

***Rewarding community efforts to protect
watersheds: Case study of Fondes Amandes, St.
Ann's, Trinidad and Tobago***

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Who Pays for Water?

Preparing for the use of market-based mechanisms to improve the
contribution of watershed services to livelihoods in the Caribbean



Project Document No. 12



This report is a product of an action learning research project to examine and test the use of markets and incentives to improve the quality and delivery of watershed services, such as water production, soil erosion, landslide and flood control, and biodiversity protection, for the purpose of improving local livelihoods, especially for the poor. The project, called *Who Pays for Water? Preparing for the use of market-based mechanisms to improve the contribution of watershed services to livelihoods in the Caribbean*, is implemented by the Caribbean Natural Resources Institute.

The project focuses on four countries, Grenada, Jamaica, St. Lucia, St. Vincent & the Grenadines, and Trinidad and Tobago. Project activities include action learning projects in St. Lucia and Jamaica to value watershed services and to test the usefulness of markets and incentives to address critical watershed management issues; establishment of an Action-Learning Group to validate and critique project findings and results; research on the potential effects of water sector privatisation and of the incentive opportunities from the tourism sector for watershed protection services; and, training activities in land use and hydrology tools, valuation for environmental services.

Project research is carried out in collaboration with the Sustainable Economic Development Unit of the University of the West Indies and the Forestry Departments in Jamaica, St. Lucia, Grenada and Trinidad and Tobago.

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LIST OF ACRONYMS

CANARI	Caribbean Natural Resources Institute
CTON	Clean Trees Organic Nursery
DFID	United Kingdom Department for International Development
ESA	Environmentally Sensitive Area
FACRP	The Fondes Amandes Community Reforestation Project
FFPP	Forest Fire Protection Programme
Forestry	Forestry Division (Republic of Trinidad and Tobago)
IIED	International Institute for Environment and Development
LAD	Land Administration Division
LSD	Lands and Surveys Division
Min.ComDev	Ministry of Community Development
MPUE	Ministry of Public Utilities and the Environment
NGO	Non Governmental Organization
NRWRP	National Reforestation and Watershed Rehabilitation Programme
PCFIU Forestry	Private and Community Forestry and Incentive Unit (of the Division)
TCP	Town and Country Planning Division
TRF	Tropical Re-leaf Foundation
UN	United Nations
WASA	Water and Sewage Authority
WHO	World Health Organization
WRA	Water Resources Agency

**Rewarding community efforts to protect watersheds:
Case study of Fondes Amandes, St. Ann's, Trinidad and Tobago**

EXECUTIVE SUMMARY

This case study tells the story of a long-standing community self-help effort in watershed management from the island of Trinidad. The Fondes Amandes Community Reforestation Project (FACRP), which had its genesis in the early 1980s in the informal activities of a small group of illegally settled farmers, is today a nationally recognised and highly regarded initiative.

Threats to Trinidad's watersheds from activities ranging from urban expansion to poor agricultural practices have generated considerable concern in environmental circles and appear to be increasing. Government policy has increasingly emphasised stakeholder approaches and partnerships with private landowners. However, many watershed settlers lack legal tenure, and formal mechanisms for working with these communities are limited.

Through persistent effort and with the help of a handful of supporters, informal settlers of the Fondes Amandes hillside community have secured permission, albeit only verbal, to protect a critical portion of watershed above Port of Spain, Trinidad's capital, through agro-forestry and fire protection activities that provide income and employment opportunities to the community. In exchange, they have gained reasonably secure use of the land for living and farming.

The study examines the role and potential of economic instruments in helping to sustain the arrangement, and in so doing identifies a number of non-economic factors that have motivated past activity and could contribute to future success. It concludes that while financial and semi-financial incentives and rewards have been important factors in the project's longevity, they have not been the only factors, and much of the motivation for the project continues to be generated within the community itself.

The Fondes Amandes case demonstrates that under certain conditions informal and *ad hoc* arrangements between community-level watershed managers and their beneficiaries can contribute to improved watershed services, even when external incentives are limited

and compensation is sporadic and inequitable. Lessons coming out of the experience include these:

- Diverse factors motivate watershed service “providers”, and even people without land tenure can be willing to invest in sustainable land management practices.
- Direct benefits are not the only motivation for watershed service “buyers”, who may support watershed protection out of an interest in broader benefits such as forest conservation or poverty reduction.
- Government plays an indispensable role in all watershed protection efforts by providing the enabling policy and institutional environment.
- The value of watershed services depends on different stakeholders’ perception of costs and benefits, and compensation is therefore negotiable.
- There is no single template for effective community institutions: even those without a formal democratic structure can coordinate watershed management initiatives as long as they have adequate leadership and appropriate skills and resources.

INTRODUCTION

Watersheds in Trinidad's Northern Range are rapidly being degraded, largely as a result of urban development, unsustainable agricultural practices and quarrying (Pantin and Krishnarayan 2003). Traditional forest management approaches employed by the State have not been able to keep pace with these threats. Alternative approaches involving local communities have had some success. These include government-led initiatives such as the National Reforestation and Watershed Rehabilitation Programme and the multi-stakeholder management committees of the newly-declared Environmentally Sensitive Areas, as well as community-led initiatives such as the reforestation project that is the subject of this case study. All are designed in some measure to provide an alternative strategy for watershed protection and management while providing ways in which community members can improve their livelihoods.

Recently, many donors and conservation agencies have begun to promote market-based approaches to managing watersheds. These approaches are based on the premise that environmental degradation stems from insufficient financial resources through a failure of markets to capture the services that watersheds provide, such as water quality, flow regulation, erosion and flood control, nutrient recycling, and biodiversity protection. Giving an economic value to such services could in theory make it possible to establish markets between those who benefit from them (the "buyers", for example water companies or downstream landowners) and those who contribute to maintaining them (the "sellers" or service providers, such as watershed residents and forest management agencies). These market incentives and rewards, and any associated contractual arrangements between buyers and sellers, would in turn encourage protection of watersheds by giving an economic value to the services they provide (Landell-Mills and Porras 2002; Pagiola and Platais 2002).

