Resources.

As indicated in the introduction to the Menik Ganga case studies, the Department of Irrigation has a vested interest to promote the Veheragala project in order to overcome some of the design problems associated with the Kirindi Oya system. The Department of Wildlife knows little or nothing about hydrology (only that they need water for animals in the Yala National Park in the dry season). Therefore much of the scientific information about hydrology and the benefits came from the Department of Irrigation with no other important scientific inputs into the information presented. The environmental impact assessment (EIA) concluded there would be no adverse hydrologic impacts because only "excess wet season water" would be diverted and dry season flows would be regulated from storage to ensure good supply for all. However, similar arguments were made to justify the Lunugamvehera reservoir and reality has turned out very differently.

A wide range of stakeholders in the Menik Ganga river basin, and beyond, have high expectations for the use of Veheragala reservoir waters. Their assumptions about future Veheragala water allocations vary greatly. In some cases, stakeholders' assumptions are the direct result of discussions with government officials or politicians. Such officials may suggest future gains to communities so as to obtain political leverage with those communities, although these proposed gains are not based on implementable plans. In most cases, individual groups of stakeholders are very optimistic about their groups' future benefit from the Veheragala reservoir.

Hopes that stakeholders expressed for the reservoir include:

- A Kataragama temple official explained that they look forward to the proposed Veheragala reservoir so that it will fill the six existing tanks below the reservoir, and provide a bathing place for Kataragama festival attendees and residents.
- Some Kataragama town residents noted that they expect the reservoir to solve ongoing water scarcity problems of Kataragama town.

- A DOW manager noted that the Veheragala reservoir’s EIA “promises” that when the reservoir is constructed, the DOI will release water for the Yala National Park.
- Kataragama farmers proposed that another tank be constructed, with a canal linking it to the Veheragala tank. This, they propose, could irrigate an additional 1,000 ha.
- Outside of the Menik Ganga river basin in the Kirindi Oya River Basin, another group of farmers expects to receive water from the Veheragala reservoir. These farmers have been neglected water from their own reservoir, the Lunugamvehera, due to water shortages. They expect to supplement Lunugamvehera reservoir waters with excess water from the Veheragala project via a canal that links the Veheragala and Lunugamvehera reservoirs. Farmers of the Lunugamvehera reservoir say that they are mobilizing 6,000 people to begin construction of the canal as part of their contribution to the infrastructure from which they expect future benefit. This, they say, will be one of the first construction efforts of the Veheragala project. They calculate that the Lunugamvehera reservoir will receive an additional 80,000 acre-feet from the Veheragala over the four rainiest months of the year.

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Site of the proposed Vehergala Reservoir.

All Menik Ganga River Basin Stakeholders interviewed, including the DOW, the Kataragama Temple Officials, Kataragama farmers, etc. said that they do not mind if water from the Veheragala system goes to Lunugamwahere if it is only the excess spill water. As one farmer explained, “If there is enough water we don’t mind... but **only** if there is enough!” They explain that the offtake for the Veheragala canal will be located high on the reservoir, so that it only releases water to the Lunugamvehera canal when the reservoir is filled to a certain level indicating that there is “excess” water.

However, with upstream and

downstream demands increasing, the frequency with which the Veheragala would reach this water level remains to be seen.

Meanwhile, the Department of Irrigation itself has not publicly announced official allocation plans for the reservoir. Although the Veheragala Environmental Impact Analysis proposed estimated allocations, future practice is not guaranteed to mirror these. At the recent celebration for the opening of the Veheragala Project Office, the DOI made no mention of the amount of water that key stakeholders such as Yala Park, Kataragama town water supply, or irrigators might receive. When questioned about proposed Veheragala allocations in an interview, DOI managers explained that the project’s emphasis is to protect the Yala National Park buffer zone and to overcome drinking water problems in Kataragama town. They anticipate that the largest number of beneficiaries will be citizens of Kataragama town. In addition, the DOI intends to expand irrigated land downstream of the reservoir by 500 acres. This irrigated agriculture expansion includes plans to increase the size of existing *anicuts*, and to cut a canal to feed small tanks for sugar cultivators.

The DOI explains that they intend to operate the Veheragala reservoir under standard DOI operating procedures. As such, the DOI would be responsible for the reservoir construction, and would manage water releases and additional infrastructure developments into the future. However, following the standard DOI protocol may do little to relieve the tension that could arise amongst stakeholders after the reservoir is completed. The department has a longstanding practice of withholding information about the allocation rules for major reservoirs, even when the reservoirs are fully operable. When asked about options for conflict-mitigating water management, DOI managers explained that they are not interested in the creation of a stakeholder forum or a new institutional entity for water management. They are familiar with such models, which were proposed and debated under ADB-funded efforts to develop a National Water Resources Authority. They explain that the District Secretary Council would continue to manage conflict over water resources during times of crisis or in response to significant stakeholder complaints.

