

Developing a Sustainable Eco-Tourism Framework For the Cordillera Region of the Philippines

A look into an alternative development path for
the Central Cordillera Region of the Philippines

by:

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Abstract:

The Cordillera Eco-Cultural Trails project deals with the utilization of existing trails in the Central Cordillera region as a form of alternative development to promote the sustainable use of natural resources in this mountain region as well as the enhancement of existing ecosystems found across the entire path that is covered by the trail.

The Eco-Cultural Trail project also envisions providing an added sustainable source of livelihood for the communities and villages that are covered by the trail through responsible eco-tourism. This paper attempts to show the processes which influence the creation and management of the eco-cultural trail as well as provide relevant recommendations which would apply to its use and sustainable management.

Introduction:

The Cordillera region of the Philippines is acknowledged as one of Northern Luzon's major watersheds. The headwaters of many of Luzon's major river systems originate in these mountains and serve as irrigation for the plains that surround the Cordillera Mountain range; Chico River, Agno River, Abra River, Siffu River, Amburayan-Naguilian-Aringgay River System, Ahin River, Abulog-Apayao River system. Taken together they have a total drainage area of 5,447,500 hectares¹, supplying most of the irrigation needs of Northern Luzon. These facts alone underscore the importance of the Cordillera mountain region in providing ecosystem services to a large portion of Northern Luzon.

Yet this is only a small fraction of the importance of the Cordillera Mountain Ecosystem, other factors such as biodiversity, energy production; mineral production as well as ecological maintenance functions such as; stream flow, nutrient cycling, soil stability, habitat, are among the other factors which make this region unique.

For the local populations living within these mountains the environment is of great importance. As in most mountain areas the communities depend directly on the environment for their livelihood, the degradation of the environment which has been occurring throughout the region in recent years has raised the concern of the communities living within these areas as well as special interest groups who have decried the continued degradation in the mountain region.

This is especially evident in the rural areas where the primary resource base is still tied to the land, forests and waters, the degradation of which results in; the ecosystem's reduced capacity to sustain local livelihoods, an increased vulnerability to natural disasters, as well as health problems that arise from the degradation or contamination of the environment.

¹ CPA, 2001

In 2003 the NSO measured the poverty incidence of Cordillera families to be 24.8%². The United Nations defines poverty as those who live on less than \$1 per day, although we may argue that this refers to “abject income poverty” and that this does not necessarily mean that people living at this level are necessarily hungry or have malnutrition, the cash economy has produced a society in which monetary transactions are a necessity to life. Even in the most remote areas in the Cordillera region who subsist on swidden farming and subsistence agriculture, will at a certain point have to deal with monetary expenses arising from health, education, trade, and other expenses that are a necessity to modern life. These added costs often force communities to abandon subsistence agriculture for cash crops in some cases intensified natural resource use which results in the degradation of the local environment.

Poverty forces people to overexploit natural resources, leading to degradation of the very forests, soil, and water upon which they depend. This perpetuates their poverty. Economic growth may alleviate poverty and lead to a higher quality of life if properly planned, it may also reduce pressure on the environment and stem to environmental degradation. However, unregulated and unplanned economic growth can have the opposite effect. Pressure on the environment may be increased, environmental degradation may occur at greater rates, and the sustainability of ecological and economic systems may be compromised.

The current economic predicament that the Philippines is in, has in recent years promoted a more liberal policy in the management of its natural resources, the rich natural resources present in the Philippine Islands are still the largest source of capital for the country.

Thus the trend of large-scale natural resource extraction to reap immediate profits has promoted the proliferation of large scale mining, logging and large infrastructure projects such as dams and highways that intend to promote rapid economic growth and reduce the incidence of rural poverty. Although well meant these policies have in most cases worsened the predicament of the local populations, often degrading the environment beyond repair,

² National Statistics Coordination Board, 2003

rendering the local ecosystem no longer viable to support the local community's needs and often the impact of these activities reach downstream to the lowland plains³. Aside from the degradation of the ecosystem, the promised economic benefits to the communities affected are often not realized.

The mountains of the Cordillera Region provide a tremendous amount of ecological services for the island of Luzon yet as with most mountain environments it is also incredibly fragile, its peoples are often marginalized politically, economically, culturally and geographically thus there is a need for special consideration and management of its resources.

The Cordillera Eco-Cultural Trail project is one such alternative development path. Using the trails as the central point for development, it shows much promise in developing the mountain region in a sustainable manner that would benefit both the mountain communities as well as downstream users who benefit from the ecological services provided by the mountain environment.

Mountain trails interconnected the entire Cordillera region from each Settlement from Ifugao to Benguet, a vast web of paths that linked Villages and people with one another. Fr. Angel Perez in his *Igorrotes Estudio Geografico Y Etnografico* describes one such trail: "...the one in the south starts in Cervantes and passes through Comillas...the main one continuing on to Mancayan and Suyoc until it enters the district of Benguet through Loo. It is 28 Kms long. From Suyoc a branch leaves for Lipatan or Lahutan, Quiñga and Asin up to Sapao, which is an Igorot trail." ⁴

400 years after the first foreigner set foot on the islands, many of the trails that have served as links between villages are now gone, replaced by dirt roads that have cut through the landscape like giant scars on parched earth.

³ E.g. reduced water flow, contaminated river systems, contamination of coastal areas, landslides etc...

⁴ Fr. Angel Perez *Igorrotes Estudio Geografico Y Etnografico*

Still, even with the advent of modern transportation and endless tracks of roads, trails are still considered as the highways that connect villages and peoples with one another, in fact many kilometers of trails still exist and are still much in use in over half of the settlements found in the Cordillera Mountains.

These trails, mostly known only to the local residents, are located in pristine ecosystems and areas of high ecological significance. They are also located in the areas which are of much historical and cultural value, with some of the trails dating back to the Japanese General Yamashita as he fled through the mountains to escape the American and Filipino forces during the war and even as far back as the early Spanish period during the time of the missions and even before that, trails used by the Igorots for trade and travel through their mountain homes.

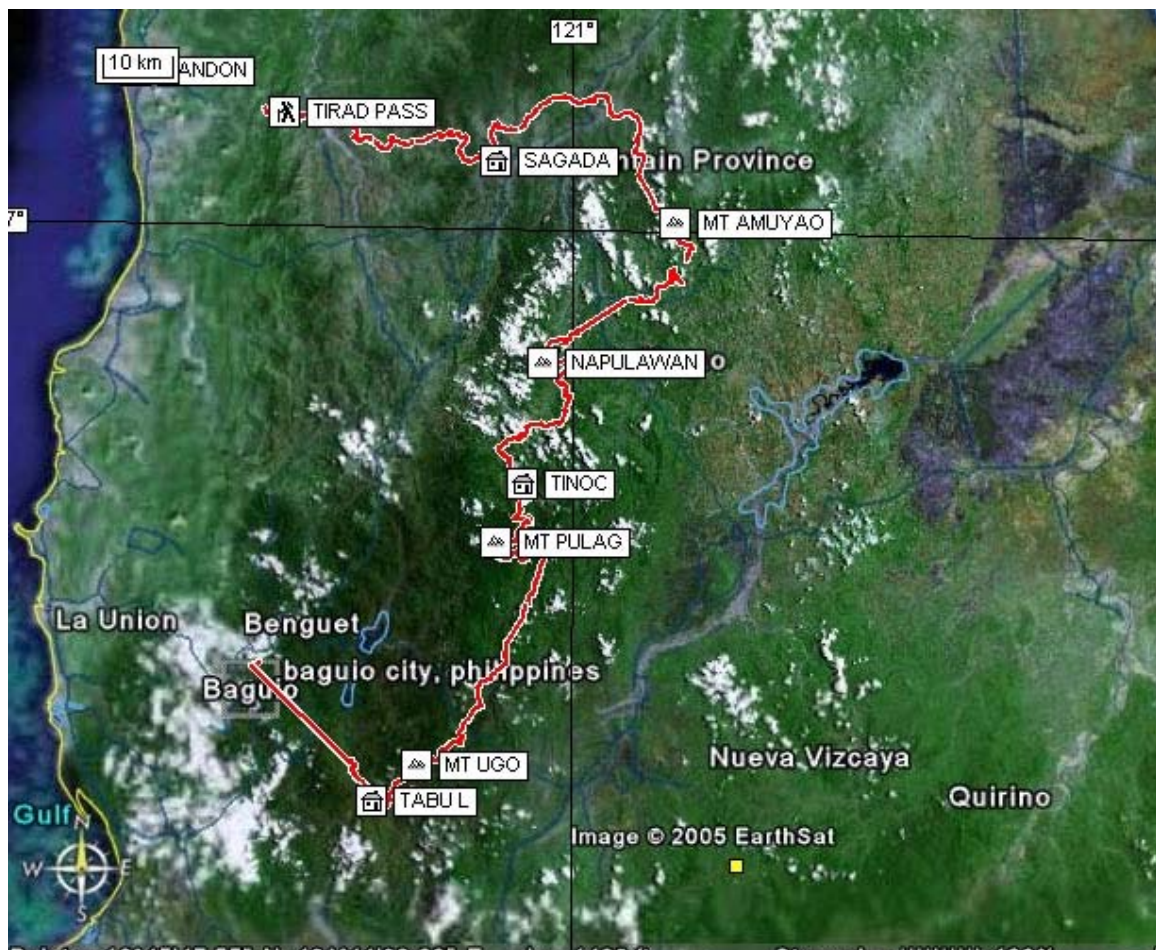
These trails are a Cordillera Resource that is currently underutilized and often have been put on the bottom rung of provincial priorities, seeing them merely as remnants of a past which the people cannot wait to remove and replace with concrete. Yet these trails offer something which the roads or what we may call as “Modern Development” cannot, as they are located in areas of ecological significance and as such the trails have the potential of being used as a tool for conservation and sustainable development.

The mere fact that many trails are still in existence over the entire breath of the Cordillera Mountains from north to south means that this development path can be applied over most areas in the region without any substantial establishment costs and be an instrument by which the mountain ecosystem so important to this island’s life and economy may be developed sustainably.

The Cordillera Eco-Cultural Trail project in the Central Cordillera covers the provinces of Benguet, Nueva Vizcaya, Ifugao, Mountain Province and Ilocos Sur; these areas covered by the trail are located in the headwaters and tributaries of 70-80% of the Cordillera region’s major river systems and in areas of high cultural and ecological significance, thus with an enormous potential for scientific, educational, and eco-tourism development. It seeks

to create a continuous trail system that connects these regions existing trails to create a management area such as that of the Annapurna Conservation Area in Nepal or the Trail Circuit in Mustang in Bhutan.

The project seeks to create an alternative development path in the areas of the Cordillera region that still have an abundance of natural wonders. Creating a development path that is appropriate to the natural and cultural ecosystem of the Cordillera Mountains.



The Central Cordillera Trail

Problem Statement:

We are fast losing this resource and the surrounding areas that make the resource a valuable commodity in terms of development for eco-tourism and associated uses that make pristine areas a valuable commodity. Every year countless kilometers of the trails are converted into roads opening the areas surrounding them to further destruction and destroying any historical, educational and ecosystem values that are associated with the trails and associated surroundings

Degradation of the ecosystem in these areas makes them less suitable for use for eco-tourism, this degradation also affects the livelihoods and health of communities as more often community capital is tied to the land, waters, and forests –destruction of which deprives them of this natural capital and exposes them to adverse environmental factors

Trails Development for Trekking

The Cordillera trails project envisions using the already existing trails in the Cordillera region as venues for sustainable development and environmental conservation. The Cordillera region of the Philippines is replete with natural and cultural wonders and is already a destination for many foreign and local tourists, but this tourist activity is mostly located in the already heavily populated urban areas such as Banaue, Sagada, Bontoc, etc... the interior mountains where most of the remaining trails still exist and rural poverty is most felt shows the greatest promise for this type of development.

The interior mountain areas are characterized mostly by villages that practice subsistence farming of rice and Camote⁵ and small scale livestock farming. Most economic activities to augment income for goods and services not available within the village are through either occasional labor in neighboring villages or urban centers, planting of cash

⁵Commonly known as sweet potato this is a good source of calcium, potassium and vitamins A & C. This is also a very good source of Carbohydrates

crops on swiddens⁶, selling of crafts, pocket mining and gold panning, or from external sources such as families who have relatives working in the cities and abroad who send money back home.

In these interior mountain villages trails are the essential routes of trade and communication and are used by the local villagers for the most part for travel between one village to another, traveling to farms, or to get to areas which are accessible to modern transportation for travel to the urban centers to sell their produce or crafts. Contrary to popular belief that we are now in the modern age in the Philippines and road networks cover the entire archipelago, in the Cordillera region much of the interior mountain areas are still interconnected by trails, in fact you could walk the whole span of the region through these trails that link one village to another.

The prevalence of the trails in the region and the fact that they are located in the interior mountain areas where the environment is mostly pristine means that there is a potential for these trails to be used to conserve these resources and develop the mountain environment in a way that is in line with its natural character. This development will also enable interior mountain villages who are often short of cash funds obtain added income through revenue from trekkers who will be using the trail. The fact that they already exist, means that there is little or almost no cost for establishment in fact most of the costs entailed would have to do with maintenance, management, and policy and trekking infrastructure development rather than the cost of trail blazing through dense undergrowth.

The Cordillera trails project aims to use some of these trails that connect the region and string them together to create a trekking route that would rival trekking routes in Nepal, Bhutan, and the Appalachian Mountains in the United States. Already these trails are surrounded by colorful cultures and pristine nature, development in this sense would entail only the care and protection of these precious resources in order to reap their benefits.

⁶ Usually Corn, Beans, or Peanuts

The trail development would enable the influx of funds from trekkers to support local economies and local villagers will also have an incentive to maintain and enhance their local environment –this in effect will also benefit the local villagers as the improved ecosystem will also mean that besides monetary benefits from trail development, local livelihoods which are dependent on the local environment will be sustained.

A Look at the Economy of Developing the Cordillera Trails for Trekking

In the countries that host trekking routes such as Bhutan, Nepal, Africa, Italy, USA, etc... the trekking industry has in fact produced its own micro economy with cash inflow not only benefiting the local villages but also producing revenue in associated industries that are in line with the trekking or the adventure business. In fact in countries like the United States and Europe the trekking industry is a multi-million dollar business from trekking agencies, magazines, to the outdoor gear manufacturers such as Patagonia, Mont Bell, North Face, Gregory, and many others producing jobs and investments for thousands of individuals from manufacturers, businessmen, vehicles, guides and many more. These associated industries rely as much on the pristine nature of wilderness areas as much as the trekker relies on their equipment to keep them dry and comfortable. The nature of its dependence on the “wild” as it is called is nature and a living environment that would promote an air of adventure and a place for quiet reflection, without which the entire outdoor industry would crumble.

The common perception that not many people would be willing to spend their time wandering aimlessly through the mountain regions may be intrinsically wrong. Looking at the experience of Nepal, of which trekking is actually the primary industry, in 1995 alone they issued 65000⁷ trekking permits this are 65000 people who are willing to pay the guide fees and walk hundreds of Kilometers through mountain passes. In terms of economic revenue this is enormous with each Trekker spending an average of \$50-\$200 a day this is usually higher (two or three times) in Bhutan which requires a high daily expenditure. For

⁷ Paul McMenamin. Trekking Routes Less traveled

1995 this translates to revenue amounting to approximately 3.25 million Dollars to 13 million dollars a year an enormous value for simply protecting the trails and their surrounding areas from destruction. In other words what I am pointing out is that people and in fact many and by many I am saying an endless supply of people will pay to carry a heavy pack and walk through hundreds of Kilometers of Beautiful mountain environments and colorful cultures.

Trekking tours in Mustang in Bhutan cost anywhere from \$4000-\$4500 per person for 18 days other treks that last longer cost from \$6000-\$7250 per person for treks reaching up to 38 days. This underscores the great potential of trekking development in areas similar to Bhutan such as in the Cordillera where a mixture of colorful cultures and beautiful environments will enable the same type of trekking development.

During the expedition the entire team of 4 spent approximately ten thousand Dollars. This expense includes; field expenses, equipment, medical expenses, transportation, communication, fees, and other miscellaneous expenses throughout the expedition. This translates to roughly sixty five dollars each per day or around three thousand five hundred pesos per day of the trek. If we are to look at an average of 2000 trekkers a year going through the trail for an average of 38-40 days, following limited trekking permits for sustainable trekking, this translates to approximately five million dollars or around 260 million pesos a year and these are only from direct expenses with very minimal or no fees for trekking in the region. If we are to follow Bhutan's trekking development which imposes a high daily expenditure for trekkers charging anywhere from 200-400 dollars a day for trekking permits we can expect to gain a revenue of approximately 16 million dollars to 32 million dollars a year or around 8000 to 16000 dollars per person trekking through the route. These are only direct expenses from the use of the trail and associated guides, porters, and trekking fees. Of course to justify the imposition of such fees one must also make sure that the trekkers are getting what they paid for, meaning a pristine environment and colorful cultures such as that of Bhutan.

Other economic benefits of this type of development include the development of sustainable enterprises that are not in conflict with the use of the trails for trekking. As aside

from the fact that most communities will not have to stop their traditional livelihood sources other sources of revenue aside from trekking will now be available to the communities due to their protection and enhancement of their local environment. The planting of trees and protection of forest areas to increase forest cover and assist in natural forest re-growth can be applied as for as carbon sequestration projects or due to the improved nature of the local ecosystem the local communities can now charge user fees for increased and better quality water supply with the downstream users. Other types of development such as sustainable farming of certain crops such as coffee and other traditional varieties of crops may also be done in partnership with the development of the trails even developing some portions of the farming as a part of the trekkers experience as they go through the trails in the area.

In most areas in the region the current development thrust is If you compare all of these to the cost and benefits of converting these trails into farm to market roads to promote commercial agricultural expansion we would see that the revenue alone from the trekking revenue of only 2000 people would be more than even ten times current revenue that is being garnered from the commercial agricultural industry and without the associated environmental costs such as degradation of the environment from deforestation, nutrient pollution, pesticide pollution, siltation, forest destruction due to road construction, destruction of biodiversity, and others which make commercial agriculture an industry that is far from sustainable in the mountain regions.

Below is a cost-benefit matrix of developing the areas for agriculture, and trekking.

Type of Development	Market Cost	Market Benefit	Environmental Cost	Environmental Benefits
Trekking Trail Development	Trail Establishment, Maintenance, Mapping Management	Trekking revenue CDM Ecosystem User fees	Little or no environmental costs if managed properly	Enhanced local ecology Decreased siltation of waterways increasing agricultural

		<p>Mixed Sustainable Land Use</p> <p>Associated industries of trekking: Outdoor Equipment, Trekking Agencies, Travel Agencies, Transport (Air and Land) agencies</p>	<p>production and reducing health risks to local communities</p> <p>Improved living and health conditions of the communities in the project area due to the enhanced state of the environment</p> <p>Downstream users benefiting from enhanced upland ecology –possible collection of user fees (water, irrigation, etc...)</p> <p>Biodiversity protection</p> <p>Increased Timber for local use in housing and other uses</p> <p>Sustainable supply of fuel wood</p> <p>Non-timber forest products and services (NTFPS)</p> <p>Preservation of</p>
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				<p>genetic information for agricultural and pharmaceutical use</p> <p>Recreation/Tourism</p> <p>Research/Education uses</p> <p>Cultural/Religious uses</p> <p>Decreased risk from natural disasters and more sustainable local livelihoods</p>
Agriculture	<p>Cost of farm to market roads</p> <p>Training for commercial agriculture</p> <p>Capital costs: seeds, fertilizer, pesticides, land preparation</p>	<p>Revenue from agricultural production</p> <p>Industries associated with agricultural production: Transport, Pesticides, Fertilizer, Farm Labor, Marketers</p>	<p>Deforestation</p> <p>Nutrient Pollution</p> <p>Pesticide Pollution</p> <p>Siltation of waterways due to agriculture and road development</p> <p>Air pollution from dust and vehicular pollution</p> <p>Increase in pests, flies, and other diseases</p> <p>Desertification</p>	<p>Maintenance of the rural environment as compared to the urban environment this is still relatively better</p>

			Land Degradation	
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Looking at this matrix of values shows that if all values both environmental externalities and market values are taken into consideration it shows that developing the areas for trekking has a greater net benefit than following the current development path of developing the areas for commercial agriculture.

Opportunities presented in developing the trails

Conservation and Eco-Tourism

Already the trail passes through several existing known eco-tourism destinations and places of cultural and ecological significance: Mt. Ugo, Mt. Pulag, Mt. Napulawan, Mt. Amuyao, Tirad Pass, Ifugao Rice Terraces, Sagada, etc... thus it can serve to enhance these areas characteristics

The trail can contribute to local conservation by promoting the sustainable use and enhancement of the areas that are covered by the trail. It will also provide added revenue to the local resource users that will support the local economy and prevent increased economic pressure on local resources.

The trails project can contribute to the conservation of areas that are assets for their development: parks, protected areas, cultural and natural sites, through financial contributions, provision of environmental infrastructure and improved management.

The project will help raise awareness of the local population with regards to the financial value of natural and cultural sites, makes them proud of this heritage and allies for its conservation. More widely, the involvement of local communities in tourism development and operation appears to be one important condition for the conservation and sustainable use of biodiversity

Education:

The Cordillera Trails project has the potential to serve as a novel educational tool for educating the youth of our natural and cultural heritage. It will also serve to promote environmental and cultural values in the people who trek through the trail.

Promote greater respect and understanding for culture and society of the peoples and living in the areas covered by the trail. It will also serve to encourage and inspire young Cordillerans to be proud of their culture and environs. And promote active work in protecting and enhancing the Cordillera Environment.

The rich biodiversity found around the trails and the traditional sustainable practices of the settlements living around the trails provide rich sources of knowledge for a variety of purposes relating to sustainable development to the utilization of Biodiversity for research, industry, and conservation.

Potential Alternative development paths associated with Trails Development

The development of the trails does not necessarily mean that development will only focus on the eco-tourism. In fact from this type of development several other development paths may arise in line with the trails development framework presented here and are opportunities to re-align local development to conform with the value of the mountain ecosystem and its sustainable use.

Clean Development Mechanism (C-sequestration)

By protecting the areas surrounding the trails and enhancing the local forest ecosystems falls under the category of sink projects for reforestation and afforestation⁸. Thus the protection of the trails and their surrounding areas as a fringe benefit of eco-tourism

⁸ Kyoto Protocol

development also benefits the global environment by increased C-sequestration of the and prevention of further Carbon release from intensified land clearing.

It would be important to note that at present only reforestation and afforestation projects can be classified under CDM, forest protection of existing forest cover is currently not included in the CDM options for the first commitment period of the Kyoto protocol due to the non additive nature of protection forests to C-sequestration relative to its baseline. Although one can argue that by reducing forest destruction you are effectively reducing emissions that would occur if business as usual forest damage would have occurred. This means therefore that there was an actual reduction in emissions arising from deforestation. The main problem I see here is with regards to the quantification of forest protection.

Forest protection may still be included in future commitment periods after the first. Another note on CDM with regards to forestry is that forestry projects credited for Certified Emission Reductions can only amount to 1% of Annex I⁹ countries baseline emissions for each year of the commitment period. Further guidelines are still to be developed to ensure that forestry projects are environmentally sound.

Environmental User Fees and Ecosystem Benefits Charges

Because of the intrinsic nature of the cordillera region being the watershed for most of northern Luzon the protection of areas covered by the trail means that you are in fact putting resources towards enhancing the services that this ecosystem provides for its users both upstream and downstream. Thus once again as a fringe benefit of trails development and its associated protection and enhancement of surrounding areas you are in fact providing a service for the users of these services and therefore will be able to charge for these services.