This case study is about a watershed restoration and protection initiative of a group of informal settlers in the community of Fondes Amandes in the Caribbean island of Trinidad that has been underway since 1982. Over the years, the group's efforts have been rewarded in various ways by government, international agencies, and private sector and non-governmental organisations (NGOs). While Fondes Amandes is frequently

alluded to in Trinidad as a model of successful community-based watershed management, there has been little quantification of the services provided, of the value and distribution of the project's benefits, or of the mix of motivations, incentives, and rewards that have contributed to its sustainability.

This case study seeks to disentangle the various factors contributing to the initiative's longevity; to identify the services being provided, the beneficiaries of those services, and the value the services have to those beneficiaries; and to explore the potential of market-based instruments or other forms of economic incentives to sustain or enhance the arrangement. It then examines the Fondes Amades experience in the light of environmental market theory, in order to draw lessons that may be of value to policy makers and others interested in approaches for increasing community responsibility for watershed protection. It concludes with a brief consideration of whether the project offers further scope for environmental service payment mechanisms.

This case study is a product of research conducted under the three-year project *Who Pays for Water? Preparing for the use of market-based mechanisms to improve the contribution of watershed services to livelihoods in the Caribbean* (<http://www.canari.org/alg.htm>) implemented by the Caribbean Natural Resources Institute (CANARI) in collaboration with the International Institute for Environment and Development (IIED) and funded by the United Kingdom Department for International Development (DFID).

WATERSHED MANAGEMENT ISSUES IN TRINIDAD: AN OVERVIEW

Watershed degradation and its impact on water supplies

The Northern Range, which extends from east to west across the north of the island, is the highest and most extensive of Trinidad's three mountain ranges and its most important water catchment area. As a result of changing land use patterns, it has become severely degraded. Among the commonly cited threats to Trinidad's watersheds are (Pantin and Krishnarayan 2003):

- expansion of housing development into forest areas, including both high-income residences and squatter settlements;
- mining for construction materials;
- dry season fires;
- poor sanitation facilities and improper sewage disposal practices in upland areas;
- poor soil and water conservation measures on hillside agricultural lands.

There has been concern among environmental management agencies, conservationists, and the general public that this degradation and loss of forest cover is having or soon will have an impact on water supplies and quality, particularly as the island's population increases as it is projected to do. The Water Resources Agency (WRA) in its 2001 national report contends "that the hydrological response of rivers to rainfall has changed over the years due to [land] degradation" (WRA 2001: 7). This trend has had three main impacts. The first is that while there is sufficient water from surface, ground and reservoir sources to satisfy current demand, due to variations in the spatial and temporal availability of water during dry or rainy seasons, localised imbalances often occur, resulting in water shortages being experienced by some of the population¹. The ability to

¹ In 2002 WASA estimated that 92% of the population had access to water but only 50% of those served had access to water on a 24 hour basis (RIC 2005)

supply all the competing demands² for water is further affected by extreme events, such as severe dry seasons and increased siltation from heavy rains which may require rationing or shut downs at reservoirs, and bottlenecks and leakages in the water supply infrastructure. Leakages in the water supply system are estimated to be as high as 50% (Mycoo 1999).

Secondly, while groundwater quality in Trinidad generally falls within the limits set for potable water by the World Health Organisation, the cost of drinking water production is rising and water treatment plants require more regular maintenance as a result of factors related to poor land use practices in watersheds, including:

- higher sediment yields from eroded surfaces;
- contamination by pesticides and agro-chemicals;
- infiltration of large amounts of untreated or inadequately treated domestic waste, particularly sewage. The WRA report estimated that 60 % of households were connected to the main sewerage system, and that the sewage from only 70 % of those connected is treated. In the absence of thick overlying clay layers, most aquifers are very vulnerable to the infiltration of contaminants (WRA 2001: 11).

Thirdly, increased run-off has reduced flows to groundwater aquifers, and has been contributing to increased flooding, especially in lower lying areas. Flooding in both urban and rural areas, particularly during the rainy season, leads to substantial losses of property, crop damage, health problems and severe inconvenience to entire communities.

Watershed management institutions and approaches

The main government agencies involved in watershed management are the Forestry Division (Forestry) and the Water and Sewerage Authority (WASA), both of which fall under the Ministry of Public Utilities and the Environment. Forestry manages all forested state lands and has enforcement responsibilities that also extend to private forests. WASA

² WASA accords industrial users a high priority in terms of supply but the installation of a desalination plant to meet the needs of the Point Lisas Industrial Estate reflects an attempt to ensure that this is not to the detriment of domestic users.

manages the state-owned and operated public water supply system and is the primary abstractor of water in the watershed. WASA also maintains and oversees the reservoirs in lower watersheds. The WRA, which is part of WASA, is responsible for regulating the abstraction of surface and ground water.

Additionally, the Town and Country Planning Division, Lands and Survey Division and Land Administration Division have responsibility for land development, execution of leases and state agricultural land management respectively. This makes for a complex institutional and legislative framework in relation to approvals for land use change and development. Moreover, much development takes place without official approval.

The emphasis of Trinidad's current Forest Policy³ is on sustainable management of forest resources and recognition of the contribution that forests have made and could make in livelihoods. In keeping with this policy orientation, Forestry's management approach has expanded to include initiatives that involve other government agencies and local communities, as well as its traditional work with land owners and farmers.

Simple financial incentives have long been a part of Trinidad's approach to watershed management. These have included subsidies for planting seedlings, with technical assistance for establishment of forest cover and construction of storm and contour drains and terracing, and tax rebates for cutting perimeter fire lines and nature trails and on equipment purchased for re-forestation. Particularly since the 1990s many incentive schemes for re-planting and fire trace cutting have particularly targeted farmers illegally occupying state agricultural land⁴. This approach reflects a perception within government that in the absence of incentives people without land tenure would have neither the interest nor the means to invest in soil conservation and rehabilitation on the land where they farm or have houses. The basis for this perception is unclear, as the impacts of

³ Since the first official Forest Policy in 1942 when Trinidad and Tobago was a British Colony, there have been two draft policies prepared, in 1981 and 1998. A review of Forest Policy is due to take place during 2007.

⁴ Squatting and other illegal use of state forest lands has long been a hot topic in Trinidad environmental debates. While these practices are widespread, it must also be noted that many illegal users "were previously [officially] encouraged to establish small holdings in the Northern Range through patronage or as part of a concerted development thrust" (Pantin and Krishnarayan 2003: 47).