### **Indications from the Case**

The Veheragala case provides a classic example of the problems of water planning and allocation in a water-short river where there is no systematic water management mechanism. The DOI is the planner, the implementing agency, and the operator of the system and therefore has a strong financial and political incentive for it to go ahead. The EIA, intended as the independent assessment, was largely dependent on the DOI for information. All stakeholders appear happy, yet it seems difficult to believe that if there really is enough water to satisfy everyone that other hydraulic development would have occurred years (or even centuries) ago.

The role of farmer organizations from Lunugamvehera shows that it is relatively easy to manipulate the political system to get popular support, even when there is little hard science available, and that government line agencies are happy for such routes to be chosen because then they can always blame politicians if the scheme fails.

## Case 10: Kataragama Anicut

### Kataragama

#### Background

In 2003, the DOI completed the construction of an *anicut* near Kataragama, which became the most downstream *anicut* on the Menik Ganga. Because of its location, this was a particularly controversial construction effort. The anicut is meant to deliver water to a series of 6 small tanks that are located nearby. The rainy (*maha*) season of 2003 was the first cropping season in which farmers received water from the new anicut system.

There are 226 farmer members of the system at present, with an additional 70 to 80 farmers expected following expansion. Most had previously practiced *chena* cultivation, which proved difficult at the tip of the dry zone. With the system in place, they have increased their command size, and received a sure allocation of water.

#### River Basin Resources Use and Conflict Scenario

The history of the Kataragama *anicut's* proposal and development is long, and strewn with controversy. Farmers and residents of the Kataragama area had been vying for it for decades. They claim that their fathers had been lobbying for it before them. Their proposals were ineffective, however, until the farmers engaged the Basnayakanilame of Kataragama (elected officer in charge of the Kataragama Religious Center) in their cause. The Basnayakanilame would benefit from anicut construction, because one of the 5 small tanks that it would feed belongs to the temple. According to Kataragama farmers, in order to accelerate the anicut proposal, the Basnayakanilame personally visited the Prime Minister of Sri Lanka, who directly ordered the Minister of Irrigation to construct this Kataragama *Anicut*. Prior to this, hundreds of Kataragama residents had signed a petition requesting this anicut, also blessed with the Basnayakanilame's signature.

After the DOI ordered the *anicut's* construction, however, it became even more controversial. When at last the Department of Irrigation prepared to lay the *anicut* foundation in 2001, the Wildlife Department and others strongly objected to its construction. Protesting entities included the Kataragama Delaway another religious center located downstream of the proposed *anicut*. These objections postponed construction for about a year, but did not stop it.

Now, farmers of the area are determined to expand the area under cultivation. Both they and the DOI acknowledge that additional irrigable land exists for this *anicut* system that has not yet been allocated. The farmers estimate that approximately 200 ha could be further developed. They explain that they want this land, but must go through government channels in order to acquire user rights. For its part, the DOI explains that it does intend to irrigate the additional land. "The question," a DOI official explained "is to whom to allocate the land."

Estimates of the number of hectares irrigated under the *anicut* system, interestingly, vary greatly.

According to farmers, they cultivated a total of 400 ha under the system in the rainy season of 2004. According to the Department of Irrigation, approximately 90ha were cultivated under this *anicut* in the same season. Farmers explain that they have only had sufficient water to irrigate during the rainy season. Some tried to irrigate in the one dry season that has passed since the *anicut's* construction, but failed to have sufficient water. Almost all of the area is cultivated in rice.

Farmers of the Kataragama Anicut system are relatively well organized under a system of nominated leaders who bear responsibility for sets of tanks. At the DOI's suggestion, they are considering re-organization into a "federation" of the entire *anicut* system farmers. On issues of group representation, they have learned from

their experiences when lobbying for the anicut's construction. They explain that for significant issues of concern, they contact the Divisional Secretary directly.

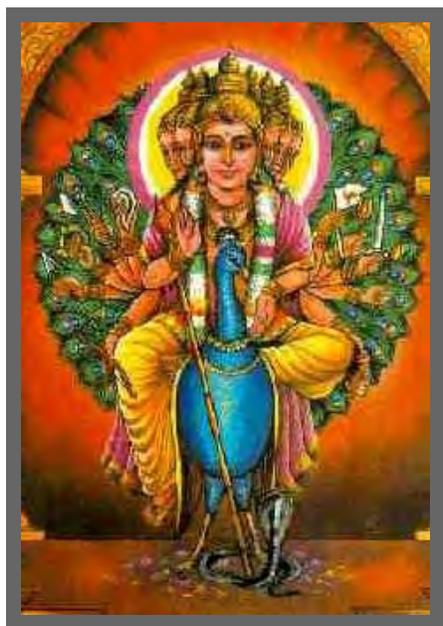
Regarding upstream water users, Kataragama farmers are primarily concerned with Pelwatte sugar, which they name as the largest consumer of the river's water resources. They are "not so concerned" with the pump irrigators, who they estimate to range between 50 and 100 in number. They are aware, meanwhile, that farmers from the Kirindi Oya would like to divert water from the Menik Ganga to the Kirindi Oya River. When Kirinid Oya farmers began to unofficially dig a canal between the two rivers, farmers from Kataragama went to the canal-digging site to protest. Now, Kataragama farmers say that if the proposed Veheregala reservoir is constructed *and* if water remains after all of the Menik Ganga stakeholders' needs have been met, they don't mind if the leftover water goes to Kirindi Oya farmers. "But only if there is enough!" they explained.