There are several benefits that arise from the development of the trails:

- Enhanced local ecology

⁹ Ibid

- Decreased siltation of waterways increasing agricultural production and reducing health risks to local communities
- Improved living and health conditions of the communities in the project area due to the enhanced state of the environment
- Downstream users benefiting from enhanced upland ecology –possible collection of user fees (water, irrigation, etc...)
- Biodiversity protection

This reduction in risks and enhanced environment can be quantified and used as a basis for charging user fees for the services that are enhanced by the improvement of the local ecosystem. The fees will augment local economies and serve to bolster the protection and enhancement of the natural environment.

Mixed Sustainable land use

Aside from eco-tourism development a mixed mode of land use can be adopted to take into consideration the different local natural resource management and livelihood practices found in the different villages and settlements spread across the trail. The land use must be in the form which will not degrade the ecological value of the environment that makes it a valuable resource for eco-tourism.

This can include the development of sustainable enterprises such as backyard organic coffee growing, natural farming, traditional methods of agriculture, and the creation of handicrafts for trekkers.

The development of comprehensive local land use plans is important to the success of any such program which would entail mixed uses of the land.

Literature Review

Historical Background of Cordillera Trails

Throughout recorded Cordillera history the trails have appeared in many of the accounts that have been written on the Cordillera region.

Lured by the prize of Igorot gold, the Spanish as early as 1565 heard rumors of the famed riches of the north. The Governor General at the time, Francisco de Sande wrote to the king of Spain in a letter dated June 7, 1576: *"In this island there is much gold among the natives in jewelry, and they trade it... I sent the sergeant major of this camp there with 40 arquebusiers, and he climbed up to them (Gold Mines). He reports that they are located in very rugged country twenty leagues inland, that the road is obscured by crags and thickets, and that the country is very cold and has great pine forests..."*¹⁰

Even before the arrival of the Spanish conquistadores the many major Igorot trade and headhunting routes already existed, Mountain trails interconnected the entire Cordillera region from each Settlement from Ifugao to Benguet, a vast web of paths that linked Villages and people with one another.

Among these were; a trans-cordilleran trade route once existed from Bayombong, Nueva Vizcaya to Bangar Ilocos Sur passing through the towns of Ipituy, Tinok, Buguias, Bakun, Kayan, Tanulong, and Tagudin¹¹. Another of the major trade routes was the trail from Bontoc-Candon passing through Besao and Tirad Pass.



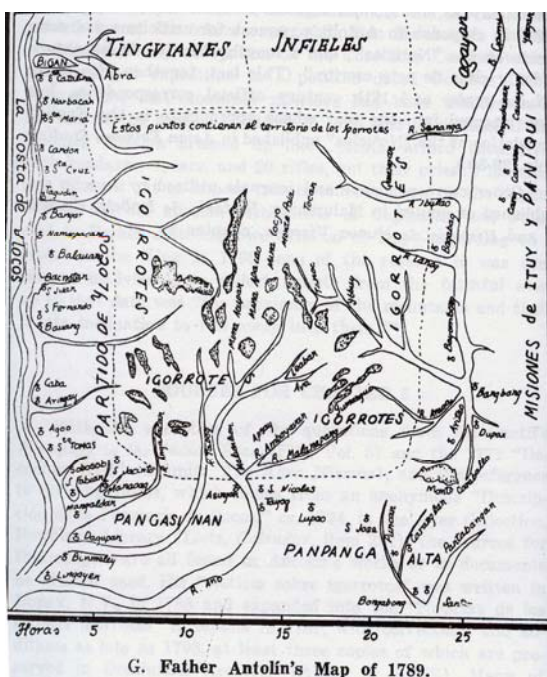
¹⁰ William Henry Scott, The Discovery of the Igorots

¹¹ Fr. Angel Perez *Igorrotes Estudio Geografico Y Etnografico*

Many of the still existing trails today are remnants of the past, some Spanish missionary routes such as that of Villaverde, the trail from Banaue to Tinoc, and many others including those that rise from the plains of Nueva Vizcaya into Banaue, Kiangan in Ifugao, Kayapa and the gold mines of Itogon in Benguet. Other trails are those of the conquistadores as they burned their way through the Cordillera region. One such Conquistador, Galvez, spent 10 years raiding the tobacco planting villages of the Cordillera; on Christmas Eve of

1830 he finished the first ever successful crossing of the Cordillera region from the South China Sea all the way to Magat Valley¹².

Some routes were those of scientists or tourists who traveled in the regions such as those of German Scientist Carl Semper. And in the late 19th and early 20th century the Americans who mounted many expeditions around the then untamed Cordillera Mountains. One such expedition was that of the Wood-Forbes¹³ mission who did a special investigation of the Philippine islands in the early years of the



American occupation.

Recent trail history is confined to the use of the local communities, who still use a majority of these trails to travel from one settlement to another, and in the past 30 years, trekkers who hike through the more popular trails that exist in the region.

¹² Scott, William Henry: The Discovery of the Igorots

¹³ Appendix 1: Wood-Forbes Mission Special Investigation into the Philippine Islands Map



The Philippine Experience with Trail Development

Interest in backpacking and trekking in the Philippines has greatly increased in recent years and has been fast becoming one the main reasons for the exodus to the mountain areas. Modern trails such as those found in the major mountain areas like Mt. Pulag, Mt. Napulawan, and Mt. Amuyao among others have become popular destinations for both local and foreign trekkers.

Although many of the trails that still exist have been opened for trekking these are mostly limited to national parks and there have been no over arching policies to protect the trails which are located outside of the boundaries of the park.

Mt. Pulag National Park



Rising to 2,922 meters above sea level, Mt. Pulag is the highest peak in the island of Luzon and the second highest in the Philippines. The Park covers 11,500 hectares and lies along the Grand Cordillera Central Mountain Ranges, encompassing portions of the provinces of Benguet, Ifugao and Nueva Vizcaya.

The Park has a large diversity of flora and fauna, many of which are endemic to the mountain. Its wildlife includes threatened mammals such as the Philippine Brown Deer, Northern Luzon Giant Cloud Rat and the Luzon Pygmy Fruit Bat.

Mt. Pulag has 4 major trails that lead to its summit; Ambangeg, Akiki, Lusod, and Tawangan. Before climbing the mountain all visitors are required to register at the Protected

Area office located in Ambangeg, Bokod, and Benguet. Several fees are charged upon entry into the protected area as a form of user fee for the use of the park as well as guide fees¹⁴:

- Entrance Fees: P100 for Filipinos and \$15 for Foreigners
- Overnight Camping Fee: P50/ person/ night
- Green Fee: P25
- Guide Fee Depends on the Trail: 1 guide per 7 persons
 - Akiki: P2500 for
 - Ambangeg: P1000
 - Tawangan: P2500
 - Lusod: P2500

Although a large amount of fees are collected each year the main problem for the park management is still funding as the fees that are collected are remitted to the national treasury and often times does not cycle back down to the park management. Often this lack in funding has been detrimental to park management as they can only employ at 1 permanent ranger who has to oversee the entire area of the park. Gaps in monitoring are often filled in by deputized residents who live at the different entry points into Mt. Pulag National park.

In 2005 the park received 3119¹⁵ visitors majority of which passed through the easier Ambangeg trail. The peak season is during the months of October to April with the number of visitors increasing 500% during the long holidays. There is no limit to the number of visitors allowed on the mountain per year and often times during the peak seasons there is much more erosion, trampling, and vegetative damage to the trail and camping grounds.

Trail Maintenance¹⁶ over the past 10 years the trails surrounding Mt. Pulag have had little trail maintenance save some rerouting of certain areas of the trail where it passes through the thorny or overgrown portion of the forest as well as the widening of the trail from Babadak to the Grassland area to accommodate the larger volume of trekkers. The

¹⁴ Local guides are now mandatory when entering the park

¹⁵ Data from Interview conducted with Daisy Moresto: Mt. Pulag Ranger from the Protected area office

¹⁶ Taken from personal visits to Mt. Pulag national park

increased volume of trekkers on the mountain has also resulted in several environmental impacts on the trails and surrounding areas such as trampling, soil compaction, trail widening, laterization¹⁷, and an increase in fecal and solid waste on the mountain.

The lack of manpower as well as political will to enforce the laws within the national park has also resulted in the destruction of some of these trails, one trail in particular is the trail from Tawangan to Lusod which lies inside the National Park, the lack of rangers¹⁸ as well as the lack of support from the local government resulted in a farm to market road being built over the trail. The easier access given by the road has also resulted in the deforestation of the adjacent areas. Within a few months of the roads creation, many swidden farms and commercial vegetable gardens have sprung up in the adjacent forests areas which are now more accessible due to the road access.

Though the creation of the national park is considered a success by many environmentalists, the communities around the park such as; Lusod, Lebbeng, Babadak, and Dango, only see the park as a constriction to their right to use their own land and sacred places. The imposition of no hunting, swidden farming, and wood harvesting has displaced many of the indigenous sources of livelihood that are practiced by these communities. The imposition of these restrictions has resulted in community members hunting illegally or swidden farming in areas of the mountain that normally would not be farmed¹⁹ –this has in effect increased deforestation in certain areas since the community members are no longer able to use the fields and forest areas that they are accustomed to.

Most of the communities surrounding the mountain see the creation of the park and its systems as the disregard for the community norms that govern their use of the mountain environment. The enforcement of no-use zones without the consultation of the community has in fact put more pressure on other areas of the mountain where the community has shifted its livelihood activities, the relegation of Mt. Pulag as a national park has disconnected the

¹⁷ Creation of new parallel trails caused by trekkers avoiding obstacles like mud or water on the trail

¹⁸ Mt. Pulag only has 4 contractual park rangers interview done with Daisy Moresto Mt. Pulag ranger

¹⁹ Interview with Marcus Bilao a guide in Mt. Pulag and a Baranggay official of Lusod

people from the resource and cultural base which they have utilized for centuries relegating the people to jobs as guides for tourists who only come seasonally.

The increased number of visitors in the area has also had socio-cultural impacts on the local Kalanguya and Ibaloi populations living around the mountain. There have been some cultural clashes between the locals and tourists, also among others co-modification, and job level friction between those employed by the national park and the members of the local communities –often those employed by the national park are seen as outsiders who are often excluded from community meetings that involve the use of the natural resources in the area and more often are seen as potential threats to planned development such as swidden farming and road building²⁰.

This limiting of activities has also produced labor in non-damaging forms of use such as guides, porters and personnel for the park yet this employment is quite seasonal and is often inadequate to sustain the needs of individuals and families, thus only a few commonly do this as a full time occupation and more often income is augmented by vegetable and swidden farming.

The treatment of the local population as poachers and encroachers into the protected area as is the norm in most western conservation methodologies and the concept of wilderness wherein wild is nature free of human hands is a concept not shared by the many Calanguya's and Ibalois who live within the boundaries of the National Park whose activities have been curtailed by the establishment of the protected area.

Yet it seems there is a need for a two way dialogue between Indigenous peoples living within the area and those with the experience of sustainable development strategies confronting populations that are introduced into the market economies. It was observed that although the villages living in the interior regions have utilized the resources sustainably the entry into the new economic system for those within access of roads has been the cause for

²⁰ Ibid

the unchecked destruction of forest areas as well as the prevalence of commercial agriculture and its accompanying ills.²¹

Measures such as the creation of the Protected Area Management Board²² were taken to address this problem and some progress has been made but this is still quite far from an ideal situation.

The creation of the national park has been a mixed blessing. For the many trekkers who climb its ridges each year it is an assurance that they will be able to continue doing so well into the future. But for the communities that surround the park, the future is something that is yet a troubling thought as they continue to struggle with the new rules that now govern their mountain home.

Bhutan –carefully managed tourism development²³

Bhutan is located in the eastern Himalayan Mountains. Many Bhutanese live a relatively secure and comfortable subsistence lifestyle that is not, generally, integrated into the modern cash economy. Attractions for tourists are the spectacular mountain scenery and the traditional Buddhist way of life. Since the first tourists were allowed in the country in 1974, the objectives of tourism have been to generate foreign revenue, to publicize the country's cultural traditions to the outside world and help play a role in the country's socio-economic development²⁴.

Recognition of the potential benefits of tourism to Bhutan led to the adoption of a national development plan in 1986²⁵. Two central themes to this plan are the establishment of tourism zones and limiting the number of yearly tourist arrivals, both conceived as means of

²¹ Alipio, JP. Excerpt from Trip Report to the National Geographic Society for the Philippine Central Cordillera Traverse

²² Composed of different sectors: LGU, Community, DENR, PAWB

²³ Appendix 2: Minimum code of travel to upper Mustang and Letter of Guarantee for trekking in Upper Mustang

²⁴ Inskeep, 1994

²⁵ *ibid*

minimizing the potential adverse effects on the country's physical and socio-cultural environments.

Until the mid-1980s, yearly arrivals were kept to a maximum of 2,000, gradually increasing to 5,600 in 1995. Increases in the number of tourist arrivals have only been allowed when the infrastructure is in place to accommodate them²⁶. The numbers and movements of tourists within the country are controlled by requiring that all tourists come on package tours and obtain a visa before arrival²⁷. However, to ensure substantial economic benefits from tourism, the limited numbers of tourists are required to have high daily expenditure. Thus tourism to Bhutan is aimed at those tourists who have a serious interest in, and respect for, the country's culture and environment²⁸.

The establishment of tourism zones in Bhutan based on different geographical areas, each related to different types of tourist attractions and activities, and reflects the government's desire to follow a policy of controlled tourism development²⁹. This is viewed as an important means of conserving and enhancing the environmental and cultural assets of the country. An important element of the plan is the logical staging of development over successive five-year periods and only allowing developments that use traditional architectural designs and materials³⁰.

In the mid-1980s, a tourism-training unit was established under the guidance of the United Nations Development Programme and WTO. This programme teaches the skills that are necessary to run good quality tourist facilities and services, and to manage the highly controlled development. This counteracts the need for importing foreign expertise and helps maximize the benefits to the local population.

"The approach in Bhutan includes the strong involvement of the government and religious leaders in the planning and management process. In this manner the plan

²⁶ *ibid*

²⁷ *ibid*

²⁸ *ibid*

²⁹ *ibid*

³⁰ *ibid*

recommendations reflect government and religious policy, and the plan will receive good support. As should be done in any tourism area, continuous monitoring of tourism is maintained in Bhutan. When problems arise, as they did in 1987, the situation was investigated and remedial measures taken. Thus, tourism can be continuously responsive to local people's concerns while still generating benefits to the country"³¹.

Eco Tourism and its impacts³²

For the purposes of this section I found it necessary to provide the reader with some background information on eco-tourism and its adverse impacts on the environment and on the societies that are its hosts. This in order to in a later part of this document, largely based on observations and data obtained during the expedition, I will be providing several management options that would be relevant to sustainable management in the eco-region.

Tourism has at least 5 major impact areas that need to be addressed in order for an eco-tourism project to become sustainable. These impacts are: Natural Resource Impacts, Pollution, Physical Impacts, and Economic Impacts of Eco-Tourism development.

Natural Resource Impacts

Tourism development can put pressure on natural resources when it increases consumption in areas where resources are already scarce, such as in areas of the Cordillera region where large scale extractive industries have depleted surface and underground resources or polluted natural ecosystems.

Pollution

Tourism can cause the same forms of pollution as any other industry: air emissions, noise, solid waste and littering, releases of sewage, oil and chemicals, even architectural/visual pollution.³³

³¹ Inskeep, 1994

³² Appendix 3: Detailed descriptions of Environmental, Socio-Cultural, Physical, Pollution, and Economic Impacts of Tourism

Physical Impacts

Attractive landscape sites, such as sandy beaches, lakes, riversides, and mountain tops and slopes, are often transitional zones, characterized by species-rich ecosystems. Typical physical impacts include the degradation of such ecosystems. The threats to and pressures on these ecosystems are often severe because such places are very attractive to both tourists and developers.³⁴

Physical impacts are caused not only by tourism-related land clearing and construction, but by continuing tourist activities and long-term changes in local economies and ecologies.

Socio-Cultural Impacts of Tourism Activities

This factor is most often overlooked in tourism development as the large influx of different types of people due to tourism development often results in detrimental changes to a particular society who plays the host for tourist activities.

There are 4 major impacts associated with tourism activities: Change or loss of indigenous identity and values, Culture clashes, Physical influences causing social stress, and Ethical issues.³⁵

Economic Impacts of Tourism

The tourism industry generates substantial economic benefits to both host countries and tourists' home countries. Especially in developing countries, one of the primary motivations for a region to promote itself as a tourism destination is the expected economic improvement.

As with other impacts, this massive economic development brings along both positive and negative consequences.³⁶

³³UNEP, Environmental Impacts of Tourism

³⁴ Ibid

³⁵ Ibid

³⁶ UNEP, Economic Impacts of Tourism

Process/Methodology of trail identification

In order to obtain the data on the location of the trails, we undertook several processes in order to acquire the trail data needed for the creation of a continuous trail across the Central Cordillera Mountain Range

Literature

Prior to the expedition to map out the trails, much research was done in order to obtain relevant information from past literature written on the trails, these were in the form of journals, reports, and books published during the Spanish and American period documenting travels in the region. I was also lucky enough to obtain the autobiography of Mr. Abalos³⁷ whose travels described several the locations of several of the trails in the region.

Although the volume of literature documenting the travels of Spanish Missionaries, European Tourists and American Military Men abound most of these documents only briefly mention the location of the trails, in some cases they are specific to certain towns as in the case of Fr. Angel Perez's *Igorrotes Estudio Geografico Y Etnografico*, although there was a large amount of difficulty in accurately mapping the trails from their accounts based on the fact that they mostly gave general statements such as "the trail from Banaue-Bontoc."³⁸ Although the mention of certain landmarks such as Mt. Polis or Mt. Pulag assisted in the identification of where these trails were located or in some cases formerly located as in the case of Bontoc-Banaue Trail³⁹, it is quite nearly impossible to accurately point out on which ridge, gully, or contour the trail once laid, instead a more general approach was used by determining between which towns the trails once existed and plotting possible areas on a topographic map.

³⁷ An Ibaloi resident of La Trinidad, Benguet, he was also the former Mayor of Trinidad and a school teacher who was assigned in remote areas in the region such as Kabayan, Benguet at the foot of Mt. Pulag. The Autobiography was lent to me courtesy of his grand daughter Gail Abalos

³⁸ Frank Jenista's White Apos

³⁹ Now a road. Some trails were clearly described and mapped such as the Valle Verde trail that leads into Nueva Vizcaya these trails are more often now major roads that connect the region.

Another fact which complicated the mapping of the trails using the literature was the fact that in certain cases they spoke of towns which no longer existed, had changed their names or of town names that existed all across the region⁴⁰.

Most helpful in this process were the many cartographic maps that were found in the National Archives and in the American Historical collection⁴¹ as well as with the literature such as those found in Scott's Discovery of the Igorots⁴² and those found in Harold Conklin's Ifugao Atlas, which although did not give such a clear topographic picture of where the trails were located, they were quite helpful in helping identify old settlements and place names as well as some of the routes that were once used for trade and travel in the region.

Interviews and Field Visits

In order to assist in the process of mapping out the trails in the Central Cordillera region interviews with local residents from the different villages of Benguet, Ifugao, Mountain Province, and Nueva Vizcaya was done prior to the expedition. These interviews were conducted together with field visits to the different villages to also assist in the visual mapping of the trails⁴³.

Personal informal interviews were also conducted with historians and knowledgeable people in the region such as Zenaida Hamada Pawid⁴⁴, Howard Fry⁴⁵, and Roberto Acosta⁴⁶ among others who provided relevant information towards the determination of the specific locations of the different trails as well as their significance.

⁴⁰ it is not uncommon to find a name like Lusod in 5 different places in the Cordillera as names of villages and towns often reflect their geographic location, ecological type, or some significant feature that is not uncommon across the region

⁴¹ Appendix 4: Philippine Maps: 1814 & 1846

⁴² Appendix 5: Maps from Discovery of the Igorots

⁴³ Field visits were only done in approximately 40% of the areas covered by the trail before the expedition

⁴⁴ A local Baguio resident and prominent professional in development work in the Cordillera region and recently one of those included in the 1000 women nominated for the Nobel Peace Prize

⁴⁵ Author of "A History of the Cordillera"

⁴⁶ A Fine Arts Professor from UP Baguio and a experienced trekker in the Cordillera region

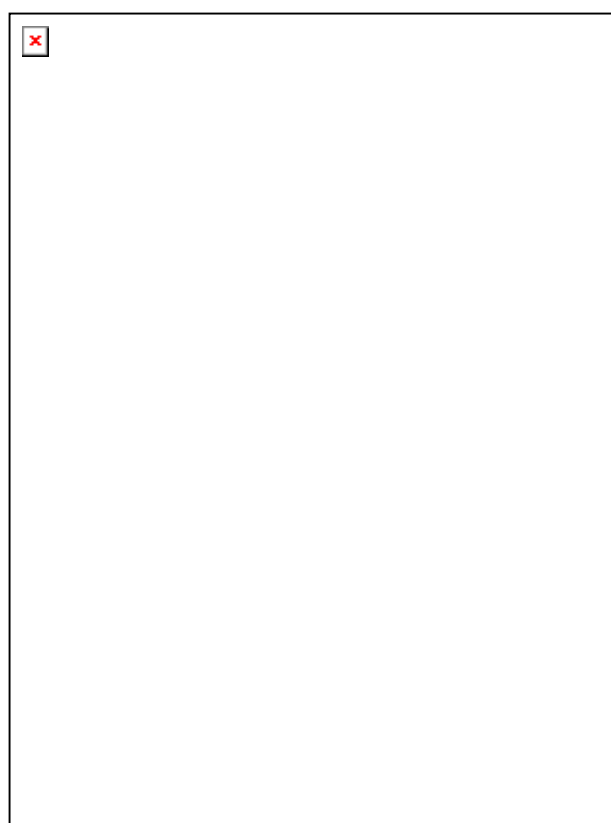
Route Planning

The final preparations done before the expedition to map the trails was to consult topographic maps of the Central Cordillera Region. The relevant data obtained from the Literature, Interviews, and Field Visits together with an analysis of slope profiles based on the contour lines⁴⁷ was consolidated and plotted onto the different topographic maps that covered the entire region to create a map of possible locations for the trails that would connect the region; this data although incomplete provided the template for the trail mapping expedition providing an itinerary that would be followed during the expedition to map out the different trails.

With the volume of data obtained on the different trails throughout the region it became necessary to discard some trails which were not relevant as the main objective of the project was to map out a route that would connect the different trails in the Central Cordillera region.⁴⁸

Some difficulty was also experienced in this process due to the relative inaccuracy and outdated nature⁴⁹ of the topographic maps

available from the NAMRIA⁵⁰.



Ifugao-Mountain Province

⁴⁷ Parallel lines used on topographic maps to show the shape and elevation of the land

⁴⁸ Appendix 6: Philippine Central Cordillera Traverse Itinerary

⁴⁹ Topographic Maps of the Central Cordillera Region. The topographic maps available for Central Cordillera Region from NAMRIA were all dated 1977 and newer surveys had not yet been conducted although the contour lines were still accurate many of the villages and settlements did not represent their actual locations

⁵⁰ National Mapping and Resource Information Authority

Trail Mapping Expedition⁵¹

“We had finished the traverse, retraced the trails that connected the region, Spanish, Japanese, and Importantly the Igorot trails that went through the mountains. Some of the trails had disappeared and turned into roads, some even sprawling 4 lane gashes in the earth yet here we were walking through all of them. We had finished our walk, 38 days, 500++ kilometers, strangely awakening from a dream, we now knew more of our mountain region, our journey at an end we were going home, yet before setting foot on the coastal town of Ilocos Sur the thought had occurred to me, was I not home for the past 38 days... I was.”⁵²

Once the consolidation of the data onto the topographic maps was done and the itinerary for the expedition had been set we were now able to begin with the long tedious task of ground verification and mapping of the different trails that would connect the entire central cordillera region.