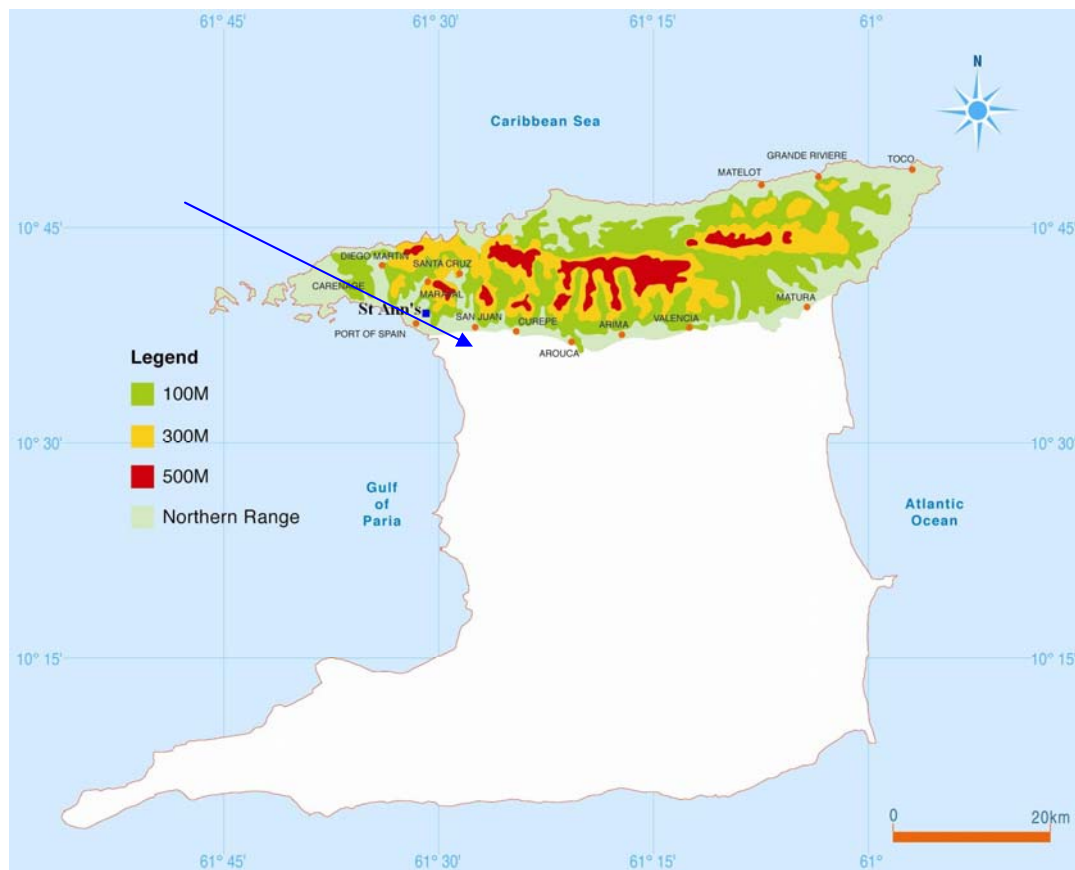
illegal settlement and farming are not monitored on a systematic basis (Pantin and Krishnarayan 2003: 46). These initiatives have been complemented by the passage of the State Land (Regularisation of Tenure) Act 25 of 1998 and programmes of regularising tenure through approval of short-term leases.

In 2003, Forestry created a Private and Community Forestry and Incentive Unit that provides training for and promotes the involvement of community-based organisations in forest management and the generation of direct and indirect livelihood opportunities. Community involvement in the rehabilitation of watersheds has also been promoted by the NGO sector and particularly by the Tropical Re-leaf Foundation (TRF), which played a critical intermediary role in the development of the Fondes Amandes initiative described below and has subsequently piloted several other community reforestation initiatives in the Northern Range.

FONDES AMANDES WATERSHED PROTECTION INITIATIVE

The Fondes Amandes community

Fondes Amandes, a hillside community developed around a former cocoa estate now partially owned by WASA, is located in St. Ann's, a mainly middle class residential suburb of Port of Spain, in the foothills of the western Northern Range and adjacent to an important reservoir serving metropolitan Port of Spain (See Map 1).



Map 1 Map of the Northern Range showing the location of St Ann's Watershed
(Source www.mapscd.com/trindadytobago_illustrator.html, with St Ann's added by the Forestry Division)

After the cocoa estate lands were abandoned by their owners, some former estate workers remained and were granted land, while other parts of the land were allowed to return to forest to protect the reservoir. In the 1970s and 1980s informal settlers, some forced out from a neighbouring community by the legal landowners, began to move into these lands to live or farm. Today, the community comprises approximately 37 families of informal

settlers, making a total of over 160 residents including children. The majority of adults in Fondes Amandes work outside the community, although many have multiple livelihood activities which include some subsistence farming.

Brief history of the Fondes Amandes Community Reforestation Project

The origins of the Fondes Amandes reforestation and watershed protection initiative date back to the late 1970s, when the late Tacuma Jaramogi, later joined by his wife Akilah Jaramogi, began farming traditional vegetable short crops on the WASA-owned hillside of Fondes Amandes. Like many of the farmers and settlers coming to the area at that time, they were Rastafarian, and in the early years the Rastafarian lifestyle provided a strong community bond. However, it also fostered suspicion among the downstream ‘elites’ (as they are referred to by the settlers), who routinely blamed the group for all negative impacts on the watershed, accusing them, for example, of setting fires and dumping rubbish in the river, activities that were in fact being carried out by others.



Akila Jaramogi, Project Manager
(Source <http://www.triniview.com/articles/fondes.html>)

Drawing on Tacuma’s experience working with Forestry, the Jaramogis planted fruit-bearing tree crops interspersed with hardwood trees in an effort to control the dry season bush fires that were often caused by the escape of other settlers’ trash or agricultural fires, and the excessive soil erosion and flooding during the rainy season, which resulted in heavy siltation of the river and water works.