## Case I I: Kataragama Religious Festival

### Kataragama

#### Background

Kataragama is a sacred city for Sri Lanka's Buddhist and Hindu followers, in reverence to a god that believers of both religions worship in Sri Lanka. Each year, the religious Kataragama festival takes place between the months of July and August. The festival, in honor of the god known as Kataragama to the Buddhists and Skandakumar to the Hindus, attracts about 100,000 people per day over a 15-day period. Pilgrims from all the parts of the country visit the city of Kataragama not only during the festival, but also on weekends throughout the year.



July and August are low flow months for the Menik Ganga, when the river's water supply is most limited. Coincidentally, one of the most important ceremonies traditionally carried out in the Kataragama festival requires a substantial *quantity* of water, and another requires a suitable *quality* of water from the river. Chief among the festival's ceremonies is the water cutting ceremony, held in gratitude to God Kataragama.<sup>26</sup> The water cutting ceremony requires about 4 to 5 feet of water in the river. The river, unfortunately, has not carried this amount of water through Kataragama in July/August for the past decade. In order to perform the ceremony, Kataragama officials block the river and artificially create the required height of water. Another cultural practice at the festival is the offering of pure water to three gods believed to be present.<sup>27</sup> Due to increasing levels of water pollution, festival officials have deemed the river water no suitable for the practice. In order to address this, they dug a tube well specifically for the ceremony, from which they collect fresher water.

Religious pilgrims strongly believe that Manik Ganga water is holy water in which they should bathe prior to visiting God Kataragama for worship. Even on non-festival days, religious devotees bathe in the Manik Ganga at Kataragama to cleanse with the 'holy water.' Unfortunately, the Manik Ganga does not carry sufficient water during July-August for bathing, and throughout the year, its water quality at Kataragama is not suitable for bathing.

Culturally and politically powerful figures manage the Kataragama festival. In addition to the High Priest, an elected officer (locally titled Basnayaka Nilame) runs the Kataragama Religious Center. Every four years, this officer is elected by top level civil officers in the area, including all divisional secretaries and Government Agents. Consistently, the elected Basnayaka Nilame is a person of high standing in Sri Lanka's political and private sector arenas.

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<sup>26</sup> In the mythology of the Sri Lankan history, it is said that God, Kataragama, helped the Sri Lankan king, Dutugamunu, to cross the Menik Ganga during its peak water flow period. Dutugamunu crossed with the God's assistance in order to reach Anuradhapura, where he would fight with South Indian invaders.

<sup>27</sup> The three gods are Vishnu, Kataragama, and Shiva.

## River Basin Resources Use and Conflict Scenario

According to the Land Officer for the Kataragama temple, tensions over water access for the Kataragama ceremony occur most years. The temple has established a recognized right to water resources of the Menik Ganga during the festival season, and therefore requires, with the assistance of the government, that upstream agricultural users do not divert or pump water during the festival month. In dry years, Kataragama representatives visit many upstream communities, including the unofficial pump operators, Pelwatte Sugar Industries, and official and unofficial *anicut* operators to ensure that they do not use Menik Ganga water.

They act as regulators, and return to the same communities repeatedly if necessary. Officials explain that the frequency with which they return to the same group of irrigators depends upon the development stage of the farmers' crops. If crops are at a stage where water inputs are critical to crop growth, the officials return more frequently so as to ensure that farmers do not use the water. They deem this important, for under such circumstances farmers are more likely to begin using water again after the Kataragama officials leave. Officials seize the pumps belonging to operators who are found pumping water from the Menik Ganga in August, and hold them at the police station until Kataragama season is through. Last year (2003), they acquired 60 such pumps.

In order to carry out this massive undertaking, Kataragama officials travel with the accompaniment of police and/or the army. When crops are growing in an area, they travel with stronger enforcement - the army. They also call upon the Divisional Secretary, the area's top level official, to assist with more 'political' or difficult cases when necessary. Kataragama officials contend that the Pelwatte Sugar Industries' two *anicut* diversions are the "big problem," and that "influential" government officials visit the PSI.