The aim of this expedition is to retrace and map out the old trails, “the Cordillera Way”, paths that have linked the region together for centuries. The path will take us through the territory of the different tribes in the region from the Ibaloi, Kankanai in Benguet the trails will take us through the homes of the Kalanguya and Ioac and move on towards the homes of the Ifugao in Ifugao, and the Bontoc of the Mountain Province, connecting the different trails that criss-cross the region’s mountains to create a route that would span the breadth of the entire central cordillera.

The other aim of the expedition was to gather information on natural resource use and socio-cultural practices that would affect the sustainable management of the cordillera eco region. The process was done through interviews with local villagers as well as anecdotal notes from journals that were written during the traverse covering the areas of: Environmental Management, Ecology, Anthropology, and Sociology⁵³.

⁵¹ Appendix 7: Philippine Central Cordillera Traverse Press Release

⁵² JP Alipio, excerpt from Trip Report to the National Geographic Society on the Philippine Central Cordillera Traverse

⁵³ Team Members each had backgrounds in the fields mentioned, team member profiles are found in Appendix 7

Trail Mapping of the different trails was through the use of GPS tracking, which allowed for continuous trail mapping during the course of the trek. Supplemental trail information was added using compass triangulation techniques and visual landmark identification to draw out the trails on the topographic maps.

Additional Cultural Mapping Information: limited cultural mapping was also done mainly by identification of ethnic groups living in the different settlements, interviews and visual observation of the extent of their territories. Each village was marked on the GPS unit and notes were taken as to the ethnic grouping of the villagers living within the area as well as the extent of their farms, livestock pastureland, and swidden areas through interviews. This data though accurate for the villages along the trail is only an approximation of cultural boundaries.⁵⁴

The entire expedition, entirely on foot, took 38 days and covered over 500 kilometers of trails in 5 provinces of the Central Cordillera Mountains.

Results and Discussion:

The expedition was able to map out trails that connected the Central Cordillera Mountains starting from Itogon, Benguet all the way to Gregorio Del Pilar in Ilocos Sur. All in the entire project was able to cover and map a total of 500.993⁵⁵ kilometers of trails and 62 villages and settlements.⁵⁶

The expedition was also able to gather geographic cultural information⁵⁷ for 11 ethnic groups mainly Ibaloi, Kalanguya, Iwac, Ifugao, Ifugao-Mayaoyao, Bontok, Bontok-Barlig, Bontok-Kalingga, Bago, Northern Kankaney, and Ilokano.⁵⁸ This data will prove useful in the later stages of developing management plans for the region in order to contextualize the

⁵⁴ Appendix 8: Cultural Maps of the Different ethnic groups found in the study area

⁵⁵ GPS tracking of distance traveled

⁵⁶ Appendix 9: GPS Data from Philippine Central Cordillera Traverse

⁵⁷ Identification of cultural information was done by expedition team member Reuben Muni who holds a degree in Anthropology from the University of the Philippines and is currently a lecturer at UP Baguio

⁵⁸ Cultural data overlain on topographic maps of the central cordillera region found in Appendix 8

management to take into account the different ethnic groups that reside in the management area.

Anecdotal qualitative data was also gathered with regards to the current state of the natural resources as well as several of the factors that influence the sustainable management of local ecosystems in the region.

Profile of the Central Cordillera Region

Forests:

The Cordillera region has 3 main forest types; Dipterocarp, Benguet Pine, and the Mossy forests. Traditionally these forests have provided for much of the needs of the local populations by supplying them with timber for housing, medicines, and a variety of plant and animal species, these as well as the different ecosystem services that forest lands give to the local population such as moisture retention, landslide prevention, flood and drought prevention, and decreased siltation.

Across the region local resource management of the forest areas depend as much on the type of forest being utilized as well as the location, cultural practices, and livelihood activities of the communities living in the different areas that were covered by the expedition.

In this discussion I will attempt to show that forest sustainability largely depends on the type of forest and its associated utility in as much as the local cultural and economic nuances also affect the pressures on a given forest system.

Pine Forests:

The relative value of a forest depends as much on the dominant flora that is found in the wooded area as with the particular utility that it provides in terms of ecosystem services. In the case of Pine forests they are often considered to have a high direct market value due to the preference for its use as a building material for homes it is also widely used for domestic fuel wood. In contrast the ecosystem utility values for a pine forest are quite low due to the

inherent nature of a pine forest which has a low amount of biodiversity, high soil acidity, low nutrient and moisture content, and is considered as having a lower watershed value than other forest types.

The soil conditions that predominate in the Cordillera Pine forest have deterred most agricultural expansion into the Pine forest areas of the region therefore sparing the forest areas from further degradation due to commercial agricultural expansion and swidden farming; this is largely attributed to the unsuitability of the soil for this purpose. Although the relative ease of access into the forest areas due to the wide spacing between trees as well as the relative scarcity of undergrowth has allowed for greater access for harvesting of firewood and lumber. Given no external sources of large scale natural resource extraction, this ease of access and overharvesting has been the leading cause of deforestation of the Pine forests in areas such as Sadangga and Betwagan, in the Mountain Province and Kayapa in Nueva Vizcaya.

The normally dry and fire prone nature of Pine forests has also been one of the leading causes of deforestation in the region. During the summer months numerous fires often burn in the mountain areas and these are often in the drier and fire prone Pine forests of Benguet and the Mountain Province. During April 2005 the CAR DENR recorded fires in 900 hectares of forest lands⁵⁹, this fact was also verified by the expedition team on the ground from April 1-May 8 in Benguet, Ifugao, Mountain Province, Ilocos Sur, and Nueva Vizcaya. The burning during these months is either due to natural causes, human accidents, or done deliberately to encourage vegetative growth for pasture animals or for forest clearing. Interesting to note here was that large forest fires were only observed in Pine forests and dry brush areas and not in the mossy or deciduous forest areas outside of the swidden farms. The high moisture content of mossy forests deters any fires from starting or spreading.

The yearly burning has in effect deterred the re-growth of forest areas as the naturally low nutrient content of pine soil taken together with the continuous burning of these areas prevents new seedlings from firmly establishing themselves on the mountainsides.

⁵⁹ Baguio Midland Courier, May 15, 2005 p. 20

Mossy Forests:

In contrast to Pine forests, Mossy forests often do not have a very high marketable economic value instead it has a high value for its ecosystem services that it is able to provide such as; soil and water retention, micro-climate control, water quality, water supply and flood protection. These types of forests are often extremely dense, high in biodiversity, moisture content and the soil is often very fertile due to the large amount of detritus that collects on the ground.

The dense nature of these forests, often with a large amount of undergrowth, as well as the low economic value of its timber has been one of the main factors that have dictated the forest's continued sustainability. Other factors such as the high moisture and nutrient content of the soil and the ease of re-colonization of cleared areas has also been a major reason for the continued prevalence of the mossy forest areas found in the greater part of the Cordillera mountains.

The climate and soil characteristics found in mossy forests have provided fertile climate for use in swidden farms and this type of forest area is in fact the preferred swidden area for most Igorot farmers. Its fertile soil and high moisture content provides ample resources for at least 2-3 years of use before moving on to another area, the previous swidden being left to fallow for a number of years.

Often shifting agriculture is blamed for the continued denudation occurring in the remaining forest areas yet it was observed in the areas that have traditionally practiced shifting agriculture that this was quite far from the truth as these communities have practiced shifting agriculture for many years without the denudation of their forest areas.

In the case of the Iwac of Domolpos, it has been over 80 years⁶⁰ since they first settled on the north eastern slopes of Mt. Ugo and to date the many mossy forests in the area are still largely intact.

This is also the case in many of the towns in Ifugao. For over 400 years villages such as Cambulo, Hungduan, Hapao, and others have practiced shifting agriculture and to date the forests surrounding these ancient settlements remain intact. The sustainability of the Ifugao forest is also largely due to the Muyong system that maximizes the forest's soil, water flow, and retention utility that is needed for the rice fields that are the main source of livelihood for the greater portion of Ifugao settlements. These facts as well as volumes of research on shifting cultivation have generated sufficient evidence that its condemnation by government, politicians, or professionals is based on insufficient or erroneous information, or quite simply myth.⁶¹

The main cause of mossy forest destruction is due to the prevalence and spreading of commercial agricultural operations which is often unhampered by climate or irrigation factors due to modern agricultural technology that allows colonization of almost any mountain slope in this region, and more often the preference is for the nutrient rich soil found in mossy forests.

The continued denudation of forest areas being experienced across the region is no more evident than in the province of Benguet where the prevalence of commercial agriculture has spurred an upward movement into the forested areas found in the higher elevations and has produced the countless tracks of vegetable fields that have replaced the once dense forests of the region. Areas such as Mt. Data along the mountain trail on the border of Benguet and the Mountain province and Tinoc on the border of Benguet and Ifugao are both witness to the denudation of mossy forest areas due to commercial agricultural operations. This denudation of forest areas due to agricultural expansion although widespread has been confined to the mossy forest areas and often does not include the pine forests as

⁶⁰ Interview with Lakay Coditio Ioac elder

⁶¹ IWGIA, February 2005 p. 5

these areas are not suited for agricultural use due to the low moisture content, acidic soil, and low nutrient characteristics of Pine forests.

It was also observed during the expedition that even during the drier months the presence of dense mossy forests created a cooler micro-climate⁶² in areas of the mossy forest belt from Benguet to Ifugao.

Dipterocarp Forests

In comparison to the last two types of forests Dipterocarp forests hold the highest economic value for its lumber as well as having also ecosystem and biodiversity values comparable to mossy forest areas.

This high value of forest products has been the leading cause for Dipterocarp forest denudation. The forest's locations at the lower elevations makes access to and transport of harvested lumber much easier thus promoting large scale commercial extraction.

Dipterocarp forest areas are also preferred for swidden farming due to the high nutrient content of the soil and large amount of vegetation to produce Potassium ash, which is the main fertilizing agent derived from the burning in swidden areas. Frontier farming (Swidden or Commercial) has also been one of the leading causes of deforestation in Dipterocarp forests in the region.

This large scale extraction was clearly evident in areas covered by timber agreements such as on the tri-border of Benguet, Nueva Vizcaya, and Pangasinan, on the Borders of Kalinga and Mountain Province and on the borders of Mountain Province, Abra, and Ilocos Sur. These areas were previously covered by mining permits⁶³ (Timber rights) or TLAs as in the cases in Abra and Kalinga.

TLAs in Kalinga Apayao: 74500 hectares in 2002

⁶² Inferred from qualitative observations of areas along the Philippine Central Cordillera Traverse trail

⁶³ Benguet Mines and Philex Mines

Timber Areas⁶⁴:

Benguet: 142,397 he

Mountain Province: 32,230 he

Mt. Province: 38,629 he

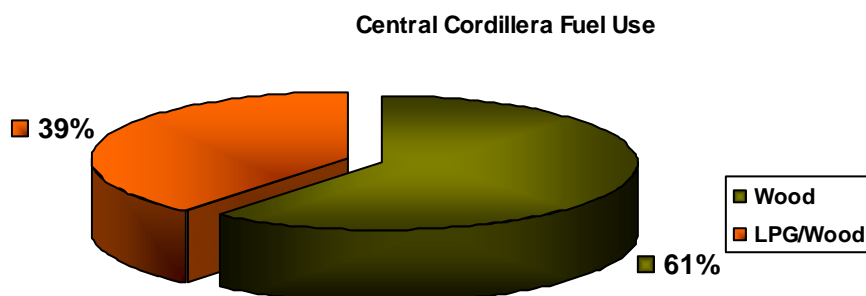
Kalingga Apayao: 247,750 he

Ifugao: 197,902

These factors coupled with economic and cultural factors influence the sustainability of forest regions in the Cordillera Region. Management of these areas should take these factors into consideration when creating management plans for the region.

Fuel Use:

One unifying fact in the different types of forest use exist in the villages that were covered, whether Pine, Dipterocarp, or Mossy it was observed that for a majority of the villages⁶⁵ the primary source of fuel for cooking and other activities was wood from adjacent forest areas.



In the Pine regions the use of pine wood for fuel is preferred due to the resin which makes the pine wood good starting material for burning. The increase in oil prices in recent

⁶⁴ FMB Land Classification by Area, 2002

⁶⁵ Appendix 10: Fuel Use data for Central Cordillera Settlements

years has also prompted the return to the use of less costly fuel wood (even for villages that are accessible to vehicles that deliver LPG and modern fuels) which is readily available from the surrounding forest areas.

Wood is still the fuel of choice for several reasons; wood is cheaper and readily available, preference for food cooked over wood flames, and the use of wood for cooking also serves an additional purpose of maintaining the thatch roofs of traditional homes, preventing the growth of moss and lichen that destroy the roofing material.

Unfortunately the use of fuel wood in most areas is far from efficient and although it was observed that most villages practice selective harvesting of fuel wood (harvesting only the branches of grown trees) the method of cooking is still commonly the open fire method. This is inefficient in terms of fuel use, heat output and often, and as most cooking is done indoors for heat and maintenance of the hut, this practice is one of the main causes of respiratory ailments which are associated with the inhalation of particulate matter from the burning of wood. Surveys in the region have shown that Acute respiratory infection is still the leading cause of morbidity in the Cordillera affecting 61152 people in 2004, and although this cannot be attributed solely to fuel wood burning the mere actuality that wood fuel use is prevalent in most areas in the region as well as the fact that 6 out of the top ten causes of morbidity⁶⁶ in the region can be attributed to inhalation of particulate matter is a cause for great concern.

The progressive deterioration of forest resources in recent years has forced communities to move further from home in search of fuel wood, this is more evident in the Pine Forest areas where tree density and forest moisture is not as high as Dipterocarp and Mossy forests and is prone to annual forest fires that degrade the forest areas and often make it difficult for re-establishment of forest species. The distance individuals have to travel from home for fuel wood has also been one of the causes of another problem, that of peace due to encroachment into adjacent forest areas owned by other villages.

⁶⁶ 1. Acute Respiratory Infection 2. Bronchitis 3. Pneumonia 4. Diarrhea 5. Influenza 6. Hypertension 7. Acute Tonsillopharyngitis 8. Parasitism 9. Asthma 10. Wounds (Source: DOH-CAR 2004)

Several examples can be given across the region:

***Manong Biason** a Calanguya from Sitio Gulgulunan, Baranggay Lusod, Kabayan, Benguet (Located on the Eastern Slopes of Mt. Pulag) has a small separate hut which he uses for cooking the large batches of Camote for consumption of his family as well as for feed for his poultry and livestock of pigs, ducks, and chickens. He also has a small cooking area in his home, which is used for cooking small batches of food and the associated maintenance of the tatch roofing as well as the smoking of meat. In both cases he uses an open fire method where the food being cooked is suspended above the flames. His method of managing the amount of wood being burned is through the constant observation of the burning process, withdrawing and adding wood as needed so that as little wood as possible is wasted.*

***Wedding Feast at Dalic:** Dalic is a town located on the western slopes of Bontoc near Sagada. we were lucky enough to chance upon the wedding preparations for the town of Dalic during the course of our walk. Dalic is a town starved of water, its surrounding fields are parched and hoses criss-cross the landscape trying to suck the little water that the mountain springs from above can provide. Traveling through the trail from the village of Mainit we came upon groups of men carrying large logs that were to be used as fuel for the wedding feast, they had gathered the fuel from forests one to two hours walk from the village, groups of men and even young children took turns hauling the fuel-wood up the mountain to the village. Large piles of wood were already stocked in the home of the groom and each day men from the village would go out to collect more, the energy needs of a single wedding I surmise covered the energy needs of the whole village for a month. The meat (Carabao Meat) was cooked by the men over an open fire while women busied themselves preparing the rice for the celebration, which was cooked over an open flame inside the homes. Wood management is the same as that which was done by Manong Biason wherein wood is withdrawn or added depending on the need for cooking.*

***Betwagan:** the discussion here focuses on a single home whose use of fuel is divided between fuel-wood and the use of LPG Gas. The home is a small home typical of the homes in the*

mountain province made of Pine and Dipterocarp but with aluminum roofing. It would be important to note that throughout the traverse, of those who used fuel wood it was only this home that employed a device designed to efficiently burn fuel wood, a primitive wood stove, which had air intakes, wood-fuel loading areas, as well as an exhaust chimney. They also used a gas stove to augment the lack in wood-fuel available in the area (fuel is sourced 2-3 hours away from the boundary areas of the village), the LPG tank being sourced from Sadangga 2 hours walk away. The use of LPG fuel in this case reduces the families dependence on wood-fuel of which according to the lady of the house she prefers since collecting wood (mostly done by the men) has in the past years become a dangerous activity for those of the village; often having to travel in pairs and carry rifles for safety from the adjacent villages due to the existing tribal war over their villages boundaries. This war has prompted the lady of the house to resort to using LPG even if it is more expensive than wood due to the danger her husband and children are in whenever they go out to gather fuel wood.

As we see in the previous examples the use of fuel wood in the region is dictated by several largely differing factors: primarily by location and access to other forms of fuel, economic reasons which cause the use of wood-fuel instead of other modern fuels, the associated uses of fuel wood such as in the maintenance of thatch roofing and heating of homes, and as in the last case of Betwagan due to the peace situation prompting women to switch to LPG use even with economic and location constraints since it is more costly to lose your sons and husbands than to spend an extra amount for the use of LPG. looking at this question from an economic point of view the loss of labor due to premature death is much more costly than the extra pesos one pays to prevent such incidents, in this case the old adage ‘an ounce of prevention is worth a pound of cure’ applies.

Large community activities such as weddings also increase fuel use, although this will vary with the number of weddings that occur per year as well as the local population present. The extensive use of wood fuel is an important aspect to consider when determining a local environmental management program since it has several notable impacts such as respiratory health, depletion of forest cover, loss of man hours due to extended trips for fuel gathering, and economic impacts associated with the depletion of local wood fuel.

Waters:

Talks of the dam still abound in the region as the construction of the controversial San Roque Dam has caused the loss of the homes of many of the villages downstream as well as damage to the river's natural ecosystem. Several of the immediately observed effects of the large dam are the impediment of travel, spawning, and growth of the local eel or Igat. Impeding its mating spawning and growth cycles, thus in most areas of the Agno River the Igat are no longer found in significant numbers. Nutrients are also trapped by the dam impeding natural soil replenishment downstream as well as serving as a trap for pollutants coming from the mine preventing them from going further downstream but to the detriment of those living upstream which in this case are the Ibaloi –the indigenous people of Itogon.⁶⁷

Large Scale Water Projects

“This place is far from what a home is supposed to be” the words of Gregorio Pitas as he describes the situation their settlement was currently in. Aside from being 6 hours walk away from the nearest road, the town has only a meager supply of water, the population of over a hundred being served only by a single hose of which the water is only a trickle. Not nearly enough for the needs of the entire village. The ground the village stands on is dry and unsuitable for growing most plant life and any that the villagers are able to grow often perish due to the lack of irrigation. The rows of unfinished white houses testament to the promise by the San Roque Dam Management to build their dwellings on this mountain ridge, to date the houses still lack windows, doors and even walls in some cases.

The case of the villagers from Bantik is not new in the villages located along the Agno river valley. The San Roque Dam, (financed largely through a loan with the Japan Bank for International Cooperation) is the third in the series of dams to have been built along the Agno River; the first two Ambuklao and Binga, both upstream of the San Roque Dam. It was originally contested by the people of Itogon due to experiences of those displaced by the

⁶⁷ Day 1: Philippine Central Cordillera Traverse Trip Report to National Geographic Society

previous 2 dams (both taken together displaced more than 300 Ibaloi families). Thus the government at the time decided to build the dam in the next town of San Roque, Pangasinan, the home province of then President Fidel Ramos, providing a solution to the social acceptability issues of the dam's construction. Still the dam was located on the borders of Ibaloi land and as their land was located upstream of the Dam they still bore the brunt of its construction. The dam dislocated 741 families from their homes, farmland and sacred places, approximately 3000 more individuals were displaced from their gold panning sights⁶⁸.

Numerous anti-dam campaigns were launched prior to the building of the dam, yet seemingly taking a blind eye to the people's claims to self determined development the dam pushed on and is now in operation. The indigenous peoples only concession was a promise extracted from policy makers that this would be the last dam to be built in the Cordillera Mountains.

In most resettlement areas the people are often dislocated from their primary resource base, a resource they have learned to utilize efficiently and sustainably over an extended period of time. In most instances they are relocated in environs unfamiliar to the community.

Bantik is no different; their former village was located on the lower banks of the Agno River and the primary source of livelihood for most families was rice farming and gold panning. The resettlement site is situated 4 hours from the river and to get to it –a painstakingly steep climb down the mountain, thus most gold panning activities have been discontinued. The community system of determining where one can pan for gold is also enforced in this area and the river banks below Bantik were already occupied by the community of Tabu and thus in order to pan for gold they must go further downstream to the unclaimed areas.

With regards to rice farming, Bantik is located in the Pine Belt of the mountainside thus soil and climate conditions are no longer suitable for the growing of rice, the lack of irrigation also plays its part in this matter.

⁶⁸ CPA, 2001

This dislocation has also created greater pressure on the natural resources found in the new area as they have little or no knowledge of the utilization of the local resources and often engage in its unsustainable use. In Bantik due to the lack of livelihood and irrigation within the village, majority of the people have resorted to Kaingin or swidden farming on the mountainsides creating the many of the fires that we observed as we walked through the trails surrounding the town.

The lack of livelihood opportunities and access to needed supplies and health care has also spurred an out migration from the settlement area. Notably at the time of our visit majority of the homes were abandoned and of those that were occupied, only the men and a few children chose to stay and try and work the land and build their homes, as the women had gone to the municipality to find jobs to support their families.

Trans-Boundary Pollution

The problem with trans-boundary pollution is an issue that is now slowly facing the different communities in the region. The increased use of pesticides and commercial agricultural inputs has been the cause of concern for many villages, especially the river settlements such as those along the Agno River in Benguet and Chico River in the Mountain Province and Kalingga.

The prevalence of commercial agriculture and increased pollution due to sewage and solid waste has been the cause for concern for many of the villages who are affected by economic activities that are being undertaken upstream.

Tukucan- Tuludan – Wang Wang

The towns of Tukucan, Tuludan, and Wang Wang lie along the Taoang River in Ifugao. Tukucan compared to the 2 latter villages engages in commercial monocropping agriculture of carrots, cabbage, lettuce, and celery and has high inputs of pesticides and chicken dung fertilizer while the two latter towns mainly engage in rice farming and swidden agriculture,

the relative inaccessibility as well as the predominant Ifugao culture has prevented them from entering into commercial agricultural operations.

Recent years has brought about an increase in the pollution due to the agricultural residue from Tukuran and although there have been no studies done to ascertain the water quality the residents from both Tuludan and Wang-Wang have noticed changes in the quality of the Taoang river such as odor, clarity, and even in some cases the reduced production in their rice crops. These changes in the quality of the river system has prompted many community leaders to bring their complaints to the leaders of Tukuran and this has in some ways reduced the loading into the river systems as the people of Tukuran have avoided planting along the river banks and reduced the amount of manure they use on the fields to avoid the leeching into the water systems. In this case the knowledge of the impacts occurring downstream has been the cause for reducing pollution loading in the Taoang River.