These early agroforestry initiatives failed to halt the annual fire damage, particularly a devastating fire in 1987. In 1990, another threat emerged when WASA, in an effort to secure its holdings in order to protect the water supply, served notice on the Jaramogis and other residents to quit their lands. Tacuma sought help from the Parliamentary Representative, who was also a professional forester with a particular interest in watershed rehabilitation. With his encouragement and advice, the Jaramogis developed a community reforestation plan to rehabilitate the watershed, and the Representative negotiated a verbal agreement with WASA allowing the community to use the land. This agreement was sealed when the Chairman of WASA planted a ceremonial tree on the land in 1991.

With the assistance of the Tropical Re-Leaf Foundation (TRF), an organisation founded by the same Parliamentary Representative, community reforestation activities in the watershed then began in earnest. The Representative secured forestry training for Tacuma, and in 1994 Akilah Jaramogi⁵, who was then working for Forestry herself, requested and received from the Fire Services fire prevention training for herself and members of neighbouring communities. Since then, the Forestry Division has provided assistance under its community forestry programme in the form of salaries to members of the community fire patrol during the dry season. A 1995 community reforestation *gayap*⁶ in honour of Tacuma Jaramogi became an annual institution.

During the early stages, funding was secured by TRF for activities in Fondes Amandes. By 1999, however, the group was beginning to seek its own funding. Needing a name and organisational structure to apply for a grant from a community development fund, they named their initiative the Fondes Amandes Community Reforestation Project (FACRP) and established a small formal membership. The FACRP brochure defines the objectives of the project as follows:

- restoration of the watershed through the planting of trees;

⁵ Tacuma Jaramogi died in 1994. Since then Akilah Jaramogi has been the acknowledged community leader and spearhead of its watershed management initiatives.

⁶ A Trinidadian term for events in which community members and other volunteers get together in groups to carry out activities beyond the ability of individuals or families.

- protection of the watershed through the prevention of further deforestation from bush fires; and
- improvement of the quality of life of the community through:
 - the creation of employment and livelihood opportunities
 - provision of basic services and facilities to the community
 - facilitating social cohesion.

From the outset, the objectives of the initiative have been multiple but with a strong social and livelihoods focus to address the high levels of unemployment and the fact that most people had to seek work outside the immediate area. There was no pipe borne water in the community and the nearest standpipe was almost a mile away; so households relied heavily on river water or rainwater harvesting for their water supply. The rehabilitation of the hillside, coupled with organic farming methods, would not only provide food but also help to reduce the impact of soil erosion on the river. Tree varieties were therefore selected both to encourage wildlife and to provide materials for a variety of cottage craft industries intended to provide additional local livelihood opportunities for the community.

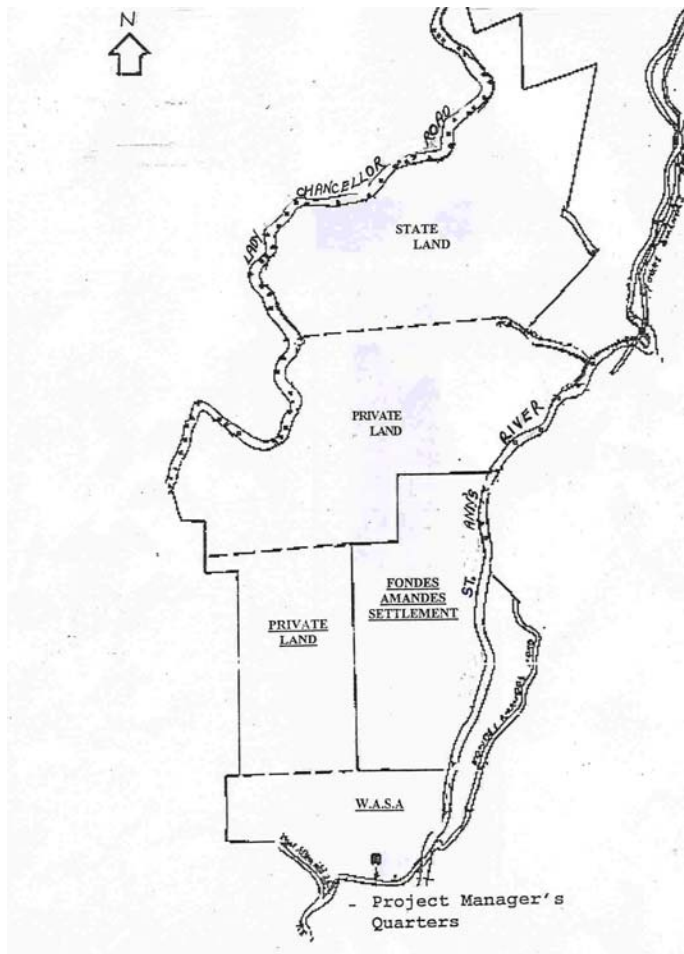
The FACRP has attracted a number of supporters in addition to TRF⁷ and the Forestry Division, receiving funding and technical assistance from embassies, local NGOs and private foundations. Largely at the urging of these partners, in August 2006, the FACRP adopted a formal constitution and Board of Directors that includes a number of members from outside the community in order to assure the range of skills required.

Current status

With this assistance and their own ongoing efforts, Akilah and 17 other community members have transformed what was once fire climax grassland into an impressive 30-hectare organic agro-forestry project. Project activities take place on both privately-