In spite of all these efforts, the Kataragama Temple did not receive enough water from the Menik Ganga for last year's festival. Pilgrims had to dig wells in the riverbed for bathing. Drinking water for festival-goers is shipped in by bauser, but still insufficient.

Although Kataragama officials express concern over water scarcity, those interviewed were not interested in a significant change of basin-level water management approach. When asked about their opinions of a basin-wide forum to discuss issues of water management, Kataragama Temple representative responded that the concept of a basin-wide forum is a "wasteful" and "unnecessary" step in water management for the basin. It is more effective, they suggest, to continue with the practice of addressing upstream irrigators groups individually during times of need. "The high priest is very powerful" one concluded. "If water is scarce, he will demand the water."

## Indications from the Case

Although tensions that may lead to isolated conflicts between Kataragama officials and upstream water users arise each year during the festival month, the Kataragama officials ultimately succeed in halting much upstream water use at a time when water for agriculture is most needed. Two factors assist them in the effort: 1) Kataragama officials have a great deal of political and religious/cultural power. They can wield that power with the support of government-backed enforcement, complete with police, army and Divisional Secretary defenses; and 2) The festivities celebrated during Kataragama season are a part of the upstream water users' own cultural and religious practice. Lord Kataragama is considered a powerful god whom many would not wish to offend.

Kataragama officials suggest that the extensiveness of this power makes some officials disinterested in alternative, more participatory basin-level water management approaches. In spite of this, they acknowledge that Kataragama festivities continue to suffer from water shortages each year. At present, they have managed to acquire water for ceremonies, but are seriously short of water for bathing and potable consumption of pilgrims. If the Kataragama religious place does not receive enough water to perform its rituals, the issue will become very politically sensitive throughout the entire country of Sri Lanka.

## Case 12: Kataragama Water Supply

### Background

Kataragama town has a modern water supply system implemented by the National Water Supply and Drainage Board (NWSDB). It covers most of the permanent settlement but does not have the mandate to cater for all of the pilgrims who come to the town for the Kataragama festival during August of each year. The water supply scheme relies on pumping from the Menik Ganga into a treatment plant, and then stored in two overhead towers for pressurized pipe distribution to a few thousand domestic connections. The system runs more or less independently of other government agencies.

The system is run as a cost center by NWSDB, records are computerized, and income meets operating expenses but does not contribute to capital costs. NWSDB does not have to pay for the water it extracts from the Menik Ganga, of course, and the only constraint they have is when the flow in the river is less than their pumping capacity. The pump station is upstream of the town and therefore of the site for the Kataragama festival which also needs water for religious ceremonies.

The manager of the plant said that he did experience water shortages in the dry season, and that in many years it was necessary to supply drinking water by bowser, obtaining water from tanks and wells near the town. During the festival season when upstream users practice conservation, the water supply system is a direct beneficiary.

There were plans to expand the pipe distribution network but these depended on having a more reliable water supply. He felt water supplies had been decreasing over the past few years but there were no records available to verify this assessment. He had few concerns over quality because they chlorinate the supply before pumping into the overhead water towers. However, in the wet season there is sometimes high turbidity and they cannot always remove it before filling the water towers.

When asked about the proposed Veheragala system the Manager said he had heard about it, and that the Department of Irrigation had promised an increase in dry season water supply. Other than that he knew little of the scheme, although he is one of the more important potential beneficiaries should the project go ahead.

### Indications from the Case

Kataragama town water supply is an established user, and the only one that charges users for its services. It has a need and a willingness to expand, but is largely outside the debate that is occurring over the proposed Lunugamvehera Project.

Given that the domestic water supply is critical in the dry season it is surprising to note that the NWSDB does not take a more pro-active role in determining who upstream water users are, whether they have been increasing their consumption patterns over time (such as the Gonagan Aru pump farmers), and what the operating rules will be for the proposed structure.

## Case 13: Yala National Park and the Department of Wildlife

### Background

Yala National Park is an important asset to Sri Lanka's wildlife population and tourism industry. Approximately 1,259 sq km in total area, Yala is one of Sri Lanka's two largest National Parks. It is home to a large number of protected elephant, leopards, deer, and other animals. The Menik Ganga runs through the park for about 40 km, and spills into the Indian Ocean within its boundaries. The Menik Ganga serves as the main water source for the park's animal population, though two smaller streams provide some water to the northeast region of the park. The DOW maintains responsibility for Yala Park's management.