On a larger scale the case of Tukuran is replicated in the settlements of Benguet upstream of the Chico River where the vegetable belt of the province is located. These towns use large amounts of chicken dung and pesticides often leeching into the tributaries of the Chico River. Although the effects are still not largely felt in downstream areas of the Mountain Province and Kalingga the intensification of Agricultural activities will eventually cause major pollution in the downstream areas.

The acknowledgement and careful management of trans-boundary pollution of water resources is an important factor that should be considered when implementing any environmental management plans, especially when the pollution is transported from polluted areas to ecologically pristine areas as this will affect the local management and integrity of areas adjacent or contiguous to the source of pollution.

Water Resource Conflicts

The continued degradation of forest resources in the region has exacerbated the continued depletion of fresh water resources in the area for domestic and agricultural use.

This depletion of water resources has put an incredible amount of strain on communities especially in the rice growing areas where water supply and availability is a primary factor in the production and quality of the rice crops.

This depletion of water resources has been one of the primary sources of natural resource conflicts in the region. This conflict is clearly evident in the mountain province area where recent years have seen increased conflicts over natural resources. Often this occurs between villages fighting over a single spring or forest area to provide for the needs that can no longer be provided within the village's territory. This conflict is often between one village with a degraded ecosystem and a village whose ecosystem has remained intact.

Dalic and Fidelisan

The war over water is nowhere more evident than between the towns of Dalic and Fidelisan where a mountain spring located at the top of the mountain dividing the two villages is the water source in contention. The spring in contention is located within the territory of the village of Fidelisan whose primary livelihood is through rice farming and small-scale gold mining. Fidelisan has ample sources of water from different streams, spring, and the Amulsong Creek which is diverted and used for irrigating their rice fields.

Dalic on the other hand suffers from a severe lack of water, both for irrigation and domestic use. This is clearly evident as many of the rice fields are parched from lack of water and young rice plants are found in an unhealthy yellowish state due to the lack of water. Water for domestic use is sourced from a small spring in the middle of one of the rice fields, this small spring supplies the domestic water needs for the entire village of Dalic.

The severe need for water by the village of Dalic has forced them to tap into the spring located above their village on the ridge dividing the 2 villages for the irrigation of their fields. This tapping into the neighboring village's territory has been the main source of tension between the two villages which has resulted in the death of 2 persons, one from each of the villages.

Although hostilities have ceased there is still tension between the 2 villages. Dalic is often at the losing end of the stick as the degraded natural environment and depletion of their local water resources puts them in a disadvantaged position, the people of Fidelisan on the other hand argue that the spring lies on their land and that they have taken good care of their forest resources therefore preventing the degradation of the water recharge capacities of their watersheds, unlike Dalic whose watersheds above their village have been severely degraded.

The conflict between the two villages still continues at the present time.

The example given above is only one of the many conflicts that have erupted in recent years over water. Similar incidents were observed in the towns of Sadangga-proper and Saclit⁶⁹, Betwagan and Lias⁷⁰.

Going as far back as 10 generations of oral history in the mountain province, the primary cause of conflicts have been either killings or theft, yet in the last decade there has been a marked increase in natural resource conflicts on forests, waters, and land in the area⁷¹. This increasing number of natural resource conflicts⁷² underscores the worsening condition and continued degradation occurring in the mountain environment.

Conflicts are now no longer isolated between villages this has extended to include intra-village conflicts between village mates. In Betwagan and in many other areas in the mountain province villagers have resorted to guarding their rice paddies to ensure the adequate water supply for each paddy, this is done 24 hours a day and shifts are usually between family members, during the dry months even children as young as 7 are sent out to the paddies to ensure no one diverts the precious water from their rice plants. Many local conflicts have arisen from this lack of water. Although the larger conflict between Betwagan

⁶⁹ Conflict is over watershed areas

⁷⁰ Conflict over forest areas and hunting grounds

⁷¹ June Prill-Brett, Pechen: the Bontok Peace Pact institution, Table 2, pp. 46-51

⁷² often between villages with degraded and pristine ecosystems

and Botbot has reduced the internal conflicts within the village as more energy is focused towards village level protection from Botbot.

The degradation of watersheds and water resources as well as the continued effects of increased economic pressure on the environment has forced many villages into conflicts over this most precious resource, water.

Migration:

As a factor affecting the ecosystems integrity migration in the different villages along the trail plays its own role in the conservation of local ecosystems. It was noted that in the areas covered by the expedition wherein there was a large percentage of out-migration as in the cases of Barlig and Besao the local ecosystems have remained relatively intact and pressure on these ecosystems was observed to be much less than their counterparts, whose local ecosystems were degraded, which had very little emigration as in the cases of Tinoc and Sadangga. Table 1 below shows the NSO data from 1999 on local emigration rates.

Table 1: Migration Rates

Percentage of Population Migration within the province		Migration to other areas outside of the province
Barlig	15.1%	4%
Besao	16.4%	9.2%
Sadangga	7.8%	5.3%
Tinoc	4.16%	No data

Resident Population: June 1999

Barlig: 7477

Besao: 9147

Sadanga: 8373

Tinoc March 1996: 8256

Although there are other factors also affecting the use of the natural resources and further studies must be made to verify the qualitative observation done during the expedition it would be important to note the large disparity in the amount of emigration between the different municipalities. More importantly it was observed that in the areas with high

emigration rates, such as Besao and Barlig, even with relatively similar resident populations to the other Municipalities, have healthier ecosystems (larger forest cover, more and constant water supply and a better microclimate) than those whose emigration rates were low.

This healthy ecosystem may be attributed to the inflow of revenue from the emigrant populations supplementing local income and preventing greater economic pressure on the local ecosystem.

Increased dependence on remittances from migrants and employed children. Loss of usufructuary rights leads to decline in subsistence production and substitution of store bought goods for home produced. This shift from home produced to store bought goods shifts pressure away from local resources but this also introduces new forms of pressures in the form of pollution from market based goods.

Another look at migration in the Cordillera region

The people of the Cordillera have been on a constant move as reported by the accounts of Spanish friars who had dared to venture into the area in the name of Christianity, Reports of inter-village armed conflicts, head-taking raids of neighboring as well as lowland villages and trade with the people of the Ilocos coast suggest that the region's early peoples, though not nomadic, were not confined to the boundaries of their mountain villages. These movements, however, do not entail migration. Rather, these serve as the precursors of the inherent curiosity and adventure-seeking character of the Igorots.

One of the most famous stories that began as an adventurous quest was the participation of several dozens of Igorots into the St. Louis Fair of 1904. Their participation to the World's Fair was not really a case of exploitation of them by the Americans as some had suggested for us to believe. Rather, it was the result of the inherent curiosity and sense for adventure to see the world beyond their villages that led these Igorots to go on a Trans-Pacific, trans-American and later on, trans-European tours of a lifetime. They say that these Igorots were the first Cordilleran Overseas Filipino Workers (OFWs) and some who did not

return to their villages after the American and European exhibitions were the first Cordillera migrants on an international level.

The return of these *nikimalika*⁷³ Igorots, the influx of American gold prospectors and the building of the Kennon Road which involved different nationalities, among them Chinese, Japanese, and Indians, paved the way for the widening of the cultural horizons of the people of Cordillera.

As years passed by and people from the lowlands, particularly Pangasinan and the Ilocos, migrated to the Cordillera, especially in Baguio City and La Trinidad, predominantly due to economic reasons, many people of the Cordillera did the same thing. They migrated to the lowlands and other countries.

This migration of the Cordillera people is not only true on the inter-regional and international level. Internal migration is also happening in the Cordilleras. An example of this is the stepwise, upland-to-upland migration pattern of the people of Ifugao, particularly those residing along the slopes of Mt. Pulag, into the Benguet area. This migration is partly due to the increasing commercial vegetable production in that area. What was originally found in the Benguet-Mt. Province boundary towns of Buguias and Bauko respectively is now fast encroaching on the Benguet-Ifugao boundary towns of Kabayan and Tinoc⁷⁴.

One way to look at this phenomenon is the economic improvement of the Benguet and Ifugao vegetable framers who are now able to send their children to college because of a steady income. However, this also poses a threat to the environment since the land that they are clearing for new vegetable farms are mossy forests that are a vital part of Mt. Pulag's diverse ecosystems.

The Team is a witness to this conversion of mossy forests into vegetable farms and farm-to-market roads. What does this mean? This means that there is in fact a connection

⁷³ "from America or those who went to America"

⁷⁴ Taken from interviews with Baranggay officials of Tucukan, Tinoc, Ifugao

between migration and environmental degradation. Many of the commercial vegetable farmers in the Kabayan side of Mt. Pulag are migrants from the neighboring town of Tinoc, Ifugao and that they are posing a significant threat to the environment because of their farming activities⁷⁵.

There is a basis for this threat since what is now considered as the vegetable basket of the Cordillera, the towns of Buguias and Bauko are also located on the slopes of Mt. Data, the source of four major river systems in Luzon⁷⁶ is now occupied by layers and rows of vegetable crops.

Inter-regional and international levels of migration of the Cordillera people: Like many Filipinos, the people of the Cordillera were not spared from the prospect of earning twice or thrice from what they are earning in their villages through farming and handicrafts. Many went to the lowlands, particularly the urban areas like Metro Manila, and to other countries like the Middle East, Hong Kong, Japan and Singapore to be wage earners.

At first glance, there seems to be very little connection to this semi-permanent or temporary migration of the people of the Cordillera as wage earners in Metro Manila and overseas. Many of these wage earners are now able to enjoy the luxuries and use amenities that they could not have done had they stayed in their villages. They are now able to experience the pros and cons of city life.

This means that there is a shift from the traditional, conservative worldview of these people into a more liberal, capitalist orientation. The village that they now know is not just Tokuan or Fidelisan. Rather, they now consider themselves as part of the “global village,” most of its members spend their free time (and money) on a Mc Donald’s or Starbucks outlet on some shopping mall. They also now see the value of giving their children a quality college education as a means of enabling them to secure a better future. In turn, their children, who are now college educated, follow their parents’ footsteps and tend to look for work in the

⁷⁵ Philippine Daily Inquirer, August 29, 2004

⁷⁶ Agno, Cagayan, Chico and Magat

urban areas and abroad. Some even refuse to go back to their original villages because they believe that they are not fit for the rural lifestyle. Thus, not only migration in a physical sense happens but also the migration of the social self in terms of worldview and ideology.

What are then the results/effects of the physical and social migration of the people of Cordillera? First, the physical separation from their villages' natural environment means a loss of contact with the intricacies of nature. Second, the loss of contact with the intricacies of nature leads to the lack of people who have an intimate knowledge of their environment, which in turn leads to the loss of traditional/local knowledge on natural resource management.

With the change of worldview and ideology, migrants have the tendency to look at some of their practices in the village as unscientific or unproductive. Because of this, there is also the tendency of a shift from traditional, "unscientific," subsistence-based production into a cash-crop economy-oriented, monoculture production such as commercial vegetable farming or into a service-oriented economy like tourism. Worse, the complete disregard of farm work as a means of livelihood and complete dependence on wage labor as their sole source of income may result from a shift to a global capitalist mode of thinking of these migrant workers.

The outward-looking worldview of these migrant workers, whose day-to-day affairs are now located outside and far from their original villages, driven by the desire to earn more money so as not to go back to the farm and be involved in hard manual labor poses important questions to us. Who will be the future bearers of local knowledge about the environment? Who will have the desire to protect and preserve the environment? Who will directly benefit from the protection and preservation of this environment? These are questions that are very difficult to answer when the one being asked sees the prospect of a brighter future on a foreign land as a nurse, a computer engineer or an oil driller⁷⁷.

⁷⁷ Expedition Trip report to NGS: Reuben Muni

Women:

The UNDP Human Development Report of 1995 sent out this following statement: Human development, if not engendered, is endangered. Women play a crucial role in development for they are as much part of the community as men are. In the Cordillera region the role of women is no less important, as they are involved in community activities from simple household chores all the way to the management of natural resources and in some cases are the promoters of peace. Throughout the expedition there have been several noted examples of women's roles in community development.

Betwagan: Sabina Lumatac:

Betwagan is situated between Tinglayan, Kalingga Province and Barlig, Mountain Province. For more than twenty years now, it has faced an inter-village armed conflict with Tinglayan. It has also had a history of conflict with Sitio Lingoy, Barlig but its conflict with Sitio Botbot, Tinglayan is much more recent. The conflict is over water resources and hunting grounds. Five men have died because of the said conflict.

Of these five men, two were from the family of Sabina. One was her brother, the father of her nephews, and the other one was his cousin, who died while trying to take revenge for his cousin's life. In the 1990s, there were other men who died because Betwagan's armed conflict with other Tinglayan barangays. This provoked the women to organize peace talks. Although the conflict didn't stop, the talks were able to ease some tensions.

Now the conflict has escalated to an armed battle and it is not uncommon to see people even young adults walking around the village carrying automatic rifles.

The loss of her brother and cousin has made Sabina quite weary of the conflict. She has also been left to care for her brother's children, the eldest of which –Mark goes to the fields carrying an M-16 rifle. The threat posed by the conflict has forced her to restrict the travel of her husband and the rest of the men of the house including mark. She has also instituted the

use of LPG, even if this entails a long trek into town, for cooking instead of wood to prevent prolonged treks into the forests to collect firewood.

Sabina shares this weariness of conflict with several other women of the community and they have all been starting their own little initiatives to influence their husbands and other community leaders to start the process of ending the conflict.

The example above shows the role of women in the promotion of peace in the community, as the effects of conflicts are not only emotional but are also economic in that conflicts limit the use of some natural resources as well as the extent of travel that members of the community can engage in, the loss of life also means a loss in the labor force, and in the case of women the loss of a husband will mean the loss of a contributor to household finances and as such measures are often taken to safeguard against any such loss.

It was observed in most cases that aside from maintaining the household and caring for the young, women also take on some of the tasks in producing food for the family such as maintaining the swidden and engaging in market based economic activities. This is the case in many parts of the region where women are expected to carry a double burden of both reproductive and productive tasks. It was observed in many of the settlements covered by the expedition that they not only take care of their children but they also look after their swidden farms while their husbands go to the town centers for work. Some make souvenir items and trade them in the nearest marketplace.

Men in the swiddens is a rare sight, fields are often cared for by the women, while the clearing of the fields is often the job of the men. This arrangement is not rigid and often times it happens that the gender roles are interchangeable based on the current needs and availability to do the labor.

Differences in time budgets between men and women as in the case of women carrying a double or triple burden of work (household, farm, market), means that women more often have less time to care for themselves and with the advent of modern

industrialization and modernization unpaid housework becomes increasingly isolated and spatially separated from paid productive work outside the home.

The greater number of responsibilities of women also means that they have a much greater role in decision making when it comes to the utilization of natural resources especially those which relate to their immediate tasks such as the gathering of water, firewood and farm/swidden management. Wherein the degradation of natural resources will mean an added burden for the women utilizing the resource e.g. traveling further to collect fuel wood and water, depletion of soil resources making the maintenance of farms much more intensive, etc...

Women control most of the non-money economy through bearing and raising children, and providing much of the labor for household maintenance and subsistence agriculture women have two jobs in the home and outside of it⁷⁸.

A new impoverishment of women has been brought about by the absorption into the market economy of much of the natural resources of land, water and timber on which family subsistence depended, without offering women a new means of support⁷⁹. The responsibility for maintaining the family by providing food, water and firewood makes women very aware of environmental degradation and determined to do something about it.

Fertility Rates and the Family

Fertility rates are related to levels of development, although it would be wrong to assume that large families are always considered negatively by women e.g. Battad old women with no children to take care of them in their old age are often left with very little in terms of economic opportunities due to their age and status of being without children. In the region it is not uncommon to see families with more than 5 children. Children in this case are considered an asset as additions to the labor force and looking towards the future are also

⁷⁸ Momsen, Janet Henshall (1991) *Women and Development in the Third World*

⁷⁹ Ibid

considered as those who will care for their parents when they age, thus a premium is placed on having many children.

Large families are often seen as an opportunity cost for women limiting life choices⁸⁰. Women's participation in the productive labor force will inevitably be affected by the time and energy burden of their reproductive tasks yet interviews done with women in the region indicate that this is not the case since many of the tasks for caring for the young are also given to the other children.

Children are often given a greater responsibility at an earlier age, duties such as wood collection, cleaning, caring for the young, and even cooking are given to children at a very early age. It is not uncommon to see children as young as 7 caring for their younger siblings while their parents are out in the fields.

Thus in the case of most Cordillera women the burden of reproductive tasks is somewhat lessened by the contribution of other members of the family, in some cases gender roles regarding reproductive tasks of caring for the young are also taken on by the husbands, this is often dictated by the current needs and situations confronting a family unit e.g. a woman going to the city to work since she is the more educated and therefore has greater opportunities for work than the man, thus reproductive tasks become the man's responsibility.

⁸⁰ Ibid

Recommendations:

Ecological and Cultural Area Based Management

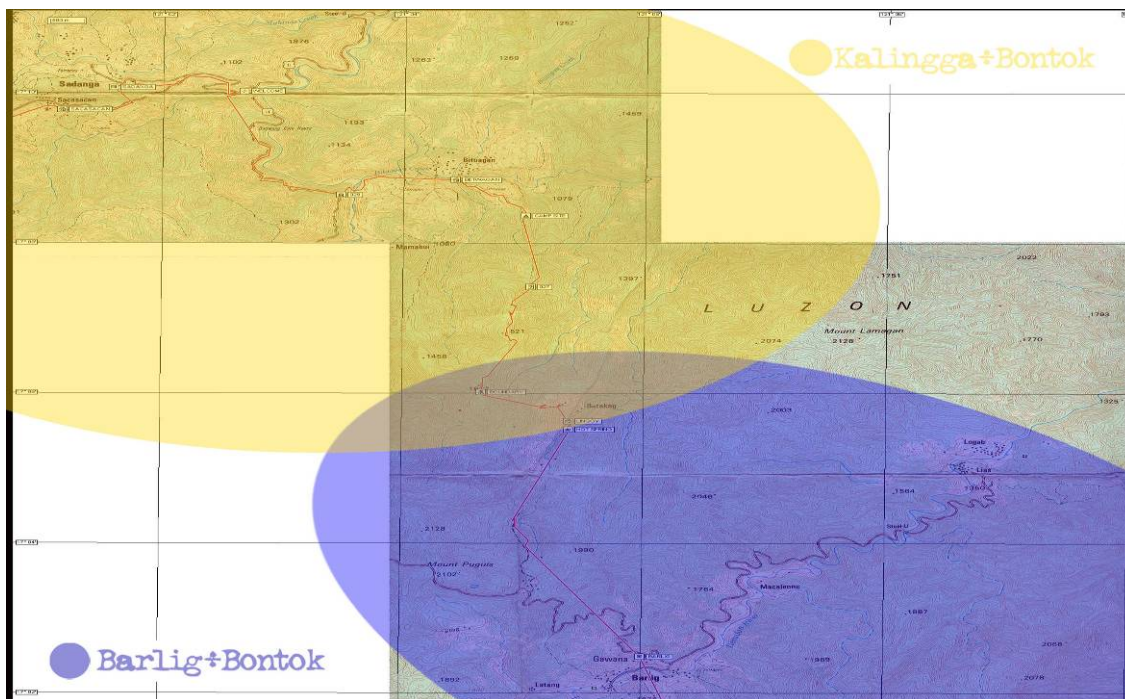
The large variety of ecosystems and ethnic groups living within the proposed management area makes the creation of a top down management plan unsuited to the many distinct local resource regimes and ecosystems. The presence of varied ethnic groups means that cultural practices and norms differ from one village to the next thus management strategies that apply to one area may not apply to next valley due to differing norms and local ecology.

I would like to clarify though that this system differs from community based management strategies in that one must also take the ecosystem into account when determining the management area thus management systems may overlap with other villages or in the cases where community areas cover more than one ecosystem than several different management strategies may be employed. Ecosystem knowledge must also be shared between communities as well as a need for information sharing between those with experience with modern sustainable development strategies and the communities who utilize the resource.

Management in this case will be based on cultural and ecological areas and strategies will be developed to take cultural norms and practices as well as ecosystem values into consideration. The concept is similar to the concept of cultural landscapes, which brings together people, plants, animals, and places into one system therefore creating holistic view of the resource systems in the area of management.

The map below shows an example of this type of management. The Blue area is occupied by the Bontok-Barlig Ethnolinguistic group while the orange area is occupied by the Bontok-Kalingga ethnic group. The blue area is predominantly composed of mossy forests while the orange area is composed of Pine forests.

Resource use in the two areas largely differs as in the blue area the forests are largely intact while in the orange area the forests are quite thin and towards the town center of Betwagan have become grassland pastures. There are also cultural practices within the two villages that prevent inter-village travel and the entry of outsiders during certain times of the year as well as local protocols on the entry of visitors are often more stringent than other areas in the cordillera region.



Thus in terms of trail development for tourism consideration of local practices are important in order to prevent local level friction between tourists and local residents to ensure the sustainable use of the resource.

The type of ecosystem being utilized will also dictate its sustainable use since there are certain ecosystems that are more vulnerable than others as well as different ecosystems requiring different modes of management in order for use to be sustainable.

E.g. the type of forest dictates its sustainability: Pine forests are more open to denudation due to their nature of being open, providing for easy harvesting, and prone to fires thus special management is necessary to ensure sustainability this management must include cultural norms in terms of modes of forest use.

The implementation of a cultural and ecological area management strategy will also help in the management of trans-boundary pollution as compared to simple community based management strategies which only take into consideration the immediate geographic area of the community, this system takes into consideration entire ecosystems into the management strategies.

This inclusion of whole ecosystems into management areas provides a more holistic approach to natural resource management and due to its scope will also include the management of trans-boundary pollution. The added inclusion of culturally delineated knowledge and management strategies also ensures that local resource users still have primary management of their resources and that place based values and meanings of landscapes that are specific for local resource use are translated into the larger ecological management area. The inclusion of modern strategies will help local users cope with the constantly changing nature of natural resource use due to economic, climate, and ecological factors.

There are several things that must be considered when delineating and implementing an Ecological and Cultural area based management strategy:

1. Local Ecosystem Profile
2. Ethnic Groups present
3. Types of Local Livelihoods
4. Cultural Norms and practices
5. Natural Resource Management practices
6. Economic situation of the local population

These aspects taken together form the core of cultural and ecological area management.

Fuel Use Efficiency Development

In terms of fuel use the main problem remains that the methods employed in the use of fuel wood in cooking are largely thermally and environmentally inefficient and as such create drudgery and problems for the users. The large percentage of fuel-wood users in the region makes this aspect one of the primary trusts when considering programs for forest management, the development of improved wood stove technology would greatly benefit any forest conservation programs to be implemented in the region.

There are several benefits which can be obtained from Improved Cookstove Programs (ICPs):

- Reducing the impact of fuel gathering on local forests –the improvement in efficiency of wood-burning stoves saves fuel through improved heat output and reduction in heat loss which is largely the case in the current open fire methods of cooking. Although it is accepted as well that the introduction of ICPs may not have such a significant impact on arresting environmental degradation it still has a significant impact on local resources made available to communities
- Reduction in CO₂ and other emissions –the inefficient methods currently being utilized in the region in the use of fuel wood promotes inadequate combustion as well as inefficient use of wood resources thus creating particulate and and CO₂ emissions that affect local health and global climate. The introduction of ICPs may reduce local health impacts by creating less smoke and particulates that are the cause for many health problems that may arise from indoor cooking. The more efficient combustion also significantly reduces the amount of fuel wood needed thus reducing CO₂ emissions into the atmosphere

- Saving of fuels and, directly or indirectly, saving of time due to the stoves' higher thermal efficiency. Cooking can often be done faster while the saving of fuel implies that less time is required to acquire it and/or money spent to purchase it⁸¹.
- The entry of tourists into an area may also increase the pressure on local resources such as wood and water, thus in the cases of tourists certain policies may be instituted such as requiring the use of camping stoves whose fuel is sourced from outside the management area to prevent increased pressure on wood fuel during peak tourist months.