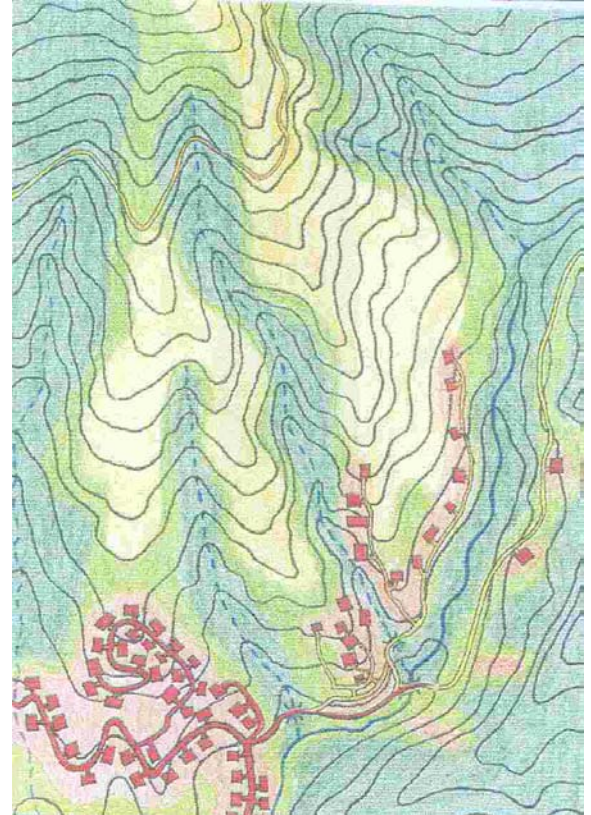
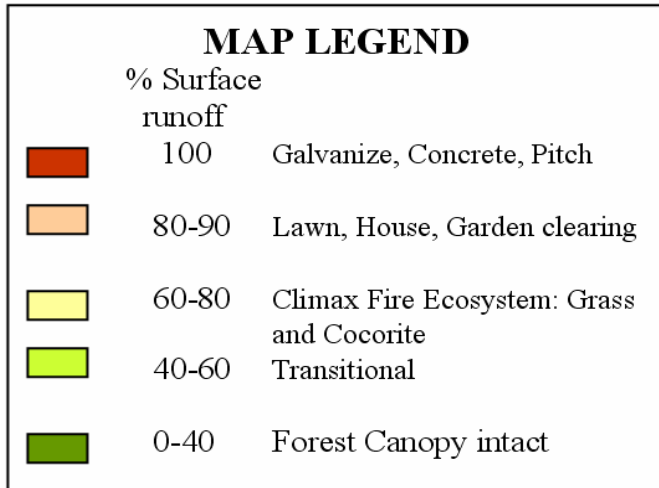
⁷ Based on the success of the FACRP, TRF applied for and received a United Nations Development Programme Global Environment Facility small grant to develop a project engaging other communities in watershed management and reforestation in degraded portions of the Northern Range.

owned⁸ and WASA state land, spanning the lower watershed to the ridge in the upper watershed (See Maps 2 and 3).



Map 2: Ownership pattern of the Fondes Amandes Development
(courtesy Eden Shand)

⁸ While the private landowners have made no effort to evict the group from the two 12-ha parcels it is using, neither have they provided any form of lease or even verbal permission for its use.



Map 3 view of community settlement pattern and other anthropogenic factors

Courtesy John Stollmeyer

Annual tree planting and fire trace cutting community *gayaps* are held in support of the re-forestation and fire prevention programmes. At the beginning of the annual dry season, personnel from the fire, forestry and water resources management agencies, together with community members, launch a Forest Fire Protection Programme, which formally and symbolically reaffirms the continuing need for watershed rehabilitation and protection and the desire for continued collaborative efforts.

Tree planting takes place at the start of the rainy season and fire traces are cut at the beginning of the dry season. The rest of the year is spent maintaining the traces and creating new ones. The area has been fire free since 1997.

In line with its social and environmental objectives, the FACRP has adopted a holistic approach to project development, which goes beyond just watershed reforestation and rehabilitation and now encompasses or has stimulated the following initiatives and achievements:

- The establishment of the Clean Trees Organic Nursery (CTON) in 2001 and the conversion of the area into a completely organic project that does not employ chemical pesticides or fertilizers. As the for-profit subsidiary of the FACRP, CTON acts as a community-based organic tree nursery, generating employment and training opportunities for community members. It provides a reliable source of organic inputs (plants and seedlings, manure and compost) to the FACRP's reforestation activities as well as to small-scale farmers and other individuals interested in organic methods of farming and agriculture. It also provides landscaping and lawn maintenance services.



**Fondes
Amandes
Nursery**
(source
CANARI)

- Creation of a community-wide composting and recycling programme, established by FACRP in collaboration with CTON.
- Launching of Fondes Amandes Community Eco Tours, in 2003, offering tours mainly for schools, although brochures are also sent to embassies. These tours provide information on the project and its activities and on fire prevention. Planning has begun to develop historical and ecological tours which will be marketed to urban tourists, and a small number of cruise ship passengers. Increasingly schools are also partnering with FACRP on projects which involve

the school children actually contributing to activities such as reforestation, particularly during the July/August vacation.

- Training of community members in how to make crafts and other saleable items using the “fruits” of the project. It was intended that craft and cottage industries would be set up in 2003, but this has not fully matured. A cooperative is to be established to facilitate the sale of these items to the public.
- Construction in 2001 of a community shelter, a long-standing dream of the FACRP, with support from a local charity. This facility serves as one of the community venues for training programmes.
- Establishment of an education outreach programme that educates school groups about the importance of watershed protection and the benefits of alternative (organic) agricultural practices.
- Creation of a cultural and drumming group.
- Establishment of a thriving jewellery-making business, run by Akilah, using seeds from the trees planted on the hillside, which now sells its products throughout the Caribbean region.



Children at the 2005 Gayap learn about drumming

Jewellery and leather craft on display at the 2005 Gayap

(Source for both photos <http://www.triniview.com/gallery/>)

A chronology of the project is presented in Appendix A.

FARCP's environmental and socio-economic impacts

The most obvious environmental impact of the group's efforts has been less fire damage and more trees. Although no systematic monitoring or evaluation system exists for tree losses, assessments are made after a fire and trees replanted as necessary. Akilah estimates that 15,000 trees have been planted to date and approximately 12,000 have survived.

The most important social impact of the project may be the security it has offered members of the community. The Ministry of Housing's greater Port of Spain regularisation programme includes Fondes Amandes in Phase I and may eventually offer community members a more effective solution to the stigma of being perceived as a squatter and the problem of lack of collateral. However, it is also likely to limit further infrastructural and housing development in the upper watershed, while improving the provision in the lower watershed. In the meantime the success of the FACRP is perceived to protect the group's land tenure even in the absence of formal regularisation (Akilah Jaramogi, pers. comm.).