### River Basin Resources Use and Conflict Scenario

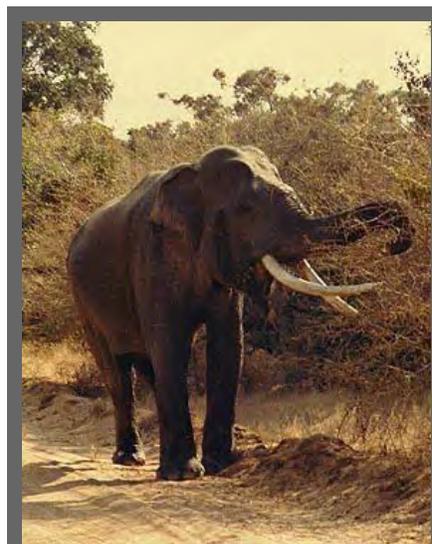
According to DOW, the stretches of the Menik Ganga that pass through Yala Park are completely dry throughout the months of July, August, and September. The DOW must literally deliver water to Yala's animals by trucking it into the park throughout those months, which is a cost and fuel intensive operation. According to the DOW, they have been shipping water into the park during the dry season for at least 8 years.

When asked about reasons for this water shortage at the tail end of the Menik Ganga, the DOW cites the presence of small tanks, small *anicuts* and the Pelwatte Sugar Industries. The DOW has objected to upstream water diversion proposals, including the proposal to construct an *anicut* structure in Sella Kataragama. Although the DOW's objection stalled the development of the *anicut* for about a year, it was ultimately constructed. The success of this infrastructure development so far downstream was largely due to the Basnayaka Nilame of Kataragama (elected officer in charge of the Kataragama Religious Center).

The DOW explains that most of their communication with upstream water users currently takes place through meetings with Divisional Secretary (DS) of Kataragama, that are held in times of crisis. These are convened when called by the DS at the request of the Basnayaka Nilame, and include community leaders, religious leaders and civil servants who live and work within the district's political boundaries. Thus, the DS meetings do not incorporate all stakeholders of the river basin.

In one step toward water and resource conservation, the DOW is currently taking action to expel illegal cultivation within Yala Park. It is estimated that 200-300 people are currently involved in *chena* agricultural production inside the boundaries of Yala Park. These communities do not live within the park, but use water from its small tank system to cultivate on encroached land.

Looking to the future, the DOW has strong hopes for receiving additional water that will be captured by the proposed Veheragala reservoir. The DOW has been a strong advocate for the reservoir, and has approving authority over its Environmental Impact Assessment (EIA). The Department notes that the Veheragala reservoir's EIA "promises" that when the reservoir is constructed, the Department of Irrigation will release water for the Yala National Park. The DOW proposed that only spill water from the reservoir should be allowed to flow to the Lunugamvehera reservoir of the Kirindi Oya basin.



Elephant searching for food near Yala Park.

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### Indications from the Case

The Department of Wildlife has high hopes for the Veheragala project as they hope it will allow more water to be made available for wildlife in the dry season. Yet they have nothing other than verbal assurances about improvements in water supply. They have been led to believe water supplies will be increased, and that seems sufficient to remove any concerns.

The DOW is perhaps the most vulnerable of the water users because without dry season water supplies wildlife will either die or migrate to other locations away from the main tourist centers. Given the high value given to elephant protection in Sri Lanka by almost all stakeholders, the DOW does not seem to take advantage of this in ensuring a more cast iron guarantee over future water supplies as part of the Veheragala planning process.

Relationships between the DOW and the DOI are not strong. The DOI tends to regard the DOW as a nuisance who do not know enough about hydrology to bother with, and consequently do not take them particularly seriously. Irrigated agriculture remains the primary focus of DOI and they have not changed their attitudes much over the past 20 years.

## **SET 3: PILOT APPROACH TO ALTERNATIVE MANAGEMENT OF RESOURCES**

### **Ridi Bendi Ela Farmers Company: Private Management of Irrigation Resources**

#### **Background**

Irrigation systems in Sri Lanka are divided into two main types: large and medium systems where government normally plays an active role in management of the reservoir or headworks and in the operation of the main canal system, and minor systems that are largely operated by water users with little direct government involvement.

From about 1980 onwards there have been a series of moves to try to increase involvement of water users in water management. Initial efforts focused on establishment of organizations at tertiary canal level, the smallest canals in large systems with approximately 10-25 farmers. However, experience showed that these organizations were generally too small to play a significant role in representing farmers in planning and management at higher levels in the system, and the focus switched to establishment of farmer-based organizations at distributary canal level. A typical distributary canal has 5-15 field channels and would therefore represent some 50 to 200 farmers. These distributary canal organizations (DCOs) were federated from constituent field channel groups, and took increased responsibility for operation of maintenance for secondary canal operations and maintenance, and worked together with the Irrigation Management Department for purposes of seasonal planning and prioritization of larger maintenance and rehabilitation activities. DCOs received financial contributions from government to maintain the distributary canal, a task that had traditionally been responsibility of government agencies. In theory all DCOs in an irrigation system are federated into a System Level Farmers Organization (SLFO) which has a limited role in seasonal planning. Representatives of the SLFO are joined by government officials from Irrigation Department, Agrarian Services and others to form the Project Management Committee. The PMC is intended to help plan seasonal activities, deal with disputes and generally oversee the system operation, maintenance and management.