In the study area a significant number of man hours (men, women, and children) are spent in the collection of fuel wood from surrounding forests, this collection is often extended when forest areas near the community are degraded therefore wood gatherers have to travel 2-3 hours each day from the village in order to collect the needed firewood. With the use of an ICP, this period can be substantially reduced and the time saved can be used productively for other purposes.

Integration of Women in Decision Making and Project Development

Women play a crucial role in development and their position in the community as the household keepers and primary users of some natural resources such as water and wood put them in one of the prime positions in crafting an environmental management system and ensuring that it is implemented at the local community levels⁸².

The integration of women's perspectives in project development ensures that the gender based knowledge on natural resource use, consumption patterns, and cultural norms governing gender roles are taken into consideration when implementing a development program.

⁸¹ Improved Solid Biomass Burning Cookstoves: A Development Manual, 1993

⁸² Momsen, Janet Henshall (1991) Women and Development in the Third World

In terms of looking at developing the trails for eco-cultural tourism the large influx of foreign tourists and their accompanying culture may be detrimental to local values and gender roles that more often do not conform to the modern ways of thinking. Therefore promoting independence for women may not conform to local situations and may prove more damaging than allowing local processes to take place. Integration of these local nuances will ensure that the local needs are met while still conforming to the needs of the larger needs within the ecological and cultural system.

Conflict Management through Improvement of local Ecosystems

In nearly all the inter-village conflicts encountered, most of them were natural resource conflicts between an area with degraded ecosystems seeking additional resources and a village with a conserved ecosystem wanting to protect the resource that it has worked to conserve. As in the case of Dalic and Fidelisan, where the Dalic is the community with the degraded resource (water and forests) while Fidelisan has an ecosystem in good condition. The Disadvantaged community is often the first to initiate the use of the resource, often perceived as open access, prompting the other village where the resource is located within their boundaries to seek grievances for the unauthorized use of the resource found within their borders.

The continued degradation of the environment in the mountain region will mean that this trend of environmental conflict will continue to increase, in the areas of the mountain province where degradation has meant the destruction of local livelihoods such as loss of hunting grounds, degradation of soil preventing agricultural use, loss of watersheds creating water shortages. These factors force communities to seek resources outside of their boundaries creating the seeds for natural resource conflicts.

A strategy for addressing this problem is to institute local environmental improvement programs that are geared to address the need of the community for a type of resource.

E.g. increasing forest cover through delineation of no-use areas and promoting assisted natural re-growth and muyong systems to increase watershed capacity, stream flow, and protection of forests around springs and sources of water to promote greater periodic water supply.

Ensuring that communities have a local environment in good working order and capable of sustaining the local needs is of prime importance on the road towards peace and the prevention of further conflict between villages. Simple a solution as it may be environmental degradation is often overlooked in conflict management systems as the substantive aspect that is the primary cause of the conflict and no measures are done to mitigate or prevent it from occurring.

Promoting alternative sustainable development strategies such as the creation of an eco-cultural trail may help improve the local environmental situation as well as promote peace through enhancement of natural ecological areas that become assets for eco-cultural tourism development.

Prevention of Adverse Impacts from Tourist Activities

Although tourism brings in added revenue to support the local economy it also has with it several significant impacts which affect both the environment and socio-cultural landscapes that are involved in the tourist activity. Below is a matrix of possible impacts and the measures that can be taken to mitigate the impacts on local systems.

Impact Type	Mitigating Measures
Water resources	Limiting yearly tourist arrivals and high daily expenditure requirements for tourists to minimize impacts on local resources Trekker density will be based on the available supply of water per eco-cultural area
Local Resources	Implementation of self contained expeditions for trekkers who want to walk the trails so as to avoid creating a demand for local resources

Land degradation	<p>Implementation of self contained expeditions for trekkers who want to walk the trails so as to avoid creating a demand for local resources.</p> <p>Trekkers will also be required to bring and use their own tents to prevent greater pressure on local resources for use in the building of inn's and cabins</p>
Air Pollution and Noise	<p>Using guided tours instead of individual tourist arrivals so that vehicle use is centralized through the trekking agencies to prevent individual vehicle influx</p> <p>Some noise regulations may be implemented stringency of noise regulations may depend on local needs by the different villages</p>
Solid Waste and Littering	<p>Avoidance of potential trash items/waste prevention and source reduction/ waste avoidance of type of products to be brought by the trekkers into the trail management area</p> <p>Implementation of leave no trace trekking and IEC programs to promote proper solid waste management in the different villages along the trails.</p>
Sewage	Limiting tourist influx based on local ecological capacities and village capacities
Aesthetic Pollution	<p>Integration of structures with natural features and cultural designs to prevent aesthetic pollution</p> <p>Trekkers will be required to use tents whenever possible to dissuade the construction of inn's and huts</p>
Construction Activities and Infrastructure Development	<p>Limiting yearly tourist arrivals to prevent greater need for roads and infrastructure development.</p> <p>High daily expenditure for tourists to support local economies and prevent uncontrolled development to satisfy tourist demands through regulation</p>
Deforestation and intensified or unsustainable use of land	<p>Limiting tourist arrivals and promotion of a mixed mode of land use incorporating sustainable land use strategies to prevent environmental degradation</p> <p>Comprehensive sustainable land use planning for the areas that are covered by the trail</p>
Trampling	<p>Limiting of tourist arrivals, closing down of certain trails during certain times of the year to promote natural regeneration</p> <p>Clear trail signs to prevent trekkers from going off trail and trampling areas outside the trail</p> <p>Trail use frequency management to prevent</p>

	trampling of trails and other related areas such as campsites and settlements
Alteration of ecosystems by tourist activities	<p>Leave no trace training and implementation for local officials, guides, and rangers as well as trekkers who will be using the trail</p> <p>Limiting yearly tourist influx and implementing proper distribution throughout the year so that tourist activity will not be focused on a single season</p>
Commodification	<p>Local community regulations to prevent the commodification of rites, rituals, festivals and practices to conform to tourist demands</p> <p>Training for local community leaders, guides, and trekking agencies on the socio-cultural impacts of tourism</p>
Standardization	<p>The use of cultural and ecological area management should take into consideration the intrinsic differences between cultures and environs and should have mechanisms and policies to prevent the standardization of the trekking destinations</p> <p>Focus is on developing the diversity of cultures and ecosystems (as locally determined) in the region rather than conforming to tourist demands</p> <p>Training for local community leaders, guides, and trekking agencies on the socio-cultural impacts of tourism</p>
Loss of authenticity and staged authenticity	<p>Local community regulations to prevent the commodification of rites, rituals, festivals and practices to conform to tourist demands</p> <p>Training for local community leaders, guides, and trekking agencies on the socio-cultural impacts of tourism</p>
Adaptation to tourist demands	<p>Training for local community leaders, guides, and trekking agencies on the socio-cultural impacts of tourism</p> <p>Local community regulations to prevent the commodification of rites, rituals, festivals and</p>

	practices to conform to tourist demands
Culture clashes	<p>Training and IEC for local community leaders, guides, and trekking agencies on the socio-cultural and environmental impacts of tourism</p> <p>Code of travel for trekkers that prevents the imposition of foreign values on local communities⁸³</p> <p>Limiting tourist arrivals per year</p>
Economic inequality	<p>Training and IEC for local community leaders, guides, and trekking agencies on the socio-cultural and environmental impacts of tourism</p> <p>Code of ethics of travel for trekkers that prevents the imposition of foreign values on local communities⁸⁴</p>
Irritation due to tourist behavior	<p>Training and IEC for local community leaders, guides, and trekking agencies on the socio-cultural and environmental impacts of tourism</p> <p>Code of travel for trekkers that prevents the imposition of foreign values on local communities⁸⁵</p>
Job level friction	Regulations to make sure that the local community is given priority access and training for jobs relating to the trekking industry
Resource use conflicts	<p>Self-contained expeditions to prevent local resource conflicts between tourists and the local population</p> <p>Leave no trace ethics to be implemented by the trekkers</p>
Cultural Deterioration	<p>Training and IEC for local community leaders, guides, and trekking agencies on the socio-cultural and environmental impacts of tourism</p> <p>Code of travel for trekkers that prevents the imposition of foreign values on local communities⁸⁶</p>
Conflicts with traditional land-uses	<p>Tourism is implemented only as an added source of livelihood</p> <p>Mixed sustainable land use should be implemented to prevent dependence on tourist activity and conflicts with tourist land uses</p> <p>Community land use regimes should be considered first before implementing any tourist</p>

⁸³ See appendix 2: Minimum impact code for travel to Upper Mustang

⁸⁴ Ibid

⁸⁵ Ibid

⁸⁶ Ibid

	<p>land use programs</p> <p>Self contained expeditions for minimum impact travel</p>
Crime generation	<p>Training and IEC for local community leaders, guides, and trekking agencies on the socio-cultural and environmental impacts of tourism</p> <p>Implementation of local mechanisms of crime prevention and management</p>
Child labor	<p>Regulations preventing child labor based on community determined age-responsibilities for children as the age by which children are given a greater responsibility differs between ethnic groups and villages</p>
Prostitution and sex tourism	<p>Training and IEC for local community leaders, guides, and trekking agencies on the socio-cultural and environmental impacts of tourism</p> <p>Minimum impact code of travel for tourists including ethical considerations⁸⁷</p> <p>Regulations and strict sanctions to prevent solicitation and prostitution based on local community practices and sanctions</p>
Export leakage	<p>No large development projects within the trails management area to prevent export leakage from big developers</p> <p>Profit sharing of revenue with host communities</p> <p>High daily expenditure for tourists with 60-30-10 sharing between the local communities (60), trekking agency (30) and the national government (10) of which at least 20% of community revenue goes to protection, maintenance, and improvement of the trail areas</p>
Import leakage	<p>Regulations implementing the use of only locally available materials to prevent conforming to tourist demands providing export leakages of tourist revenue</p> <p>Profit sharing of revenue with host communities</p> <p>High daily expenditure for tourists with 60-30-10 sharing between the local communities (60), trekking agency (30) and the national government (10) of which at least 20% of community revenue goes to protection, maintenance, and improvement of the trail areas</p>
Increase in prices	<p>Regulations to prevent the increase in land</p>

⁸⁷ See appendix 2: Minimum impact code for travel to Upper Mustang

	<p>values, local goods and services, building costs and other costs</p> <p>Prices will be based on local populations ability to pay and should not be influenced by tourist influx</p> <p>Regulations preventing outsiders from owning land within the community area (e.g. Sagada)</p>
Economic dependence of the local community on tourism	<p>Tourism is only an added source of revenue other traditional sustainable sources of livelihood should still be encouraged</p> <p>Mixed Sustainable Land use: land is not only used for tourism but also traditional livelihoods such as: swidden farming, agriculture, pasture land, etc...</p>
Seasonal character of jobs	<p>Limiting yearly tourist influx and implementing proper distribution throughout the year so that tourist activity will not be focused on a single season</p> <p>Tourism is only an added source of revenue other traditional sustainable sources of livelihood should still be encouraged</p> <p>Mixed Sustainable Land use: land is not only used for tourism but also traditional livelihoods such as: swidden farming, agriculture, pasture land, etc...</p>

Community Tourism Development

There are several aspects which should be considered when developing community based tourism so that any type of tourism development will take the communities views in to consideration and be community managed so that the primary stakeholders involved will play a significant part in the trekking areas development.

The following are among the aspects that should be considered when thinking about community based tourism development:

1. Be run with the involvement and consent of local communities.
(Local people should participate in planning and managing the tour.)
2. Give a fair share of profits back to the local community.
(Ideally this will include community projects (health, schools, etc).)
3. Involve communities rather than individuals.
(Working with individuals can disrupt social structures.)

4. Be environmentally Sustainable
(Local people must be involved if conservation projects are to succeed.)
5. Respect traditional culture and social structures.
6. Have mechanisms to help communities cope with the impact of western tourists.
7. Keep groups small to minimize cultural / environmental impact.
8. Brief tourists before the trip on appropriate behavior.
9. Not make local people perform inappropriate ceremonies, etc.
10. Leave communities alone if they don't want tourism.
(People should have the right to say 'no' to tourism.)

Recommendations on the development of the trekking route:

Several steps must be taken in order to develop the trails for use as trekking areas:

1. There is a need to map out the other existing trail areas that are not yet a part of this study as they may provide for better routes or provide options in the cases of emergencies for exit points as well as alternate routes when trekkers are not allowed within certain villages due to local situations, such as rituals and inter-village conflicts, prevent them from entering the area of the community.
2. Creation of Central Cordillera Trail Map (Must be Topographic Map) which will include cultural as well as ecosystem and livelihood data and should be updated regularly (at least once a year) in order for it to serve as a management tool for cultural and ecological area based management for the regions trail areas.
3. Coordination with LGU and Baranggay Units in the respective areas to be covered to create local guidelines and management plans for managing the trekking areas within their jurisdiction.
4. Training of Guides and Rangers per Baranggay to be covered by the trail in order to improve the skills base of the communities in order to allow them to properly manage the trail areas in conformance to modern sustainable development strategies when dealing with trekking and ecosystem areas.

5. Training with regards to alternative livelihood sources as in order to be sustainable the communities cannot rely solely on eco-tourism, there must be diversity in livelihood opportunities
6. Creation of support structures to support the influx of foreign and local trekkers who want to trek in the region's trails
7. Creation of environmental and cultural management plan for the whole area that is in conformance with local needs of the different villages that are covered by the trail.
8. Establishment or identification of central governing structure to maintain and manage the trail system and its surrounding areas. One option is to use the Regional Development Council as it is composed of the entire local and provincial government units as well as the NEDA and agencies associated with regional development. Thus they would be in the position to give relevant recommendations to management options and feedback on trail areas within their respective areas of jurisdiction.
9. Enhancement and Protection of the quality of the areas ecological resources. In line with trails development there is a clear need to enhance already degraded areas to prevent environmental conflicts from occurring and promote the areas as parts of significant trekking destinations.
10. There is also a need to enhance and protect the different areas cultural resources. As in some areas cultural resources are now fast disappearing and the entry of tourism may further degrade cultural resources in the areas wherein they are already degraded as well as in those areas that still hold their culture intact.
11. Aside from local initiatives there is also a need to come up with a regional policy that establishes the Region as Cultural and Ecological Sanctuaries with special development needs tailored to the local situations within the different areas in order for the policy to be adapted to local situations.

Concerns with regards to the development of the trail areas for Trekkers:

Several concerns have been put forward in line with the development of the trails and their surrounding areas for Trekkers:

1. The project must not put added pressure on the resources in the areas. E.g. fuel wood, water, flora and fauna as well as cultural resources. Therefore any development and regulations governing the entry of trekkers into the area should take this into consideration when coming up with trekking policies, such as Leave no trace, fuel use of only stoves and not local wood resources, etc., that would govern the trekker's use of the trail and its surrounding areas.
2. Trekkers must respect for the culture and traditions of the people who live in the areas to be covered by the trekking route
3. There should be a limited number of visitors per year, this is aimed at those tourists who have a serious interest in, and respect for, the region's culture and environment. In this case as the areas are sensitive, both culturally and ecologically we must follow a process of controlled tourism development
4. There is also a need for constant monitoring of tourism in the areas in order to address problems that may arise from the development of the trekking area.
5. Should encourage young Cordilleran's to be proud of their culture instead of promoting values from the trekkers and any policies towards this effect should take this into consideration.
6. Trekking development in these areas must be continuously responsive to local peoples concerns

Recommendations for governance and policy creation for trails development

Local Communities

As the primary stakeholders in this type of development, local communities should be involved in the development and implementation of tourism plans, in order to enhance their success. And to provide the management plans with an appropriate local context to their implementation.

In line with this there is a need to create local community cultural and environmental management plans as cultural norms and environmental practices may differ from one

community to another: e.g. closing down of a village to outsiders due to certain rituals or periods during the year. These local circumstances have to be taken into consideration especially when determining the management plans as well as rules and regulations governing the entire trail.

Besides creating their own regulations to govern the areas covered by their respective territories there is a need for training with regards to proper dealing with tourists and to orient communities with the costs and benefits of eco-tourism development. As it is local communities more often see tourism as merely revenue and often overlook the different effects it has on their socio-cultural landscape.

As the primary stakeholders it is also their duty to protect and enhance the local ecosystem as well provides feedback and recommendations on the effects of tourism on their community and ecology in order to provide relevant measures to mitigate any harmful effects tourism may have on their community and local ecology.

Local Provincial and LGUs

The local government units that govern the different areas covered by the trail will need to develop their own set of rules and regulations applicable within their boundaries to suit the specific circumstances of their local economic, social and environmental situations.

They will also need to continuously map existing trails within their jurisdiction so that these trails and their surrounding areas can be protected from further degradation as well as providing resource managers' relevant up to date information on the status of the different trails and the ecological areas surrounding them so that they can respond appropriately.

Regional Level

At the regional level (CAR) there is a need to create a policy that establishes the trail and its surrounding areas as Cultural and Ecological Sanctuaries (Policy) and will protect the area from degradation arising from resource destructive and polluting activities

The region should also provide a flexible legal framework for the different LGUs and provinces covered to develop their own set of rules and regulations applicable within their boundaries to suit the specific circumstances of their local economic, social and environmental situations, while maintaining consistency with overall regional objectives of sustainable development. In line with this legislation and regulatory structures need to be standardized and simplified to improve clarity and remove inconsistencies.

There should be regional collaboration for integrated tourism and conservation development planning and Develop regional strategies to address trans-boundary environmental issues –this is especially important in the region due to the differing natural resource management strategies used by the different ethnic groups in the Cordillera –e.g. river system communities

There is also the need to create a trail Map that will show the different trails in the region and determination of which trails will be used and opened to eco-tourism based on ecological values and local perceptions to eco-tourism development. It will also be used to determine the scope of the area to be covered by the policy. This map should also be updated regularly with data on local conditions coming from the communities or local government units in order to provide real time updates on conditions occurring in the trail conservation areas and providing relevant responses to given local conditions.

In line with the different objectives and goals of the project it is the responsibility of the regional council to develop mechanisms for measuring progress, such as indicators for sustainable tourism and environmental indicators that are attainable and appropriate to the management area.

As the scope of the trail covers a large land area, covering at least 5 different provinces, several eco-regions and many different ethnic groups the creation of a regional framework and central structure to manage the trails and their surrounding areas is needed in order to put together the many different areas that are covered by the trail, this would be

similar to the Annapurna Conservation Area Program in Nepal which covers the entire mountain region of the Annapurna mountain range. On a similar scale it can be implemented in the Central Cordillera region as well -*Cordillera Conservation Area Authority?*

Project Timeline for Trail Development for Trekking

Timeline: establishment: 3 years

Year 1	Year 2	Year 3
Mapping	Training of Guides and relevant staff	Initial opening of trail to a limited number of travelers
Creation of Trail Maps	Establishment of coordinating agency for trail management	Monitoring and Feedback from communities
Initial Coordination with agencies concerned and LGUs	Alternative livelihood training or enhancement of already existing practices	Assessment and Program re-evaluation and Improvement
Policy Creation to protect the trails	Cultural and Ecological enhancement	Continuation of alternative livelihood training or enhancement of already existing practices
	Creation of environmental and Cultural Management plan	Cultural and Ecological enhancement

Year 4	Year 5
Trail Maintenance and enhancement of surrounding areas	Trail Maintenance and enhancement of surrounding areas
Promotion of trail	Promotion of trail and region
Opening trail to a larger group of travelers but still must be limited	Re-assessment, Community feedback, Traveler feedback
Cultural and Ecological enhancement	Cultural and Ecological enhancement
Continuation of alternative livelihood training or enhancement of already existing practices	Continuation of alternative livelihood training or enhancement of already existing practices
Traveler feedback	Implementation of measures to address the concerns of communities and travelers

Conclusion

“Nepal is here to change you, not for you to change Nepal” –these are the words imprinted in bold letters on the Nepal’s minimum impact code of travel⁸⁸. Wise words that more often are not heeded when thinking of tourism development in the Philippines. Instead it has become the practice to seek to please our visitors; Filipino hospitality has extended so much so that we changed our very culture and environs to please our guests. But then there is another way, and tourism, if done properly, has the potential for rural poverty alleviation, conservation, and sustainable development.

The Cordillera trails project presents us with a novel way of approaching the development of our mountain environment, and although we see the need to protect this fragile ecosystem we must also be aware of the peoples living within it and any type of development must be aware of the intricacies and interactions of the different cultures and the environment as well as provide equitable access to economic opportunities that are often forgotten in many conservation strategies which effectively alienate the local populations from the use of their traditional resources.

The focus of resource development within the areas covered by the trail is to apply a new innovative ecological and cultural area based approach to management that will enhance the community stability, encourage economic diversification, and increase local economic development while still taking into consideration the ecological place-based values and meanings of landscapes translating and amplifying community based knowledge so that they become visible to other scales and processes in resource management on a scale larger than the single community.

The development of the existing trails into a sustainable trekking enterprise will not only support local livelihoods but will also serve as form of development that is in tune with the needs of the mountain ecosystem and its peoples. The increased local revenue from the influx of tourists will serve to bolster local economies and prevent further pressure on local

⁸⁸ Appendix 2: Minimum Impact code of travel in Upper Mustang

resources due to pressure arising from rural poverty. While the other benefits of trails development such as enhanced local ecology and the provision of better ecosystem services will allow the local communities to diversify sources of revenue to integrate new forms of income generating mechanisms such as CDM and ecosystem user fees while still maintaining a healthy environment.

The improved natural environment and sustainable utilization of the local resources will also ensure that the primary source of local capital, the environment, is kept in a form that will continuously provide its services for the local communities reducing the incidence of rural poverty, environmental conflicts, and health hazards arising from degraded environmental conditions.

Developing the trails of the cordillera do not only give us a novel way of creating a new source of revenue for local communities, it offers us the possibility of creating a form of development that is socially equitable, culturally rooted, and environmentally sustainable for the Philippine Cordillera Mountains and its people.

"The Central Cordillera Traverse has at its core one of the most pressing issues of our day: How can we manage our resources to yield the most positive outcomes for cultural evolution and sustainable development?" "National Geographic is pleased to be funding this important endeavor."