The project has been sustained over time through the continued involvement of community members who initially became involved in youth activities organised by FACRP. The project has not had as widespread an economic impact on the community as originally hoped, however, in part because many of the activities provide only seasonal employment. The FACRP offers some employment opportunities and this has increased with the recent award of a government reforestation project which will require some 30-35 employees. However, the initiatives listed above demonstrate that community watershed management has the potential to support livelihoods, contribute to community cohesion and improve the provision of physical infrastructure, although efforts to secure better infrastructure and water facilities are still ongoing.

Constraints and challenges

In spite of these achievements, the project has not been without its challenges. In the early years, there was social tension between the settlers and the 'elites' in the residential community of St. Ann's. The elites felt that the settlers were deliberately setting fires in the hills and therefore did not approve of or understand their activities and often refused

to support group activities. However, with the intervention of the TRF and gradual recognition and support from other credible agencies and organisations, these residential home owners began to appreciate the value of the settlers' watershed work, even if not to engage in the activities themselves.

Over the years, many private landowners on whose land the project is conducted have threatened to establish housing developments on the hillside which would block access to the state lands in the upper watershed and signify the end of activities in the mid watershed. These threats have reportedly decreased over time, although the reasons are not clear.

Although the community, on the whole, is cohesive, with community members benefiting in different ways from the execution of the project, not everyone in the community shares the same enthusiasm for the project or chooses to engage in its activities. Reasons for this include personal preferences not to engage in this type of work, but may also be tied to the project's inability to guarantee a steady or sufficient source of income.

There have also been difficulties in gaining the participation of residents, especially younger ones, in FACRP activities. In Fondes Amandes, as in the rest of Trinidad, agricultural work is frequently stigmatised by parents and teachers as 'inferior' to other kinds of employment, resulting in increasing unwillingness of young people to become involved in activities such as reforestation. Consequently, some of those employed in the FACRP come from the wider St Ann's community.

Finally, the project has not provided a lasting solution to the settlers' lack of land tenure and general livelihood insecurity. The land they live on and that is currently used by FACRP is essentially on loan, with no formal contract for the use of state land and a nebulous situation in relation to the private land where the owners have neither formally granted permission nor objected to the current use.

Institutional aspects

While the institutional framework through which the FACRP evolved and continues to operate is informal to a surprising degree, it is built upon a solid foundation comprised of at least four pillars. The unwritten but acknowledged arrangement with WASA provides

the use of the land⁹ and some measure of recourse if that use is threatened. The relationship with Forestry is made up of a number of arrangements, both formal (individual work contracts) and informal (for example, occasional training or technical assistance). For funding and other forms of support, the project has successfully relied on its network of donors, advisors such as TRF, and neighbours, particularly the small farmers legally resident in the area. Finally, the group of community members that make up FACRP has slowly coalesced into a formal, structured institution that is capable of negotiating with and coordinating the inputs of the other “pillars”.

This framework has emerged despite the fact that there is no overarching policy, institutional or legal framework at the national level that covers partnerships for watershed protection between legally designated watershed managers, such as the Forestry Division and WASA, and a community or community-based organisation. It also evolved over a long period when the group of people behind the FACRP was itself loose and informal, with Akilah Jaramogi the group’s visionary and one constant presence. That lack of a recognisably democratic form of governance and clarity over the group’s membership has been a concern to FACRP’s supporters, and constrained the group’s ability to enter into formal management agreements with government agencies. The recent creation of a formal structure and Board of Directors is the first step in a process of transitioning into a community organisation registered with the Ministry of Community Development. This change will open up new avenues through which the group’s efforts can be rewarded, but it may also bring disadvantages and new challenges as Akilah’s charismatic leadership is replaced by a corporate institutional structure.

⁹ While WASA has consistently refused to give the community a “letter of comfort”, it has on occasion provided letters to potential FACRP donors indicating that the group is allowed to use the land and has also provided funding for FACRP training activities.

ANALYSIS

Who is benefiting and how?

WASA and its customers

Since the start of the reforestation and watershed management activities in Fondes Amandes, no attempt has been made to quantify or monitor its impact on watershed services. Nonetheless, senior water resource management personnel at WASA acknowledge that the protection and management of the area above the St. Ann's reservoir have at a minimum helped to hold back declines in these services, and are also likely to be reducing WASA's costs for water purification and cistern cleaning (K. Meade, pers. comm.). WASA has accrued these savings and other benefits, including the public relations benefit of supporting a community initiative, at very little cost to itself. It has also made no irrevocable commitment allowing the FACRP to use its reservoir lands, and can retract this privilege whenever it ceases to be in its interests.

Forestry and watershed residents

Periodic fires were for decades a serious problem in the Fondes Amandes watershed, causing damage to state forest resources, destroying crops, and threatening residential areas. Largely thanks to the FACRP's voluntary actions, the area has been free of fires for nearly ten years. This represents a substantial benefit to local residents (including the St. Ann's elites), and a tremendous savings to the state in the cost of forest protection and fire fighting.

Fondes Amandes community residents

In exchange for the services the FACRP provides, the Fondes Amandes settlers have gained a place to live and farm, income opportunities through fire patrolling, and access to resources for community projects and skills training. These benefits have limitations however: the residents have no security of tenure over the long term; the work opportunities in fire patrolling are limited, seasonal, and poorly remunerated; and securing grants, training, and technical assistance can require considerable effort and may not always be successful.

However, the vision and philosophy behind the FACRP, which emphasises self-reliance and the importance of natural resources to sustainable livelihoods, may have contributed to the enhancement of residents' livelihood assets¹⁰ in a range of different ways. FACRP activities such as training in craft making with local materials have provided participants with new revenue-earning skills. The project has also built social capital in the community by demonstrating that illegal settlers can be responsible land stewards, and by creating support networks with powerful civil society and government institutions. And the reforestation work itself has protected farm plots from fires and soil erosion and improved soil quality through nutrient cycling. It is important to emphasise that these benefits are generated internally by the community's work and not through any incentives or compensation provided by other beneficiaries of its watershed protection activities.

People living in the community who have not participated in FACRP activities have also benefited as “free riders”, and this appears to be a source of some irritation to project leaders. However, the reforestation activities themselves have reduced the number of farms that the area can sustain and so discouraged the settlement of new squatters unwilling to be part of the initiative.