Ridi Bendi Ela was selected for a special initiative to turn over the operation and maintenance of the entire system to farmers. This was accomplished through an agreement to provide direct financial support to the SLFO rather than split among the constituent DCOs. To give the SLFO support, farmers were, for the first time in Sri Lanka, given the opportunity to establish a company that would take over management responsibility on behalf of the SLFO. It is a pioneering effort to transfer management responsibility to the private sector, invest farmers as shareholders with the opportunity to make profits, and hire private individuals to undertake irrigation management.

## Case 14: Ridi Bendi Ela Farmers Company

The Ridi Bendi Ela Farmers Company (RBEFC) is registered as a private company with the government, and offers shares at Rs. 10/- face value to farmers at Ridi Bendi Ela. It was formally established in 2000. Not all farmers are members. At present about 70 percent of farmers are shareholders, giving them the normal rights to attend the Annual General Meeting, and together they have a capitalized value of approximately Rs. 1.2 million. Shareholders are free to sell their share holdings to other farmers at face value but may not sell them to outsiders.

During the past four years the company has made two dividends to shareholders, each being the issuance of one new share for every 5 shares already owned. This represents a return of 10% per annum, which is a modest return for rupee investments in Sri Lanka compared to interest rates from commercial banks.

### Company Functions

The company has two separate functions, a agro-business orientation that aims to develop new commercial opportunities for members, and a management contract with the Irrigation Management Division (IMD) to operate and maintain the 2000 ha Ridi Bendi Ela system on behalf of the approximately 3000 farmers. All farmers in the system therefore are the beneficiaries of the management wing of the company, but only the 2200 shareholders benefit from the agro-business ventures.

The agri-business side seeks to develop a range of different income generation activities for those members interested in participating. Some have been directly linked to agricultural production from irrigated land, some from highland and garden activities. Ventures have included chicken rearing, seed multiplication, herbs, organic fertilizer production, gherkin production, and more recently production of 2 kg and 5 kg packages of Ridi Bendi Ela “aroma rice” which is marketed to supermarkets and wholesalers. Aroma rice is a high quality aromatic rice that is higher priced than normal rice in the market. Company members are eligible to receive loans from the company for input and agric-business activities. In addition the company provides discounts on agricultural inputs such as seeds, fertilizer, weedicides, and pesticides, and sells to the general public at prevailing prices through a retail outlet (Ridi Bendi Ela Green Corner) next to the company offices.

### Ridi Bendi Ela Retail Shop Selling Agricultural Inputs to the General Public

The irrigation management function is effectively a franchise from the Irrigation Department through the Irrigation Management Division. It undertakes all the roles that IMD staff would normally undertake in main and secondary canals, including water scheduling and distribution, water measurement, maintenance and minor repairs to canals and structures. Nominally it has to conform to certain Irrigation Department guidelines for these O&M activities, although these guidelines are somewhat unspecific. All irrigation infrastructure is owned by the Irrigation Department, and the RBEFC is expected to keep the system in good operating condition.

It is important to keep these two functions separate when looking at the progress made by the company since its creation. There is nothing to prevent the RBEFC from continuing its agro-business interests whether or not it



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continues to manage the irrigation system. The company is no different from any other private company. Obviously, if management of the irrigation system is viewed as effective and can provide services that support improved incomes for constituent members, all well and good, but in practice the two functions are separate.

### **Company Financing**

To help the company establish itself initially, the Irrigation Management Division provided an interest-free loan of Rs. 10 million so that the company could use the interest during the establishment period. This means that the company currently has three sources of income: interest from the loan, the annual management fee paid by the Irrigation Management Division, and any profit accruing from agro-business enterprises.

The first two sources of income are not assured because government has yet to fully endorse the concept of private sector management of irrigation systems. The DOI agreed, with some reluctance, to offer the RBEFC a three-year contract through the IMD whereby they would guarantee to supply water from Dedura Oya to Ridi Bendi Ela tank. The DOI still operates the diversion structure on Dedura Oya that supplies a feeder canal to the reservoir. When the management contract expired in 2004 it was extended for one more year and the process of getting this renewed seems fated to become an annual negotiation that places an additional stress on the RBEFC.

Similarly, the Rs. 10 million loan could be called in at any time, and this would significantly reduce company income. It seems that current income from the agro-business side has not grown to the point where it could replace the current subsidy arrangement. There has not been any significant growth in share ownership since the company was originally formed, although there is nothing to prevent farmers from investing more should they wish to do so.

The company has made loans to some 800 members, valued at some Rs. 4 million, roughly half of which are now in default. The loans exceed the share capital of the company. As long as the Rs. 10 million loan is available the company can deal with this adverse situation.