-Rebecca Martin- Director, National Geographic Expeditions Council

List of people Interviewed

Bantik, Itogon, Benguet: Gregorio Pitas

Domolpos, Itogon, Benguet: Lakay Coditio

Pangawan, Kayapa, Nueva Vizcaya: Barangay Capt. Velasco Windo jr. & Adilin –Midwife

Sitio Naayew, Pangawan, Kayapa, Nueva Vizcaya: Rudy Tuleng

Banao, Kayapa, Nueva Vizcaya: Kagawad Gonzalo Tuctukan

Abat, Kayapa, Nueva Vizcaya: Midwife of Abat

Sitio Gulgulunan, Lusod, Kabayan, Benguet: Manong Bayason

Dango, Tinoc, Ifugao: Marcus Bilao: Mt. Pulag Guide

PAO: Daisy Moresto: Mt. Pulag Park Ranger

Sitio Lebbeng, Tawangan, Kabayan, Benguet: Lakay Tibaldo

Sitio Ta-aw, Tawangan, Kabayan, Benguet: Nilo Lomasteo

Tinoc, Ifugao: Mrs. Betty B. Halip, Mayor of Tinoc

Tucukan, Tinoc, Ifugao: Kagawad Andres Pumahing Biao, Barangay Capt. Halip,
Baranggay officials of Tucukan

Tuludan, Tinoc, Ifugao: DSWD officer of Tuludan

Wang-Wang, Tinoc, Ifugao: Councilman Francisco Dumanop

Abatan, Tinoc, Ifugao: Alberto Ananayo

Hungduan, Ifugao: Lito –Mt. Napulawan Guide

Battad, Banaue, Ifugao: Manang Christina, Baket Mar-eng Pucha

Patyay, Mayaoyao, Ifugao: Lakay Umog

Mt. Amuyao repeating station: Manong Peter: caretaker for 30 years: PT& T tower

Barlig, Mountain Province: Municipal Mayor, Staff of the Municipal Mayor

Lingoy, Barlig, Mountain Province: Barangay Capt. Patricio Lingayo

Betwagan, Sadangga, Mountain Province: Sabina Lumatac, Mark Lumatac, Richard Lumatac, Baket Wamad-an, Fag-ay Gayaman

Sadangga, Mountain Province: Arturo Fegcan, Chief of Police Fegcan, Sadangga Police officials

Sakasakan, Sadangga, Mountain Province: Maliweng

Mainit, Bontoc, Mountain Province: Lakay Odsey

Dalic, Bontoc, Mountain Province: Baranggay Capt. Benjamin Lapaan, Councilman Manuel Banganon

Fidelisan, Sagada, Mountain Province: Francis Suyam

Besao, Mountain Province: Melanie Timmango –Municipal Budget officer, Vice Mayor of Besao

Agawa, Besao, Mountain Province: Baranggay Capt. of Agawa

Ambagiw, Besao, Mountain Province: Barangay officials of Ambagiw, Baket Pastola Matalingay

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WATERSHED

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http://sgp.undp.org/download/SGP_Philippines1.pdf

SUSTAINABLE FORESTRY

<http://forestry.denr.gov.ph/C&I.doc>

ECOTOURISM

www.philipinecotours.gov.ph

BIODIVERSITY

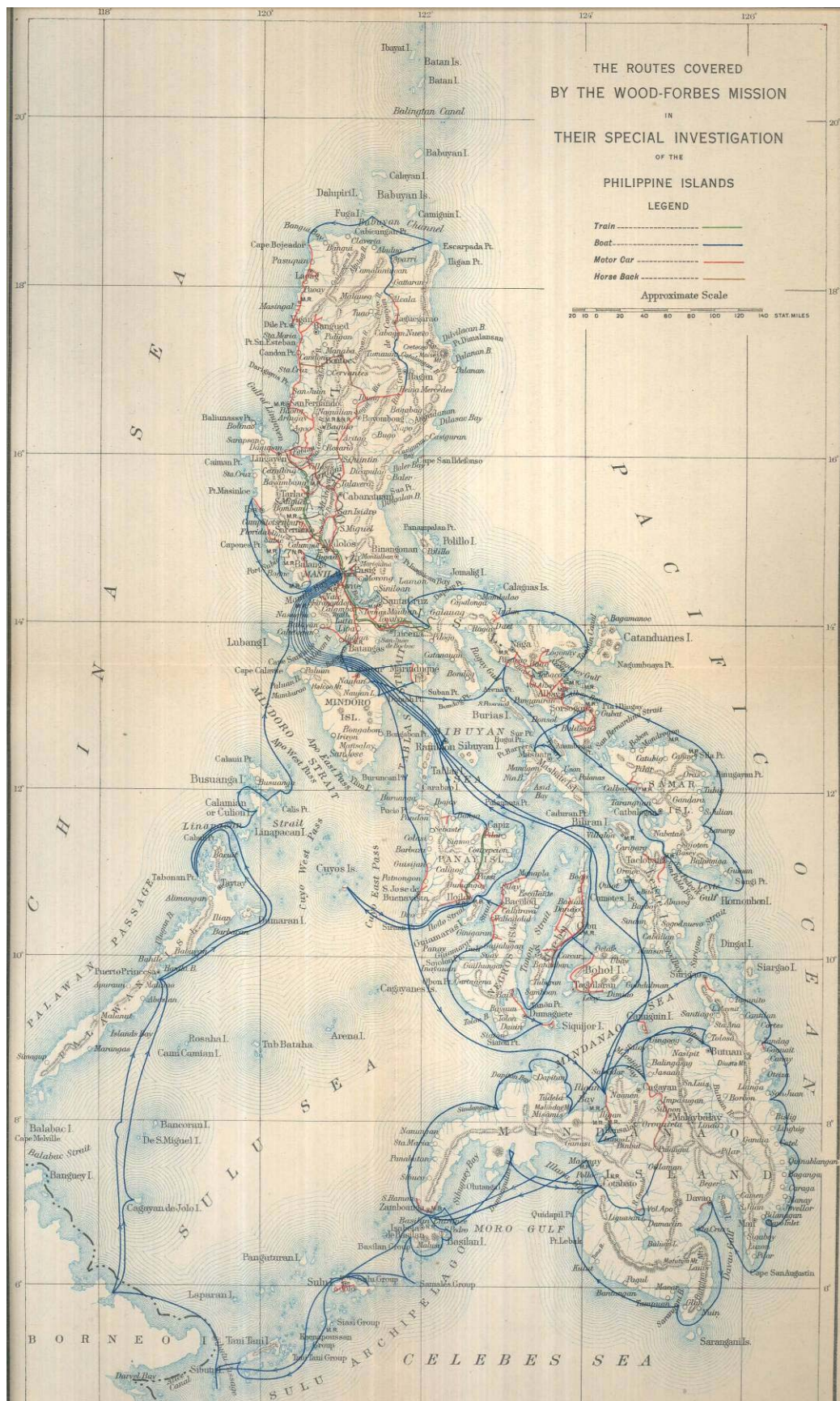
Biodiversity Hotspots – <http://www.biodiversityhotspots.org/xp/Hotspots/Philippines>

Haribon Foundation – <http://www.haribon.org>

Tanggol-Kalikasan - <http://www.tanggol.org>

Appendix 1:

Wood-Forbes Mission Special Investigation into the Philippine Islands Map



Appendix 2

Letter of Guarantee for trekking in Upper Mustang

The Ministry of Tourism has developed a 'Letter of Guarantee' to be signed and followed by a trekkers prior to their departure for Upper Mustang:

"We, a team of (number of persons)_____trekkers, have accepted to go to trek to (name of place) _____ from (dates) _____ to _____ under the following conditions :

1. We agree to go through a registered trekking agency.
2. We agree to take an Environment Officer along with us on our trip.
3. We shall not undertake any activity forbidden by the Environment Officer.
4. The Environment Officer will report to concerned officials in case problems arise during the trek.
5. We shall register our names in police check posts and other check posts along the route.
6. We shall not enter any restricted area, and we shall follow prescribed routes.
7. Until and unless an emergency arises, we shall not split into sub-groups in order to take different trekking routes.
8. We shall do nothing to destroy the cultural heritage and the natural environment.
9. We shall keep the trekking route and environment clean.
10. We shall keep the trekking route and environment clean (sic).
11. We agree to carry back all non-burnable and non-biodegradable garbage.

S.No. Trekker Name Passport No. Nationality Signature

(Source: Ministry of Tourism, Nepal, 2000)

Minimum impact code for travel to Upper Mustang

This minimum code is issued to tourists prior to their visit to Upper Mustang in a bid to raise awareness of the conservation of the environmental and cultural integrity of the region:

"As visitors and friends, you are asked to help conserve the sanctity and beauty of the Upper mustang region for the generations to come. Here are a few tips on ways to "step gently" in this fragile area.

Travel ecologically

- In Jomson and Upper Mustang, it is possible to rent horses and ponies, which are traditionally used for transportation and as pack animals. In fact, the people of Upper Mustang are not fully habituated to accommodating porters. To maintain tradition, and to minimise the environmental burden created by porters, it is recommended that ponies be used instead.

Save fuel

- Fuel is a scarce commodity in Upper Mustang. Many travel for over a day to collect firewood, thorny Taklang bushes, and then spend another day returning. Others spend hours collecting goat and sheep pellets. In order not to further aggravate the problem of fuel gathering, it is forbidden for groups to buy firewood from the communities in Upper Mustang. All groups to Upper Mustang must demonstrate that they are self-sufficient in fuel before departing Jomsom. (Note that kerosene may not be readily available in Jomsom until the establishment of a fuel depot).
- During the trek, make sure your staff uses kerosene or gas for cooking. Do not make open fires. Limit hot showers. Bring adequate clothing for yourself, and ensure that your trekking staff is also warmly clothed.

Do not pollute

- In order to minimise pollution, burn all paper products, including toilet paper, cigarette butts, non-plastic and non-foil wrappers. Carry out all non-burnable rubbish like bottles, plastics, cans, and batteries. These may be disposed of in Jomsom. Vegetables and food scraps should be properly buried or fed to stock animals.
- Use available toilet facilities, and make sure that your trekking agency carries along a toilet tent. Supervise your trekking staff to make sure that they cover toilet pits. On the trail, make sure that you are at least 50 meters away from any water source when relieving yourself. When bathing, use only biodegradable soaps, and wash away from streams, as they are the only source of drinking water.

Protect wildlife

- Due to the limited carrying capacity of the desert environment, wildlife densities in Upper Mustang are very low. Nevertheless, in addition to the many species naturally found on the Tibetan Plateau, Upper Mustang is host to rare species such as Argali sheep, wild ass (kyang), and snow leopard.
- It is illegal to interfere with wildlife or their habitat in any manner, or to purchase any item made of rare or endangered animal parts. Please respect the fragile ecology of the area by avoiding walking on vegetation or collecting plants and flowers.

Respect the culture

- Upper Mustang is replete with religious sites such as gompas (monasteries), chortens (structures for worship), abandoned caves, and reliquaries of ruined monasteries. These sites are a remarkable showcase for a culture that is ancient, yet alive.
- In order to assure the security of monuments and structures, it is essential that most of these areas, and especially the abandoned caves, be off-limits to trekkers and their staff.

- Local residents may wish gompas to be off-limits to tourist, or accessible for a small fee or donation. As the local people are the custodians of their culture, trekkers are asked to abide by their wishes.
- Please do not remove any religious artifacts from the area.
- Respect local customs in your dress and behavior. Women should not wear shorts or revealing shirts. Men should always wear shirts. Avoid outward displays of affection. Nudity is highly prohibited.
- Ask permission to take photographs and respect people's right to privacy.
- Do not give anything to beggars unless they are legitimate religious mendicants.
- Encourage young Nepalis to be proud of their culture.
- Above all remember that your vacation has a great impact on the natural environment and on the people who live off its resources. By assisting in these small ways, you will help the land and people of Nepal.

"Nepal is here to change you, not for you to change Nepal."

(Source: Ministry of Tourism, Nepal, 2000)

Appendix 3

Tourism Impacts

Natural Resource Impacts

Tourism development can put pressure on natural resources when it increases consumption in areas where resources are already scarce, such as in areas of the Cordillera region where large scale extractive industries have depleted surface and underground resources or polluted natural ecosystems.

Water resources

Water, and especially fresh water, is one of the most critical natural resources. The tourism industry generally overuses water resources for lodging and personal use of water by tourists. This can result in water shortages and degradation of water supplies, as well as generating a greater volume of waste water.

Due to the large amount of energy and exertion to be done during the trek it is likely that tourists will consume large amounts of water both for consumption and cleaning, thus in areas of water scarcity this may be a major concern during the peak tourist seasons, which are more often during the drier months of the year.

Local Resources

Tourist influx can create greater pressure on local resources like energy, food, and other raw materials that may already be in short supply. Greater extraction and transport of these resources exacerbates the physical impacts associated with their exploitation.

Because of tourism's seasonal nature eco-tourism areas may have a 1000% increase in the population than during the off season. A high demand is placed upon these resources to meet the high expectations tourists often have (proper heating, hot water, etc.).

Land degradation

Important land resources include minerals, fossil fuels, fertile soil, forests, wetland and wildlife. Increased construction of tourism and recreational facilities has increased the pressure on these resources and on scenic landscapes. Direct impact on natural resources, both renewable and nonrenewable, in the provision of tourist facilities can be caused by the use of land for accommodation and other infrastructure provision, and the use of building materials.

Forests often suffer negative impacts of tourism in the form of deforestation caused by fuel wood collection and land clearing. For example, one trekking tourist in Nepal - and area already suffering the effects of deforestation - can use four to five kilograms of wood a day.

Pollution

Tourism can cause the same forms of pollution as any other industry: air emissions, noise, solid waste and littering, releases of sewage, oil and chemicals, even architectural/visual pollution.

Air Pollution and Noise

Transport by vehicles will exacerbate CO₂ and particulate emissions in the area or in the areas leading to the eco-tourism site.

The greater numbers of tourists often bring along contraptions such as radios, speakers, and other noise making devices, not to mention the noise produced simply by the increase in population causes annoyance, stress, and even hearing loss for humans, it causes distress to wildlife, especially in sensitive areas.

Solid Waste and Littering

Waste disposal is a serious problem and improper disposal can be a major despoiler of the natural environment - rivers, scenic areas, and roadsides

In mountain areas, trekking tourists generate a great deal of waste. Tourists on expedition leave behind their garbage, and even camping equipment. Such practices degrade the environment with all the detritus typical of the developed world, in remote areas that have few garbage collection or disposal facilities.

Sewage

Sewage pollution from increased tourist activity can threaten the health of humans and animals. Wastewater has polluted rivers and lakes surrounding tourist attractions, damaging the flora and fauna.

The increase in number of people is always accompanied with the increase in biological waste –in the Cordillera this will be located in pristine areas which do not have proper sewage systems that can handle the pollution load of additional occupants as in these areas sewage treatment still relies on natural systems thus dramatic increases in populations will naturally result in imbalance of these mechanisms.

Aesthetic Pollution

Tourism development often fails to integrate its structures with the natural features and indigenous architecture of the area.

The lack of local land use planning often results in unplanned and half hazard development that often bespoils the natural beauty and characteristics of an area. An example of this would be the development of Banaue, where most tourist facilities grew from household enterprises

to 4 story buildings without the proper supporting infrastructure or planning that would have made the area more aesthetically compatible with the culture of the Ifugao.

Physical Impacts

Attractive landscape sites, such as sandy beaches, lakes, riversides, and mountain tops and slopes, are often transitional zones, characterized by species-rich ecosystems. Typical physical impacts include the degradation of such ecosystems. The threats to and pressures on these ecosystems are often severe because such places are very attractive to both tourists and developers.

Physical impacts are caused not only by tourism-related land clearing and construction, but by continuing tourist activities and long-term changes in local economies and ecologies.

Construction Activities and Infrastructure Development

Activities such as the building of inn's sewage and water systems can cause severe disturbance and erosion of the local ecosystem, even destruction in the long term.

Road construction can lead to land degradation, siltation of waterways and loss of wildlife habitats and deterioration of scenery.

Deforestation and intensified or unsustainable use of land

Construction of accommodation and facilities frequently requires clearing forested land especially in the areas in the cordillera where the main source of materials is the adjacent forest areas

The increased pressure on local forests results in degradation, erosion, and loss of water recharge capacities will eventually result in the degradation of local ecosystems.

Trampling

Tourists using the same trail over and over again trample the vegetation and soil, eventually causing damage that can lead to loss of biodiversity and other impacts. Such damage can be even more extensive when visitors frequently stray off established trails.

Trampling impacts on vegetation	Trampling impacts on soil
Breakage and bruising of stems	Loss of organic matter
Reduced plant vigor	Reduction in soil macro porosity
Reduced regeneration	Decrease in air and water permeability

Loss of ground cover	Increase in run off
Change in species composition	Accelerated erosion
Source: University of Idaho	

Alteration of ecosystems by tourist activities

Habitat can be degraded by tourism leisure activities. For example, wildlife viewing noise and visual pollution can bring about stress increase pressure on local wildlife and alter their natural behavior when tourists come too close to flora and faunal species in the area.

Socio-Cultural Impacts of Tourism Activities

This factor is most often overlooked in tourism development as the large influx of different types of people due to tourism development often results in detrimental changes to a particular society who plays the host for tourist activities.

There are 4 major impacts associated with tourism activities: Change or loss of indigenous identity and values, Culture clashes, Physical influences causing social stress, and Ethical issues.

Change or loss of indigenous identity and values

Commodification

Tourism can turn local cultures into commodities when religious rituals, traditional ethnic rites and festivals are reduced and sanitized to conform to tourist expectations, resulting in what has been called "reconstructed ethnicity." This is quite evident in certain areas in the Cordillera where clothing is only worn for tourist and rituals such as the butchering of pigs to honor the dead are done to please tourist expectations of indigenous cultures.

Once a destination is sold as a tourism product, and the tourism demand for souvenirs, arts, entertainment and other commodities begins to exert influence, basic changes in human values may occur. Sacred sites and objects may not be respected when they are perceived as goods to trade. Such is the case in Benguet where the local Ibaloi mummies have become hot commodities on the international black market for antiquities.

Standardization

Destinations risk standardization in the process of satisfying tourists' desires for familiar facilities.

While landscape, accommodation, food and drinks, etc., must meet the tourists' desire for the new and unfamiliar, they must at the same time not be too new or strange because few tourists are actually looking for completely new things. Tourists often look for recognizable

facilities in an unfamiliar environment, like well-known fast-food restaurants and hotel chains.

Loss of authenticity and staged authenticity

Adapting cultural expressions and manifestations to the tastes of tourists or even performing shows as if they were "real life" constitutes "staged authenticity".

Adaptation to tourist demands

Tourists want souvenirs, arts, crafts, and cultural manifestations, and in many tourist destinations, craftsmen have responded to the growing demand, and have made changes in design of their products to bring them more in line with the new customers' tastes. While the interest shown by tourists also contributes to the sense of self-worth of the artists, and helps conserve a cultural tradition, cultural erosion may occur due to the commodification of cultural goods.

Culture clashes

Because tourism involves movement of people from different geographical locations, and establishment of social relations between people who would otherwise not meet, cultural clashes can take place as a result of differences in cultures, ethnic and religious groups, values and lifestyles, languages, and levels of prosperity.

This is especially evident in the cordillera region where even within the different ethnic groups there are clashes in the culture. The result can be an overexploitation of the social carrying capacity (limits of acceptable change in the social system inside or around the destination) and cultural carrying capacity (limits of acceptable change in the culture of the host population) of the local community.

Economic inequality

Many tourists come from societies with different consumption patterns and lifestyles than what is current at the destination, seeking pleasure, spending large amounts of money and sometimes behaving in ways that even they would not accept at home. One effect is that local people that come in contact with these tourists may develop a sort of copying behavior, as they want to live and behave in the same way. Especially in less developed countries, there is likely to be a growing distinction between the 'haves' and 'have-nots', which may increase social and sometimes ethnic tensions. In resorts in destination countries such as Jamaica, Indonesia or Brazil, tourism employees with average yearly salaries of US\$ 1,200 to 3,000 spend their working hours in close contact with guests whose yearly income is well over US\$ 80,000.

Irritation due to tourist behavior

Tourists often, out of ignorance or carelessness, fail to respect local customs and moral values. When they do, they can bring about irritation and stereotyping. They take a quick snapshot and are gone, and by so acting invade the local peoples' lives.

Job level friction

In developing countries especially, many jobs occupied by local people in the tourist industry are at a lower level, such as housemaids, waiters, gardeners and other practical work, while higher-paying and more prestigious managerial jobs go to foreigners or "urbanized" nationals.

This may cause friction and irritation and increases the gap between the cultures.

Physical influences causing social stress

The physical influences that the increasing tourism flows, and its consequent developments, have on a destination can cause severe social stress as it impacts the local community. Socio-cultural disadvantages evolve from:

Resource use conflicts:

Such as competition between tourism and local populations for the use of prime resources like water and energy because of scarce supplies. Stress to local communities can also result from environmental degradation and increased infrastructure costs for the local community - for example, higher taxes to pay for improvements to the water supply or sanitation facilities.

Cultural Deterioration:

Damage to cultural resources may arise from vandalism, littering, pilferage and illegal removal of cultural heritage items. A common problem at archaeological sites in countries such as Egypt, Colombia, Mexico and Peru is that poorly paid guards supplement their income by selling artifacts to tourists. Furthermore, degradation of cultural sites may occur when historic sites and buildings are unprotected and the traditionally built environment is replaced or virtually disappears.

Conflicts with traditional land-uses:

Especially in intensely exploited areas, conflicts arise when the choice has to be made between development of the land for tourist facilities or infrastructure and local traditional land-use. The indigenous population of such destinations is frequently the loser in the contest for these resources as the economic value which tourism brings often counts for more.

Ethical issues

Partly due to the above impacts, tourism can create more serious situations where ethical and even criminal issues are involved.

Crime generation

Crime rates typically increase with the growth and urbanization of an area, and growth of mass tourism is often accompanied by increased crime. The presence of a large number of tourists with a lot of money to spend, and often carrying valuables such as cameras and jewelry, increases the attraction for criminals and brings with it activities like robbery and drug dealing. This is clearly evident in the areas like Sagada and Banaue and recently Hungduan where the increase in tourist activity has resulted in several holdups and petty thievery.

Child labour

ILO studies show that many jobs in the tourism sector have working and employment conditions that leave much to be desired: long hours, unstable employment, low pay, little training and poor chances for qualification. In addition, recent developments in the travel and tourism trade (liberalization, competition, concentration, drop in travel fares, growth of subcontracting) and introduction of new technologies seem to reinforce the trend towards more precarious, flexible employment conditions. For many such jobs young children are recruited, as they are cheap and flexible employees.

Prostitution and sex tourism

The commercial sexual exploitation of children and young women has paralleled the growth of tourism in many parts of the world. Though tourism is not the cause of sexual exploitation, it provides easy access to it. Tourism also brings consumerism to many parts of the world previously denied access to luxury commodities and services. The lure of this easy money has caused many young people, including children, to trade their bodies in exchange for T-shirts, personal stereos, bikes and even air tickets out of the country. In other situations children are trafficked into the brothels on the margins of the tourist areas and sold into sex slavery, very rarely earning enough money to escape.

Economic Impacts of Tourism

The tourism industry generates substantial economic benefits to both host countries and tourists' home countries. Especially in developing countries, one of the primary motivations for a region to promote itself as a tourism destination is the expected economic improvement.

As with other impacts, this massive economic development brings along both positive and negative consequences.

NEGATIVE ECONOMIC IMPACTS OF TOURISM

There are many hidden costs to tourism, which can have unfavorable economic effects on the host community. Often rich countries are better able to profit from tourism than poor ones. Whereas the least developed countries have the most urgent need for income, employment

and general rise of the standard of living by means of tourism, they are least able to realize these benefits. Among the reasons for this are large-scale transfer of tourism revenues out of the host country and exclusion of local businesses and products.