FACRF supporters (NGOs, donor agencies, private sector)

The fourth major group of actors in the FACRP story is an interesting one because its benefits are less visible, and it is therefore more difficult to explain their motivations on the basis of environmental service market theory. These project supporters, including Tropical Re-Leaf and national and foreign funding agencies, have played a crucial role in building the community's capacity to be good watershed managers and in supporting its efforts to expand residents' livelihood opportunities. The motivating factors may be different for each of these actors: for Tropical Re-Leaf, it is to contribute to the organisation's larger mission of improving the conservation of Trinidad's forests; for the foreign embassies, it may reflect a foreign aid policy focused on reducing poverty and

¹⁰ The concept of livelihood assets (e.g., Carney 1998; Scoones 1998) provides a framework for understanding the extent to which the livelihoods of poor rural people are robust and sustainable. The concept is premised on the idea that rural livelihoods are based on five forms of “capital assets”: natural, social, human, physical, and financial capital. Institutional or political capital is also sometimes added to the framework.

increasing livelihood security; and for the private sector foundations, it may be part of a public relations strategy.

What role might economic instruments play?

Factors contributing to FACRP's sustainability

The project has been successful in generating livelihood benefits for community members, and these benefits have been perhaps the most important factors in the project's sustainability. While some of benefits have depended on the actions of others, many have been developed by the group itself, sometimes with the support of partners.

The agencies with formal responsibility for watershed protection, WASA and Forestry, have clearly employed various forms of incentives and rewards to maintain and expand the scope of this community initiative. Some of these incentives have cost the agencies very little, but have had a significant value to the community. For example, WASA assisted Akilah to secure utilities for her dwelling, something that is generally impossible for residents without formal title to their property. Sometimes, however, the group has had to work hard for the rewards offered by government. While the salaries paid by Forestry to community fire patrol members are important sources of revenue for some residents, the absence of an enabling policy and legislative framework to support community participation in forest management means that the FACRP has to make a formal request for salaries on an annual basis.

The Rastafarian lifestyle and sense of community has also contributed to a culture of volunteerism and community effort. This factor appears to operate independently of more tangible incentives and rewards.

Local foundations, NGOs and foreign embassies have supported the project despite having no mandate for watershed management or receiving any direct benefits from project activities. However, this assistance remains on a small scale, which has encouraged project members to focus on developing greater self sufficiency to ensure the long-term viability of the project.

What this analysis seems to indicate is that while incentives and rewards are a factor in the sustainability of the Fondes Amandes initiative, they are far from being the only

factor, and there is little evidence that they alone would have been enough to keep the project alive over its 25 years of existence. Nevertheless, more systematic and generous incentives and rewards may have produced a more substantial impact, and may be required to sustain the project in the future, especially if the economic self-help initiatives of the group are unsuccessful, the local community culture begins to break down, or the project's NGO, donor agency and private sector support diminishes.

Options for securing the arrangement

If the government and other beneficiaries of the Fondes Amandes community's work are interested in assuring that the arrangement continues into the future, a more structured and systematic approach to incentives and rewards might be worth investigating. Some of the options that the government could consider include:

- *formalisation of the right to occupy and use state land*: Illegal occupation of land is tolerated but frowned on in Trinidad. Government agencies often feel that any action on their part to enter into formal agreements with illegal settlers may be perceived as encouragement of illegal activity. The prevailing practice is to regularise settlers who have been established on state agricultural land for at least five years prior to 1998, but to discourage new settlers. Under this policy, the Fondes Amandes settlers would qualify for regularisation of tenure;
- *formalisation of the right to occupy and use private land*, either through state acquisition of the land or through formal lease arrangements between the land owners and the FACRP;
- *contractual acknowledgement of and payment for the services provided by FACRP*, based on an assessment of the value of the services to the management agencies, the direct beneficiaries and the wider society.

A meaningful consideration of any of these options would require addressing some difficult issues.

Equitable negotiation

The first challenge would be to find a way to negotiate fairly within the context of relationships now characterised by a high level of inequity. The current arrangements

have provided benefits for Fondes Amandes residents, but they have also entailed significant costs to them, while the net benefits to others in the arrangement have been quite high. Some of the ways in which the current arrangement is unequal include these:

- The perception of the Fondes Amandes community is that it does not receive the clean and abundant water supply from which other St. Ann's residents benefit as a result of FACRP's services.
- The opportunity cost to FACRP group members, particularly in terms of the time currently donated on a voluntary basis to assuring the project's success, may far outweigh that of the Forestry Division or WASA through their temporary and insecure 'donation' of state land on which there are currently no plans for development.
- The community's level of risk under the circumstances of insecure land tenure and government support is very high, although WASA also bears a significant risk in letting the group settle and farm on the land around the filter bed and upstream from the reservoir, since it could be very difficult to remove the settlers after a certain period of time even if they were no longer fulfilling a watershed protection role.
- While all stakeholders record some degree of satisfaction with the current arrangements, the level of frustration felt by the community is significantly higher, notably in relation to the insecurity of the arrangement and the contribution to livelihoods as well as the lack of acknowledgement or compensation from the elites in St Ann's.

These factors, and particularly the power that the government and private landowners hold to turn the settlers off the land they are using, makes any balanced negotiation over compensation for the group's services extremely difficult.

Valuing the services provided

The contributions of the FACRP have so far not been measured or quantified, which makes determining the level of compensation it could receive quite difficult, but not

entirely impossible. The project beneficiaries clearly perceive that the services have a value, which is reflected in:

- the willingness of government, private sector and civil society organisations to make contributions;
- the community's continued willingness to implement the project, often on a voluntary basis, in spite of the insecurities;
- the consensus of the management agencies that the group provides valuable watershed services including improved fire protection and protection from contamination and excessive siltation of the filter bed and areas upstream of the reservoir.

Simple options for assigning a value to the group's contributions could include assessing the cost of using alternative personnel or agencies to carry out the same activities and/or the cost of potential losses (e.g. through flooding) if the group were not to carry out these activities at all. Similarly, the benefits the FACRP receives in terms of free land use, financial support and capacity building could be quantified.

The exchanges of services and benefits that could warrant a more comprehensive valuation as a basis for establishing fair compensation mechanisms include:

- the benefits to Forestry of improved fire protection and the savings in terms of Forestry personnel to achieve this;
- the reduction in WASA's water treatment costs as a result of the work of the group in clearing the area above the St. Ann's reservoir;
- the benefits of the watershed protection services to the private landowners;
- the benefits in terms of improved water supply and quality enjoyed by the St Ann's residents.