### **Company Structure**

The company has two full-time senior professional staff: a General Manager and a Water Management specialist. Since its inception there have been two General Managers, while the Water Management Specialist who has been there since 2000 is about to take up other employment.

The General Manager is responsible for agri-business development and management, supply of inputs and credit to company members, and for general liaison with government officials. The current incumbent used to work for the Department of Agriculture, took early retirement, and then worked in the private sector seed business for several years before coming to Ridi Bendi Ela. It is through his initiative that the company started to promote cultivation, processing and marketing of aroma rice.

The Water Management Specialist is a graduate engineer who had worked for a private company before coming to Ridi Bendi Ela. Although he had not worked for the DOI or the IMD, he was able to learn the overall operation and maintenance of the system with support from that division.

In addition the company hires several office staff including bookkeepers and secretarial staff, plus a shopkeeper. All records of the company are computerized, including share holdings, accounts and loans to individual members.

### **1. Conditions prior to the establishment of the farmer company**

Ridi Bendi Ela was a typical irrigation system before the establishment of the SLFO and the Farmer Company. The DOI, through the IMD, was responsible for operating and maintaining the main and secondary canals with the services of (staff). Performance of the system was only average. In the wet season, all farmers could expect to receive water unless rains were much lower than normal, but in the dry season many farmers had to forgo cultivation. This was partly due to shortages at system level, but also because there

was no effective water distribution plan. Upper end farmers had preferential access to water resources and were able to access much more water than required for cultivation, leaving tail end farmers to suffer while there was significant water flowing out of the system through drains. Typical annual cropping intensity was about 1.3 to 1.4 with almost all of the double-cropped area along head end canals.

This head-tail split had negative impacts on maintenance by tail end farmers, leading to the typical cycle of poor water management and deteriorating infrastructure. The government officers running the system were not accountable for overall system performance, and there were no fee payments linked to operational performance.

The seasonal planning meetings that bring together farmers and government officials twice a year were, at least for the dry season, unsatisfactory and divisive affairs. The meeting is supposed to decide on such matters as date for first water issues, date for starting land preparation, date for sowing, varieties to be sown, last water issue date and the calendar for rotational irrigation in times of water shortages. But with frequent shortfalls in water for the dry season government officers tried to promise that more water would be available, but rarely lived up to these promises. With weak management of the system that resulted in unequal water deliveries, unpredictable and fluctuating water supplies, and little coordination between different DCOs, overall system performance was unsatisfactory. In this respect, Ridi Bendi Ela was little different from other systems.

## **2. Company efforts to improve water management**

The creation of a system-wide management organization with at least partial ownership by farmers led to strong initial efforts to get as many farmers into the company as possible. While recruitment of farmer members only reached about 70 percent of the total population this was a significant achievement given that only about one third of farmers were getting reliable dry season irrigation. In the past couple of years the dry season cropped area has increased to somewhere between 50 to 70 percent of the system, largely attributed to improved distribution and control over water when there are potential shortages. In some dry seasons there has been complete cultivation of the area, but this can only happen when there is above average water available in Dedura Oya.

Initially it was hoped that a program of crop diversification would help reduce demand for water, allowing more farmers to cultivate during the dry season. However, many farmers can grow non-rice crops on home garden areas, particularly those who have invested in agro-wells, and the market remains uncertain for widespread cultivation of non-rice crops. Initial agri-business ventures such as chicken farming and small enterprises for gherkins and herbs did not make any significant impact of water management.

Subsequently, management has focused on trying to ensure as many farmers as possible get access to dry season water. Through a set of agreements between the different DCOs water distribution patterns have become more predictable and reliable, water levels in canals have been maintained at more steady levels, and overall satisfaction with water deliveries appears to have increased. This has involved a great deal of dialog between different groups within the system, more openness in information sharing about water management conditions at system and local level, and an effort to really improve service to as many people as possible. The divisive split between head-end and tail-end farmers has been greatly reduced because more tail enders get more water than before, and better understand the management problems faced at system level.

## **3. Potential threats to the Farmer Company**

To date the RBEFC has been a successful pilot program. It has survived its first four years, membership remains strong, internal disputes within the irrigation system between head-end and tail-end farmers have been greatly reduced, and overall agricultural and water productivity appear to have improved. But the situation is by no means stable, and it is worthwhile looking at some of the potential threats facing the system before examining opportunities for further consolidation.

The most immediate threat appears to be uncertainty over water deliveries to the reservoir by the DOI. The initial three-year franchise has been extended by one more year but this is a weak basis for operation. It is unclear if the DOI could or would try to take over system operations again, but the implicit threat is there. Four years is a comparatively short time for a business to establish itself and generate sufficient knowledge and financial strength so that it can operate independently, and it is important for the franchise to have another long term extension to give the company a fair chance.