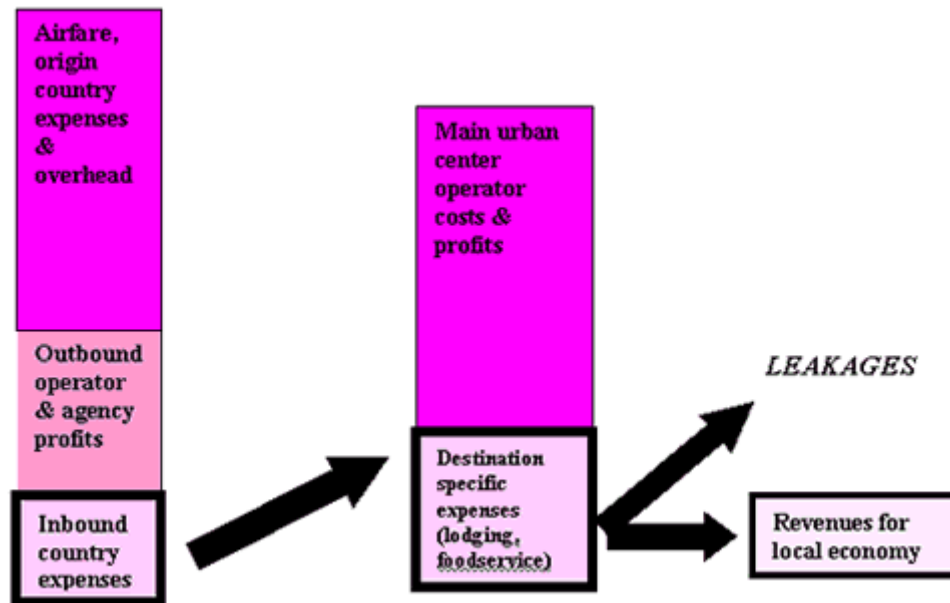
Leakage

The direct income for an area is the amount of tourist expenditure that remains locally after taxes, profits, and wages are paid outside the area and after imports are purchased; these subtracted amounts are called leakage. In most all-inclusive package tours, about 80% of travelers' expenditures go to the airlines, hotels and other international companies (who often have their headquarters in the travelers' home countries), and not to local businesses or workers. In addition, significant amounts of income actually retained at destination level can leave again through leakage.

A study of tourism 'leakage' in Thailand estimated that 70% of all money spent by tourists ended up leaving Thailand (via foreign-owned tour operators, airlines, hotels, imported drinks and food, etc.). Estimates for other Third World countries range from 80% in the Caribbean to 40% in India.

Source: [Sustainable Living](#)

Of each US\$ 100 spent on a vacation tour by a tourist from a developed country, only around US\$ 5 actually stays in a developing-country destination's economy. The figure below shows how the leakage happens.



There are two main ways that leakage occurs:

Import leakage This commonly occurs when tourists demand standards of equipment, food, and other products that the host country cannot supply. Especially in less-developed countries, food and drinks must often be imported, since local products are not up to the hotel's (i.e. tourist's) standards or the country simply doesn't have a supplying industry. Much of the income from tourism expenditures leaves the country again to pay for these imports.

The average import-related leakage for most developing countries today is between 40% and 50% of gross tourism earnings for small economies and between 10% and 20% for most advanced and diversified economies, according to [UNCTAD](#).

Even in developed regions, local producers are often unable to supply the tourism industry appropriately even if good will is present: the 64-room hotel "Kaiser im Tirol" in Austria, an award-winning leader in sustainable practices, cannot find organic food suppliers in the local farming networks in the appropriate quantity, quality and reliability, as production cycles and processes are not compatible with its needs.

Source: Austrian Preparatory Conference for the International Year of Ecotourism, September 2001

Export leakage Multinational corporations and large foreign businesses have a substantial share in the import leakage. Often, especially in poor developing destinations, they are the only ones that possess the necessary capital to invest in the construction of tourism infrastructure and facilities. As a consequence of this, an export leakage arises when overseas investors who finance the resorts and hotels take their profits back to their country of origin.

A 1996 UN report evaluating the contribution of tourism to national income, gross levels of incomes or gross foreign exchange, found that net earnings of tourism, after deductions were made for all necessary foreign exchange expenditures, were much more significant for the industry. This report found significant leakage associated with: (a) imports of materials and equipment for construction; (b) imports of consumer goods, particularly food and drinks; (c) repatriation of profits earned by foreign investors; (d) overseas promotional expenditures and (e) amortization of external debt incurred in the development of hotels and resorts. The impact of the leakage varied greatly across countries, depending on the structure of the economy and the tourism industry. From the data presented in this study on the Caribbean, St. Lucia had a foreign exchange leakage rate of 56% from its gross tourism receipts, Aruba had 41%, Antigua and Barbuda 25% and Jamaica 40%.

Source: [Caribbean Voice](#)

Other negative impacts

Infrastructure cost

Tourism development can cost the local government and local taxpayers a great deal of money. Developers may want the government to improve the airport, roads and other

infrastructure, and possibly to provide tax breaks and other financial advantages, which are costly activities for the government. Public resources spent on subsidized infrastructure or tax breaks may reduce government investment in other critical areas such as education and health.

Increase in prices

Increasing demand for basic services and goods from tourists will often cause price hikes that negatively affect local residents whose income does not increase proportionately.

Tourism development and the related rise in real estate demand may dramatically increase building costs and land values. Not only does this make it more difficult for local people, especially in developing countries, to meet their basic daily needs, it can also result in a dominance by outsiders in land markets and in-migration that erodes economic opportunities for the locals, eventually disempowering residents.

Economic dependence of the local community on tourism

Diversification in an economy is a sign of health, however if a country or region becomes dependent for its economic survival upon one industry, it can put major stress upon this industry as well as the people involved to perform well. Many countries, especially developing countries with little ability to explore other resources, have embraced tourism as a way to boost the economy.

Over-reliance on tourism, especially mass tourism, carries significant risks to tourism-dependent economies. Economic recession and the impacts of natural disasters such as tropical storms and cyclones as well as changing tourism patterns can have a devastating effect on the local tourism sector.

Seasonal character of jobs

The seasonal character of the tourism industry creates economic problems for destinations that are heavily dependent on it. Problems that seasonal workers face include job (and therefore income) insecurity, usually with no guarantee of employment from one season to the next, difficulties in getting training, employment-related medical benefits, and recognition of their experience, and unsatisfactory housing and working conditions.

HOW TOURISM CAN CONTRIBUTE TO ECONOMIC CONSERVATION

The main positive economic impacts of tourism relate to foreign exchange earnings, contributions to government revenues, and generation of employment and business opportunities.

Foreign exchange earnings

Tourism expenditures and the export and import of related goods and services generate income to the host economy and can stimulate the investment necessary to finance growth in

other economic sectors. Some countries seek to accelerate this growth by requiring visitors to bring in a certain amount of foreign currency for each day of their stay and do not allow them to take it out of the country again at the end of the trip.

An important indicator of the role of international tourism is its generation of foreign exchange earnings. Tourism is one of the top five export categories for as many as 83% of countries and is a main source of foreign exchange earnings for at least 38% of countries.

Source: [World Tourism Organization](#)

Contribution to government revenues

Government revenues from the tourism sector can be categorized as direct and indirect contributions. **Direct** contributions are generated by taxes on incomes from tourism employment and tourism businesses, and by direct levies on tourists such as departure taxes. **Indirect** contributions are those originated from taxes and duties levied on goods and services supplied to tourists.

Employment generation

The rapid expansion of international tourism has led to significant employment creation. For example, the hotel accommodation sector alone provided around 11.3 million jobs worldwide in 1995. Tourism can generate jobs directly through hotels, restaurants,

Stimulation of infrastructure investment

Tourism can induce the local government to make infrastructure improvements such as better water and sewage systems, roads, electricity, telephone and public transport networks, all of which can improve the quality of life for residents as well as facilitate tourism.

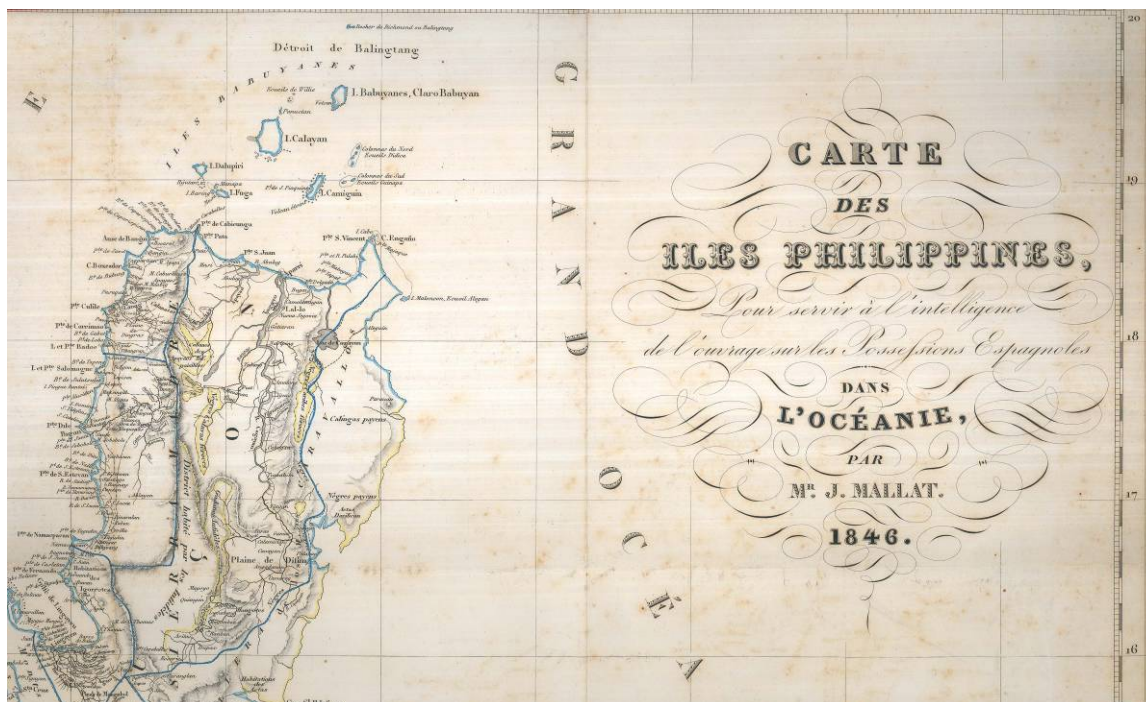
Contribution to local economies

Tourism can be a significant, even essential, part of the local economy. As the environment is a basic component of the tourism industry's assets, tourism revenues are often used to measure the economic value of protected areas.

There are other local revenues that are not easily quantified, as not all tourist expenditures are formally registered in the macro-economic statistics. Money is earned from tourism through informal employment such as street vendors, informal guides, rickshaw drivers, etc. The positive side of informal or unreported employment is that the money is returned to the local economy, and has a great multiplier effect as it is spent over and over again.

Appendix 4

Philippine Maps 1814 & 1846

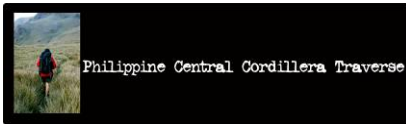




K. Detail from a Spanish Army Map of Bontoc, 1893.



A. The Cordillera Region of Northern Luzon.



Appendix 6

Philippine Central Cordillera Traverse Itinerary

April 2005

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 Dalupirip-Anap	2 Anap-Mt. Ugo Summit
3 Summit-Domolpos-Handupit-Kayapa Central	4 Kayapa Central (Resupply)	5 Kayapa Central-Cabayo	6 Cabayo-Balete	7 Balete	8 Lusod	9 Summit Mt. Pulag
10 Summit Mt. Pulag-Lebbeng-Taaw	11 Taaw- Tinoc Central (Resupply)	12 Gumhang/Tucucan	13 Ahin/ Wang-Wang	14 Hungduan	15 Mt. Napulawan Summit	16 Hapao
17 Banaue (Resupply)	18 Cambulo	19 Patyay or Pula	20 Patyay or Pula	21 Mt. Amuyao Summit	22 Ridge above Barlig	23 Barlig (Resupply) codi day
24 Batakag	25 Mamabui/Gawa Chico River	26 Sadanga?? (Resupply)	27 Mainit	28 Guinaang	29 Dalican	30 Fidelisan

May 2005

1 Sagada (Resupply)	2 Besao	3 Kin-iway	4 Tamboan	5 Dandanac Panabungen	6 Pangwew- Bab Asig	7 Abra River Patyakang-Tirad Pass
8 Gregorio del Pilar-Candon	9 Candon Bus Back to Baguio or to Cervantes to go back to Sabangan	10 Visit to Guilbur's grave	11 Any extension of traverse	12 Any extension of traverse	13 Any extension of traverse	14 Any extension of traverse
15 Last day for any trip extension						

Appendix 7

Philippine Central Cordillera Traverse Press Release



Press Release:

Rediscovering the Grand Cordillera Mountains

(A journey of rediscovery & advocacy for the mountains we call home)

"If the mountains are to remain as free as they were in the time of our ancestors who fought for the right to their land and resources, then once again we must come to see the intrinsic bond that a people have with their land; the land of their ancestors, the land of their children, and the future generation." –*JP Alipio – Philippine Central Cordillera Traverse*

The scent of Soil and Pine hung in the air as the first drops slowly turned into a downpour of crystal dew from the heavens painting the path a glassy green as the rain pelted the landscape. Slowly it seemed out of nowhere the surrounding mountains sprung to life. In between great patches of green; the crystal waters flowed as the springs of life once again renewed the landscape and gave life to the land.

This was June 2002, 3 years ago, the day an idea was born...

On April 1st 2005, five individuals each with a passion for their home, and their people will set out on a journey, one of reawakening not merely for themselves but for a nation and a people who have forgotten the bond that people have with their land. A great man once said: "We are owned by the land...land is a grace that must be nurtured. Land is sacred and beloved." –Macliing Dulag

A Nation so quick to forget the bond we have with the earth. Instead it seems, like the early conquistadores, the people suffer a disease of the heart, one seemingly curable only by the glint of gold. We on the other hand suffer from a disease brought about by this very belief, and seek to explore the cure through this endeavor.

The Journey will take us through the mountains of the Central Cordillera region, climbing through the historic trails that lead into the dwellings of the gods, passed the homes of our people; the Ibaloi, Kankanaï, Iowac, Kalanguya, Ifugao, & Bontoc... the homes of the Igorots... the homes of the Cordillerans.

Our homes are seemingly under siege, “development” has claimed the homes of many communities, the Cordillera being home to the bounties of the earth have provided life for generations, yet today people seek to destroy that which has given us life.

We will trek continuously for 40 days, from Benguet through the mountains of Nueva Vizcaya, Ifugao, and Mountain Province, ending at what once was the gateway into the Cordillera region, Tirad Pass. Climbing down from our mountain homes to the coast of Ilocos Sur.

Foreign explorers have done most discoveries in our land; it is time that Filipinos rediscover our own land and our own people. We walk the mountains of our home not merely because they are there, nor do we wander in search for gold or buried treasure, we walk the mountains to show the Philippines and the World what we will be leaving the future.

“The Central Cordillera Traverse has at its core one of the most pressing issues of our day: How can we manage our resources to yield the most positive outcomes for cultural evolution and sustainable development?” National Geographic is pleased to be funding this important endeavor. *-Rebecca Martin- Director, National Geographic Expeditions Council*

The **Philippine Central Cordillera Traverse** was awarded a grant by the **National Geographic Expeditions Council** in support of the cause that the people who make up the team are struggling to achieve.

The Team:

JP Alipio: The Team Leader and Proponent of the Philippine Central Cordillera Traverse. (Environment, Natural Resource Use, People and Cultures & Environment)

An Ibaloi who traces his roots from La Trinidad, Benguet, a graduate of Biology from the University of the Philippines, he is currently undertaking his Masters Studies in Environmental Management in a joint program of Ateneo de Manila University and San Francisco University. He has been involved with Indigenous Communities developing culturally responsive education and is currently working with the Legal Rights and Natural resource Center/Kasama sa Kalikasan -Friends of the Earth, working with indigenous peoples and communities on environmental and resource issues.

Francis Gerard Alipio: Medic and Researcher (Health)

The Team Leader’s Younger Brother who also shares his Ibaloi heritage. He is tasked to provide emergency first-aid care for the members of the team and will be providing the perspective on the health of the communities that will be passed through during the traverse. He is a Nursing Student from Pines City Colleges in Baguio City

Reuben Muni: Researcher (Historical/Anthropological)

The only member of the team who does not hail from the Cordillera Region, he is a Bicolano but with the heart of a Cordilleran. He finished his degree in BA Social Sciences majoring in Anthropology and Sociology from the University of the Philippines and is currently a member of the UP Baguio, College of Social Sciences Faculty. He is tasked to provide an anthropological and sociological perspective for the traverse.

Jen Godio: Researcher (Women/Education)

The woman of the team, Jen is an Ibaloi who traces her roots from Itogon, Benguet one of the areas most affected by mining and Sabangan, Mountain Province. She has lived in an area that is now an open pit mine. All that is left of her home are the memories that her family tell in stories to friends. She is a graduate of Social Science from the University of the Philippines and is tasked to provide the women's perspective for the traverse as well as a look at the different social structures that pervade in the different communities.

Clint Bangaan: Researcher and Local Coordinator (Education)

Clint is a Kankanaey who traces his roots from Sagada and Besao, Mountain Province. He has been involved in various research and work with Indigenous Communities. He is currently a member of Tebtebba Foundation, an Indigenous Peoples' International center for Policy, research and Education. He holds a degree in Journalism from the University of the Philippines. Clint will be providing the educational perspective and will serve as the local coordinator for the team during the time when the traverse team will be walking through the mountains.

For inquiries and to support the traverse:

Contact:

JP Alipio

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Philippine Central Cordillera Traverse**

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Email: jpalipio@yahoo.com

Or

Clint Bangaan

**Local Coordinator
Philippine Central Cordillera Traverse**

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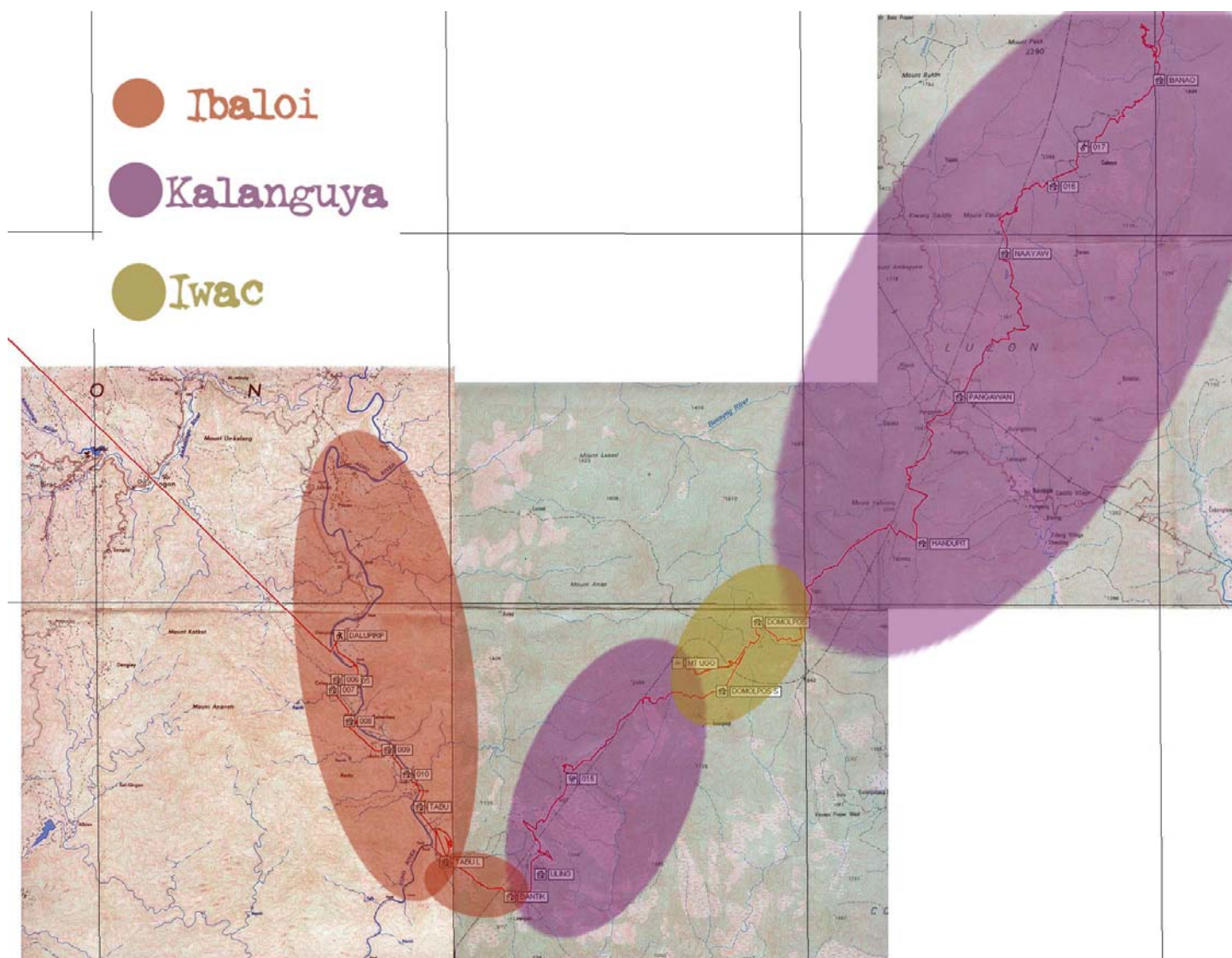
Expeditions Council