Exploring alternatives to economic instruments

A third aspect that would have to be addressed in any consideration of a formal compensation arrangement between the Fondes Amandes community and government or other beneficiaries is whether such an arrangement would be the most effective means of

sustaining the current arrangement. This case study has shown that while the financial and semi-financial (e.g., informal allowance to use state and private land) incentives and rewards have been important factors in the project's longevity, they have not been the only factors, and much of the motivation for the project continues to be generated within the community itself. The case study better illustrates how incentives and rewards may be useful in sustaining a community initiative than how they can be effective institutions for watershed management on their own.

LESSONS LEARNED

The FACRP case study demonstrates that under certain conditions informal and *ad hoc* arrangements between community-level watershed managers and their beneficiaries can contribute to improved watershed services, even when external incentives are limited and compensation is sporadic and inequitable. The keys to the success of this initiative seem to be:

- the direct livelihood benefits that the FACRP provides to community members;
- the credibility that government recognition and endorsement (however limited) brings to their activities;
- the supplemental rewards, in the form of grants and technical advice, provided by external parties including local foundations, donor agencies and NGOs.

The project also provides some interesting learning regarding the design and use of economic incentives and market-like compensation mechanisms for watershed management.

1. Diverse factors motivate watershed service “providers”

The FACRP case confounds the widespread belief that those without land tenure will not invest in sustainable land management practices. On the contrary, in this case Fondes Amandes residents have invested in watershed protection activities in part in order to maintain their access to the land on which they have settled. Other factors have included the benefits they receive from being part of the project, ranging from fire protection to employment opportunities to new skills. Rastafarian beliefs about nature and people’s obligation to respect it have likely also been an important factor.

2. Direct benefits are not the only motivation for “buyers”

Many of the incentives and rewards the Fondes Amandes group has received came not from direct beneficiaries of their watershed activities, such as WASA and Forestry, but from organisations and agencies, such as TRF, with no direct stake in the protection of the St. Ann’s watershed. These supporters were motivated by a range of factors that were only indirectly related to the services that the FACRP was “selling”. The interest of such

types of “buyers”, not in a specific product or service but in supporting broader objectives such as forest conservation at a national level or livelihood security for poor rural people, appears to be one of the ways that environmental service markets differ from more standard types of markets.

3. Government plays an indispensable role

FACRP was initiated and existed for a number of years before government became involved, but met with limited success. Government buy-in, and the provision of an enabling environment for participatory approaches to watershed management, are important for the success and longevity of community-based projects, particularly in cases where the land is state-owned. It may not always be possible to gain government’s total commitment from the outset, but even limited buy-in helps in securing funding and partnerships both within and outside government.

4. The value of services and benefits is relative and compensation is therefore negotiable

Stakeholders’ perception of the worth or value of the services they offer or benefits they receive ultimately determines their willingness to continue investing in the arrangement. It may not always matter to them that the values have not been economically quantified. However, the gain must be perceived as greater than the loss. In the absence of any urgent or overriding political or economic plans for the area, agencies such as WASA and the Forestry Division will continue to provide support as long as they are continuing to benefit from the work of the FACRP. The Fondes Amandes community will continue to provide the service so long as the return is seen as worthwhile. However, quantification of the value of the community’s services would provide the foundation for more equitable processes of negotiation. Although the requisite financial and other baseline data is often not available in the Caribbean, proxy methods of valuation can often be employed.

5. There is no single template for effective community institutions

Much of the literature on community-based resource management stresses the need for strong community institutions and formal contractual arrangements. Some of FACRP’s

supporters have therefore been alarmed at the informality of the project's institutional arrangements and the lack of systems for democratic decision-making within the group. However, the project has existed and even thrived for more than 20 years, with apparently a high level of support among community members. It appears that the strong and proactive leadership of Akilah, rather than a more orthodox community organisational structure, has been the lynchpin holding the project together.

CONCLUSION

While the Fondes Amandes case offers some evidence of the usefulness of economic incentives and rewards in encouraging good watershed practices by communities, it more importantly shows how such instruments may be only one of a complex mix of factors that motivate the actions of watershed stakeholders. In assessing approaches to watershed management, governments, donors, environmental organisations and other interested actors should not assume that any one approach, whether environmental service payments, community-based initiative, or state regulation, is the most appropriate to a given situation. It is more likely that a dynamic mix of mutually reinforcing approaches will have the greatest sustainability and effectiveness.

This is however not to say that existing arrangements cannot be enhanced through the use of economic incentives and rewards. Both have clearly been important in sustaining the FACRP, and more systematic and equitably negotiated forms of compensation may be quite useful in assuring the continuation or encouraging the expansion or replication of the existing arrangements. There is little evidence, however, that more market-like instruments based on valuation of and charging users for the services that the FACRP is providing, would be useful or even possible in the existing context and policy environment.

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Appendix A

Chronology of Fondes Amandes reforestation efforts

1970s	Squatters begin moving onto abandoned private plantation lands and public lands at Fondes Amandes, with intention to establish a Rastafarian farming community. Settlers eventually driven out by government.
1979-1982	The Jaramogis return to the area to farm and, trained through Tacuma's work in the Forestry Division, begin inter-cropping trees as a way to control erosion, flooding and annual brush fires on the hillside.
1987-1991	Jaramogi efforts begin to have an appreciable impact on watershed services, and activities coalesce into a community forestry and livelihood enhancement initiative with the support of the community's Parliamentary Representative, a forester.
1991	TRF persuades WASA to formally recognise the contribution of the group's efforts to the improvement of the St. Ann's water supply, resulting in the Chairman of WASA giving verbal consent to the group to use WASA lands around the state reservoir for their tree planting activities.
1997-present	Area has been free of the fires that once caused regular damage; this is widely attributed to the group's reforestation and fire control work
Present	WASA acknowledges increased water supply and some improvement in quality, and attributes this to group's efforts. Forestry Div considers group to be providing effective watershed rehabilitation service at low cost to Government. Both agencies apparently willing to continue to provide small incentives and compensation to maintain the current arrangement.