The initial franchise legitimized the right of the company to manage an irrigation system but it gave nobody any more assured access to water. Farmers in irrigation systems, including Ridi Bendi Ela have no long term right to water. If there is sufficient water in the reservoir at the time of the seasonal meeting then they get a promise of water deliveries for that season only, and even less assurance about timing and reliability of water supplies. As a franchisee the company needs greater assurances that it will receive enough water for it to make effective management plans, and cannot function effectively if its access to resources is also uncertain.

The DOI has never favored the establishment of private sector irrigation management, for obvious reasons of loss of influence and prestige. It is not surprising that they would be happy to see the venture fall on hard times. The IMD has, through the efforts of committed individuals, been able to provide support for the pilot activity but it is clear they do not have the strength or energy to expand the program to other locations. As is so frequently the case, inevitable staff changes may result in reversal of the current support that the Company currently manages to cling to.

A related issue is the status of the Rs. 10 million loan from IMD to the RBEFC. This loan, the capital of which is untouched, provides a good income to the organization that helps augment the standard payment from IMD to DCOs for taking over operation and maintenance work at distributary canal level. If this loan were withdrawn then the RBEFC may face significant financial problems that it cannot expect to immediately overcome.

The Farmer Company receives no direct payment from members for water management services so that there is no direct incentive to maintain a good level of service. Farmers do not pay the Irrigation Department for services, the agreement being that farmers are responsible for field canal operation and maintenance, while the Department pays farmers for doing the secondary canal maintenance that is officially a departmental responsibility. At Ridi Bendi Ela the Farmer Company has assumed management of the entire system and is providing an improved service to all members of the community, not just those who are company members. Other than the interest from the Rs. 10 million loan, they get no financial reward over and above the standard IMD contribution for secondary canal operation and maintenance. Because not all irrigators have to be members of the company there are in effect a lot of free riders who benefit from improved water delivery services but have no direct stake in the company itself.

This split in function between providing water management services and running a commercial agri-business venture does represent a threat to the viability of the company. Free riders can continue to benefit without having to buy shares in the company, and it is possible that if the financial health of the company deteriorated due to bad debts and lack of profitability, the water management function would be withdrawn.

The current business venture of aroma rice does link together membership in the company and improved water management, which is a strength, but in general the other agri-business enterprises have had little link with providing improved water services. Rice is a reliable cash crop although prices are subject to manipulation, but for other activities to be successful the company needs to identify buyers of specific products and arrange forward contracts. Picking the activity or new crop and then trying to sell it is not a stable way to do business.

Finally, the company needs to ensure that changes in the technical staff do not damage the purpose and viability of the company. The change in General Manager appears to have passed without major disruption and has resulted in new business ventures in relation to packaged rice that appear profitable. The forthcoming change in Water Management Specialist represents a more complex challenge for the company as the new

person has to learn how to operate the system in such a way that the current levels of service are maintained, and also manage the continuing relationship with IMD and the DOI.

#### **4. Conclusions**

The irrigation management component of the RBEFC has been comparatively successful in two important dimensions. It has shown that private sector enterprises have the technical and managerial capacity to operate and maintain irrigation systems at least as well as the DOI, and it has greatly decreased long-standing conflicts between different parts of the irrigation community through extensive dialog with water users. It serves as an excellent model for the future, but it is not clear that the Ridi Bendi Ela model is immediately replicable.

The main cause for concern is in the institutional relationships between government and private sector over water resources management. In an environment where there are no water rights the private sector franchisee can be put in the invidious situation where they are required to provide a service to members but have no guarantee of accessing the resources they need to undertake this function.

Merely trying to replicate the Ridi Bendi Ela model will not work unless there is some wider acceptance by the DOI that private sector groups can manage irrigation systems. The fact that Ridi Bendi Ela has managed water better makes the concept of franchising water management no more attractive to the DOI.

Unlike a normal business model, the franchisee at Ridi Bendi Ela does not have to pay the DOI for its water supply. It is likely that this is the long term prospect, whereby a company purchases water for subsequent distribution, and charges a management fee for doing this. But this will require a change in public perception (and effectively the reality) that water is provided free of charge. A more detailed analysis of the success of Ridi Bendi Ela needs to look at whether the farmers themselves feel the improved water services they have received merit payment in the same way as people are willing to pay the National Water and Drainage Board for reliable and improved quality of domestic water supply. If the outcome suggests that farmers would pay for improved service, then there is an opportunity to offer something to the DOI in terms of a wholesale management fee.

Such a detailed assessment is timely and necessary. The alternative scenario is that the relatively successful Ridi Bendi Ela will be seen as a one-off adventure, and that business will return to normal, with poorer service, more disputes, and loss of the benefits that have resulted from the private sector involvement in water management.



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