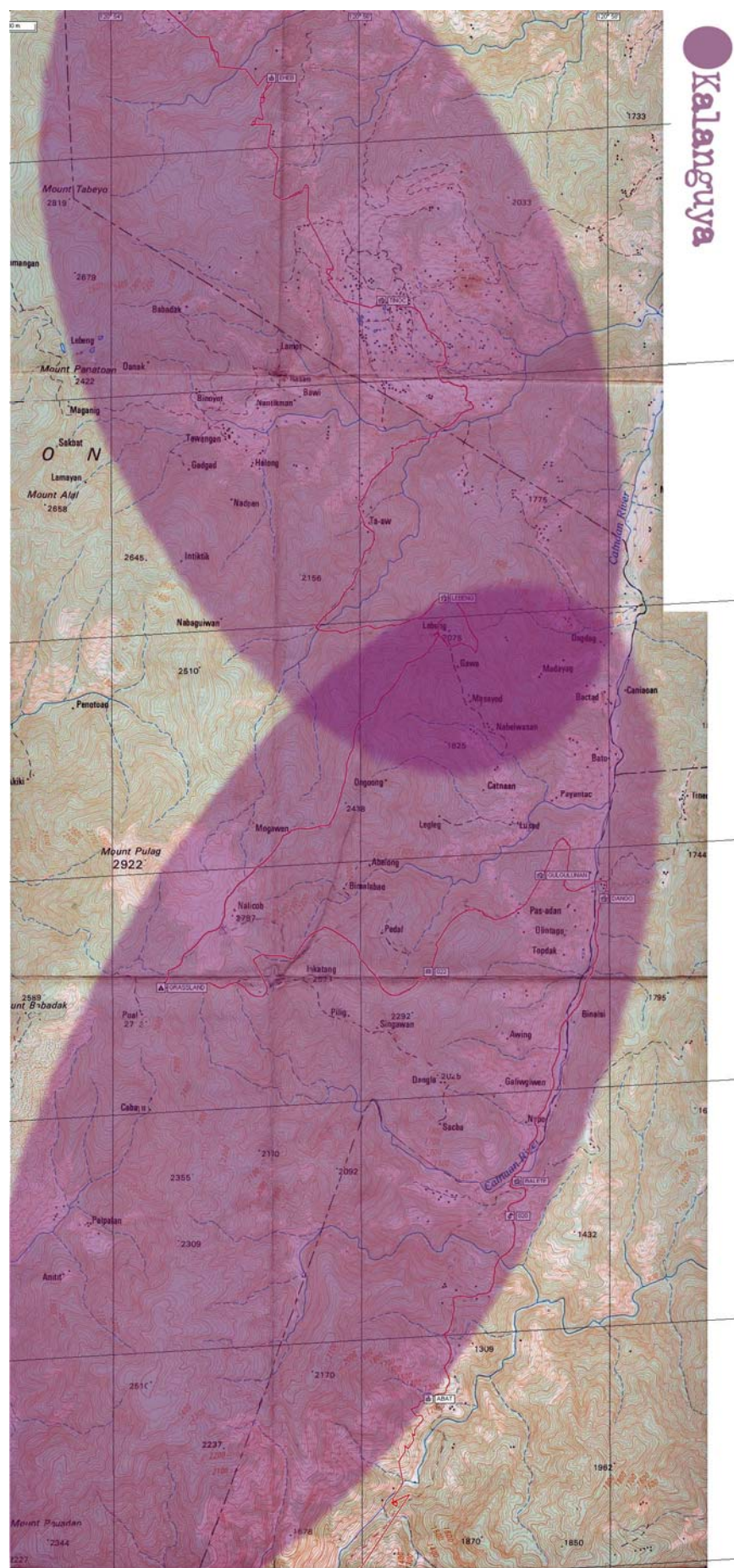


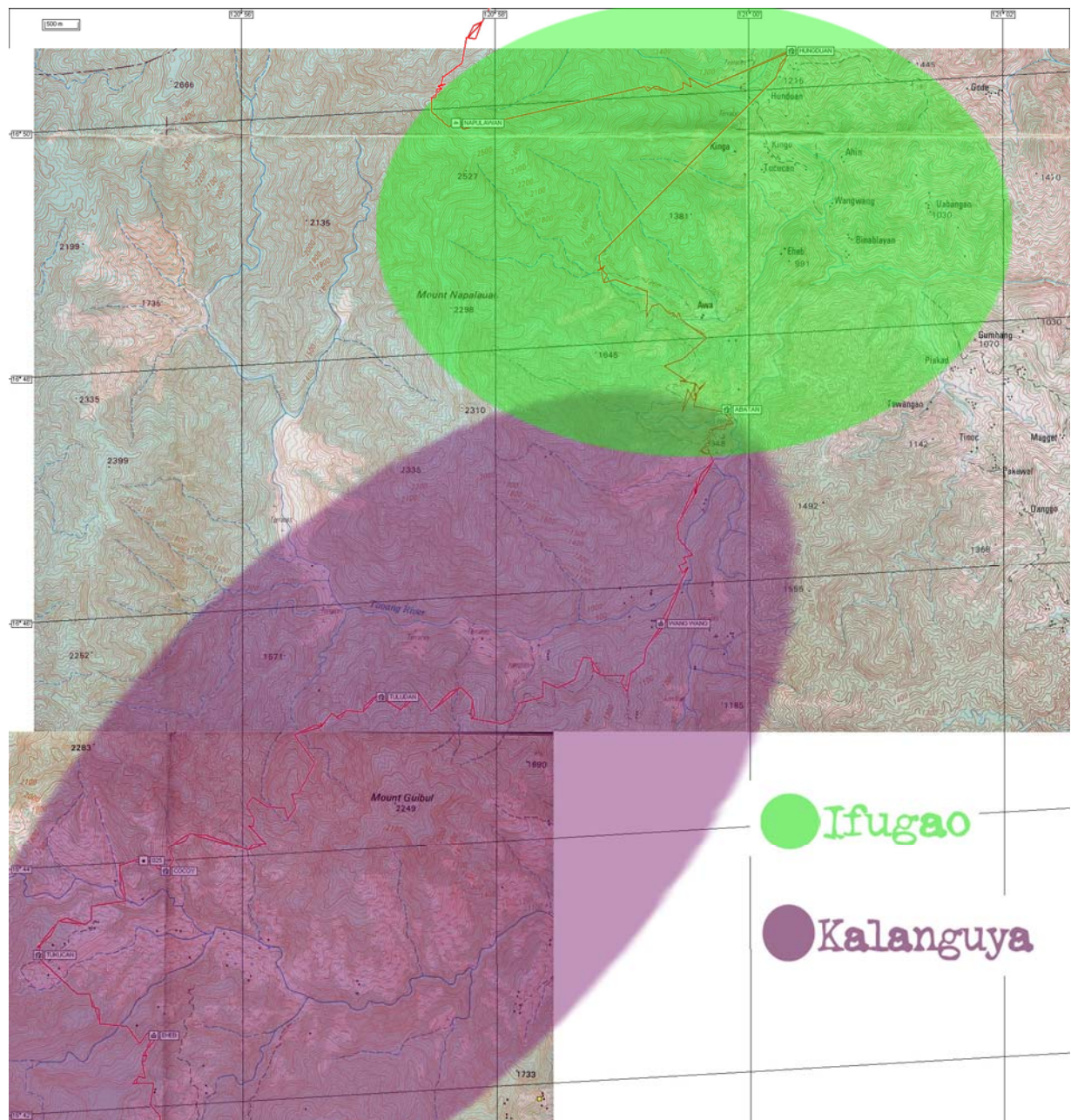


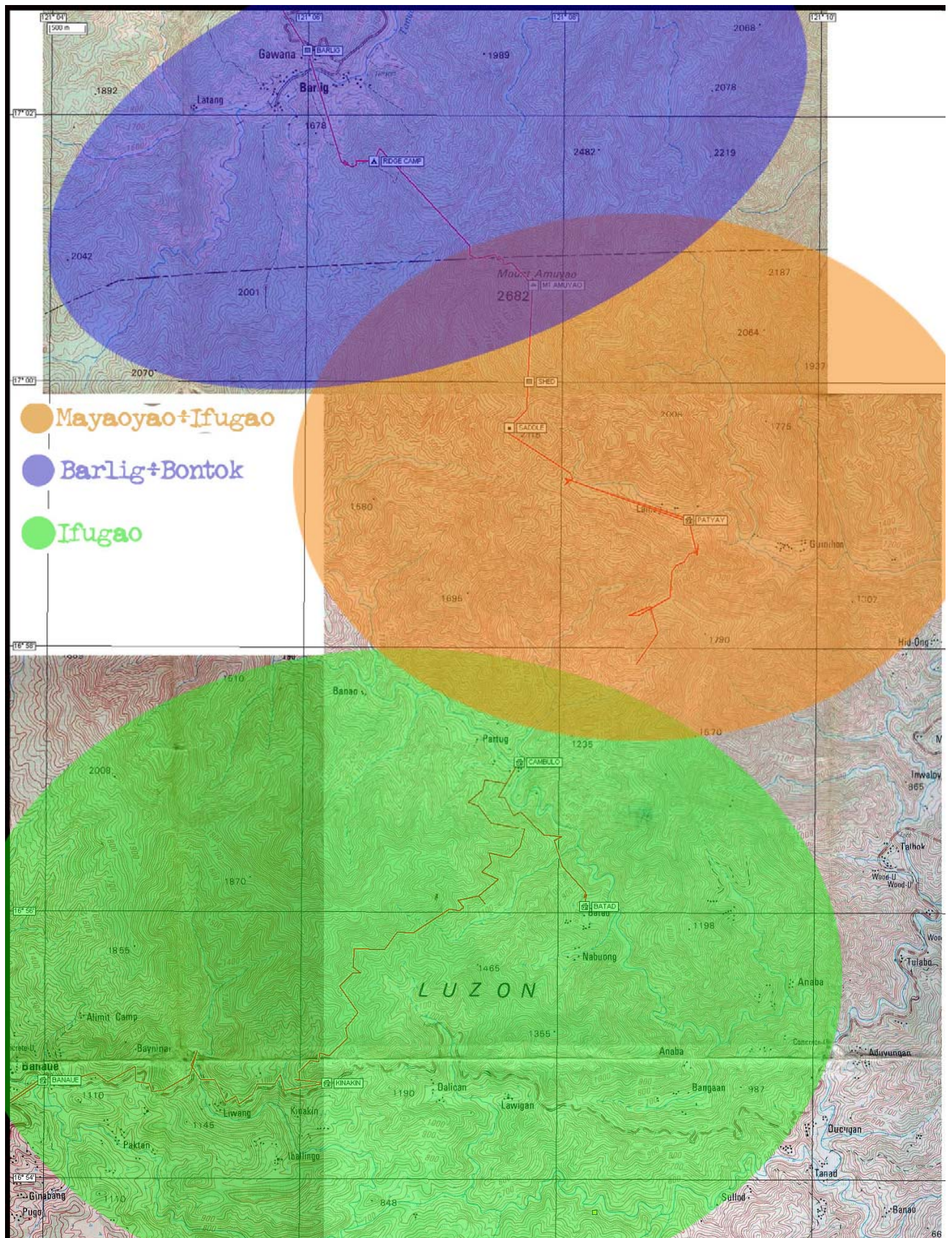
Appendix 8:

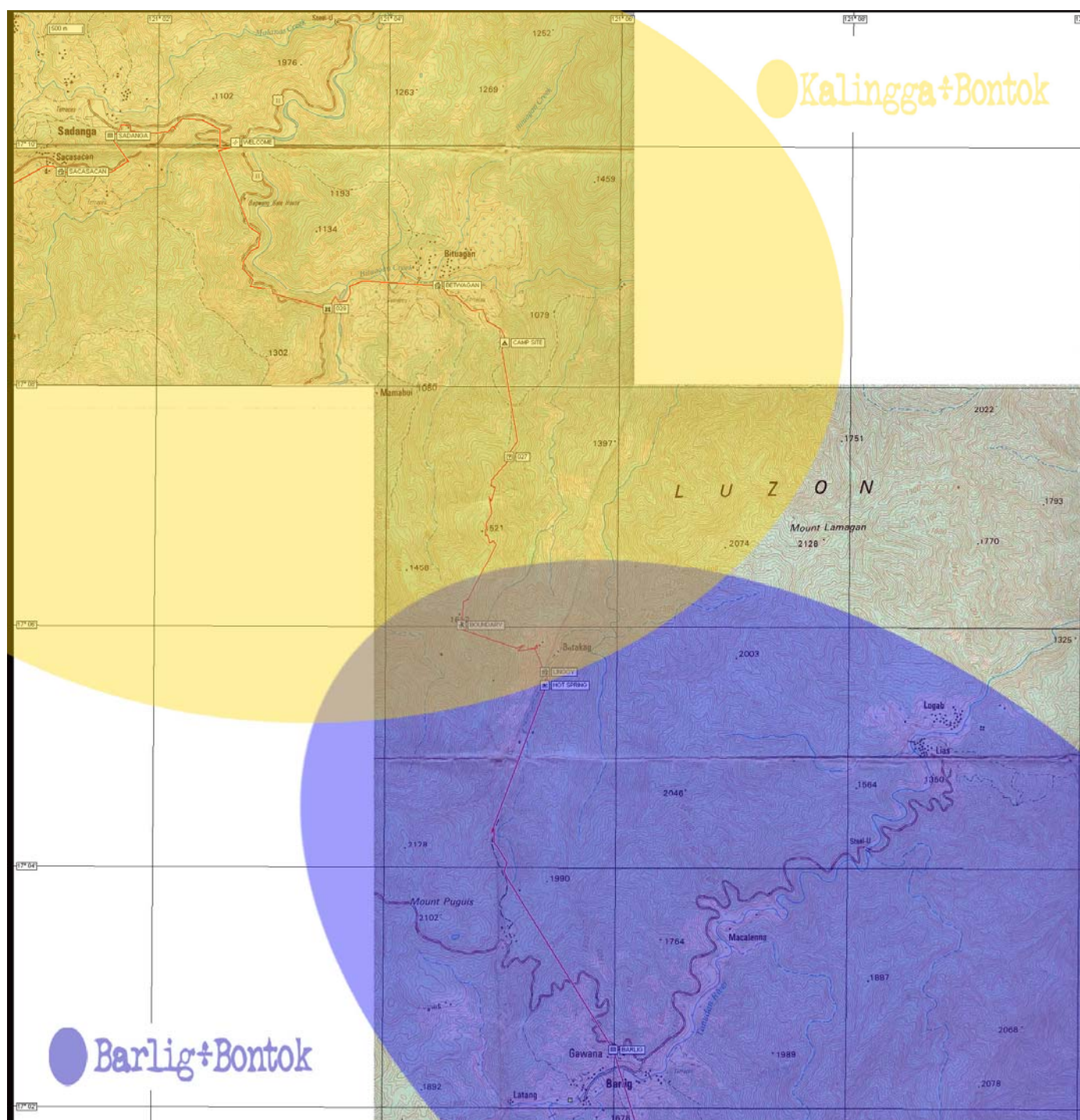
Topographic Maps of the Central Cordillera Region with overlain cultural & trail Data













Appendix 9: GPS Data from Philippine Central Cordillera Traverse

Symbol	Description	Waypoint	Comment	Type	Latitude	Longitude	UTM Zone	UTM Easting	UTM Northing	Elevation
Residence		5		Residence	16.31561	120.7255	51Q	256983.8	1805202	430.0723
Residence		6		Residence	16.31597	120.723	51Q	256710.8	1805245	439.6853
Residence		7		Residence	16.31367	120.722	51Q	256598.6	1804992	470.928
Residence		8		Residence	16.30662	120.7259	51Q	257006.2	1804207	422.1414
Residence		9		Residence	16.30027	120.7348	51Q	257953.9	1803494	402.6749
Residence		10		Residence	16.29481	120.7392	51Q	258413.4	1802883	400.9926
Forest		15		Forest	16.29383	120.778	51Q	262562.8	1802730	1505.539
Residence		16		Residence	16.42752	120.8925	51Q	274956.7	1817398	1950.626
Drinking Water		17		Drinking Water	16.43643	120.8996	51Q	275721.7	1818376	1837.672
Drinking Water		20		Drinking Water	16.54936	120.9533	51Q	281585.3	1830815	1298.136
Building		22		Building	16.58405	120.9424	51Q	280461.9	1834667	1971.534
Waypoint		25		Waypoint	16.73346	120.9203	51Q	278279.6	1851228	1684.343
Information		27		Information	17.12364	121.0842	51Q	296181.4	1894237	1393.786
Truck Stop		29		Truck Stop	17.14404	121.058	51Q	293414.4	1896522	860.259
Scenic Area		32		Scenic Area	17.16594	120.9742	51Q	284525.3	1899037	1592.538
Residence		34		Residence	17.11428	120.8251	51Q	268588.4	1893491	1326.014
Residence		37		Residence	17.14019	120.6161	51Q	246374.1	1896619	508.4192
School	ABAT	ABAT		School	16.52472	120.9423	51Q	280384.9	1828101	1193.594
Residence	ABATAN	ABATAN		Residence	16.79009	120.997	51Q	286517.9	1857412	0
Swimming Area	ABRA RIVER	ABRA RIVER		Swimming Area	17.13715	120.6892	51Q	254158.7	1896189	304.8615
School	AGAWA	AGAWA		School	17.11241	120.8669	51Q	273038.8	1893234	1360.381
Residence	AMBAGIW	AMBAGIW		Residence	17.12025	120.8456	51Q	270775.6	1894127	1301.741
Residence	BALETE	BALETE		Residence	16.55424	120.9542	51Q	281691.4	1831354	1355.575
Residence	BANAO	BANAO		Residence	16.45145	120.9177	51Q	277671.8	1820017	1527.89
Residence	BANAUE	BANAUE		Residence	16.91221	121.0666	51Q	294068.8	1870854	1056.126
Residence	BANGAAN	BANGAAN		Residence	17.11779	120.8964	51Q	276182.6	1893796	1651.898
Residence	BANTIK	BANTIK		Residence	16.26755	120.7632	51Q	260947.9	1799838	1086.408

Building	BARLIG	BARLIG	Building	17.04146	121.0999	51Q	297755.6	1885124	1810.274
Residence	BATAD	BATAD	Residence	16.93408	121.1368	51Q	301571.4	1873203	822.2874
Residence	BESAO	BESAO	Residence	17.08439	120.8652	51Q	272817.8	1890135	1328.177
Residence	BETWAGAN	BETWAGAN	Residence	17.14743	121.0737	51Q	295090.8	1896880	765.5698
Trail Head	BOUNDARY	BOUNDARY	Trail Head	17.10022	121.0776	51Q	295445.5	1891651	1666.799
Residence	CABAYO	CABAYO	Residence	16.47653	120.9165	51Q	277580.1	1822795	1460.357
Residence	CAMBULO	CAMBULO	Residence	16.95232	121.1281	51Q	300673	1875230	934.0396
Campground	CAMP SITE	CAMP SITE	Campground	17.13942	121.0835	51Q	296119.3	1895984	1065.018
City			City						
(Medium)	CANDON	CANDON	(Medium)	17.19259	120.4482	51Q	228583.3	1902648	41.2219
Residence	COCOY	COCOY	Residence	16.73189	120.9232	51Q	278588.1	1851052	1810.274
Residence	DALIC	DALIC	Residence	17.12748	120.9343	51Q	280226.8	1894825	1194.555
Trail Head	DALUPIRIP	DALUPIRIP	Trail Head	16.32592	120.7237	51Q	256797.8	1806346	414.6913
Residence	DANGO	DANGO	Residence	16.59279	120.9659	51Q	282986.7	1835608	1178.453
Residence	DOMOLPOS	DOMOLPOS	Residence	16.32922	120.8221	51Q	267325.3	1806596	1686.025
Residence	DOMOLPOS S	DOMOLPOS S	Residence	16.31357	120.8135	51Q	266381.7	1804874	1716.547
School	EHEB	EHEB	School	16.7097	120.9216	51Q	278391	1848597	1779.513
Swimming			Swimming						
Area	FALLS	FALLS	Area	17.13207	120.901	51Q	276688	1895370	1318.564
Residence	FIDELISAN	FIDELISAN	Residence	17.12464	120.8983	51Q	276396.8	1894551	1458.435
Residence	GDP	GDP	Residence	17.14582	120.6118	51Q	245931.2	1897248	342.1123
Scenic Area	GDP STATUE	GDP STATUE	Scenic Area	17.1423	120.6294	51Q	247800.1	1896836	918.178
Campground	GRASSLAND	GRASSLAND	Campground	16.58403	120.9066	51Q	276638.5	1834705	2675.214
Residence	GULGULUNAN	GULGULUNAN	Residence	16.59661	120.9574	51Q	282079.1	1836040	1513.71
Residence	HANDUPIT	HANDUPIT	Residence	16.34703	120.861	51Q	271495.1	1808523	1850.65
Residence	HAPAO	HAPAO	Residence	16.87267	121.0076	51Q	287748.4	1866541	1015.511
Residence	HOME	HOME	Residence	16.44188	120.5938	51Q	243066.6	1819342	1346.923
Swimming			Swimming						
Area	HOT SPRING	HOT SPRING	Area	17.09192	121.0897	51Q	296725.5	1890720	1350.768
Residence	HUNGDUAN	HUNGDUAN	Residence	16.83841	121.0056	51Q	287492.1	1862751	1175.088
Residence	KINAKIN	KINAKIN	Residence	16.91195	121.1034	51Q	297995	1870787	1081.841
Building	KINIWAY	KINIWAY	Building	17.09532	120.8562	51Q	271875.3	1891355	1400.516
Swimming			Swimming						
Area	LAKE	LAKE	Area	17.12535	120.9239	51Q	279121.8	1894601	1604.074

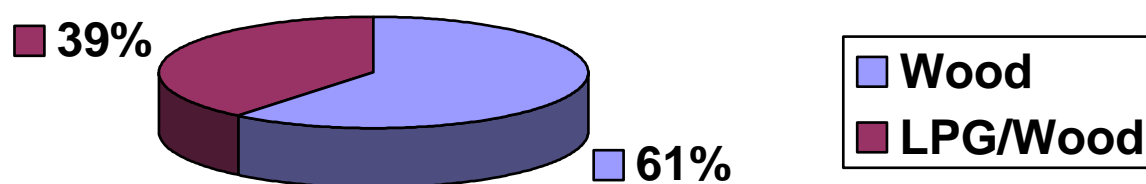
Swimming Area	LAKE DANUM	LAKE DANUM	Swimming Area	17.09441	120.884	51Q	274832.9	1891222	1622.819
Residence	LEBENG	LEBENG	Residence	16.63602	120.9446	51Q	280753.4	1840417	1925.392
Residence	LEGLEG	LEGLEG	Residence	17.13734	120.6782	51Q	252980.3	1896223	320.7231
Residence	LINGOY	LINGOY	Residence	17.09384	121.0896	51Q	296725.5	1890933	1346.682
Residence	MAINIT	MAINIT	Residence	17.15138	120.9549	51Q	282448.5	1897447	1251.032
Summit	MT AMUYAO	MT AMUYAO	Summit	17.01212	121.1295	51Q	300882.7	1881847	2719.915
Summit	MT UGO	MT UGO	Summit	16.31974	120.8031	51Q	265277	1805569	2171.247
Residence	NAAYAW	NAAYAW	Residence	16.41239	120.881	51Q	273709.2	1815736	1602.151
Summit	NAPULAWAN	NAPULAWAN	Summit	16.83126	120.9615	51Q	282785	1862008	2627.629
Residence	PANGAWAN	PANGAWAN	Residence	16.38002	120.87	51Q	272496.7	1812164	1479.824
School	PANGWEO	PANGWEO	School	17.10766	120.7713	51Q	262856	1892822	643.7236
Church	PATACAN	PATACAN	Church	17.10853	120.7454	51Q	260096.4	1892950	861.2202
Residence	PATYAY	PATYAY	Residence	16.98271	121.1499	51Q	303020.8	1878571	1489.677
Campground	RIDGE CAMP	RIDGE CAMP	Campground	17.0276	121.1087	51Q	298678.1	1883582	1955.192
Residence	SACASACAN	SACASACAN	Residence	17.16297	121.0194	51Q	289324.7	1898659	1256.079
Building	SADANGA	SADANGA	Building	17.16792	121.0264	51Q	290076.8	1899199	902.5566
Waypoint	SADDLE	SADDLE	Waypoint	16.99421	121.1265	51Q	300541	1879868	1699.003
Residence	SAGADA	SAGADA	Residence	17.08459	120.9019	51Q	276726.7	1890114	1547.596
Building	SHED	SHED	Building	17.00006	121.129	51Q	300815.3	1880513	2243.345
Residence	TABU	TABU	Residence	16.28752	120.7421	51Q	258721.2	1802073	399.3103
Residence	TABU L	TABU L	Residence	16.27525	120.7482	51Q	259355.4	1800709	414.9316
Residence	TAMBUWAN	TAMBUWAN	Residence	17.10948	120.8036	51Q	266296.4	1892984	905.2002
Residence	TINOC	TINOC	Residence	16.67789	120.9363	51Q	279920.7	1845060	1494.965
Trail Head	TIRAD PASS	TIRAD PASS	Trail Head	17.14228	120.6378	51Q	248687.3	1896822	1256.8
Residence	TUKUCAN	TUKUCAN	Residence	16.7215	120.9064	51Q	276785.6	1849920	1715.105
Residence	TULUDAN	TULUDAN	Residence	16.75384	120.9515	51Q	281628.5	1853449	1633.874
Residence	ULING	ULING	Residence	16.2726	120.7705	51Q	261734.9	1800388	0
School	WANG WANG	WANG WANG	School	16.76148	120.9884	51Q	285567.4	1854256	1059.25
Drinking Water	WATER	WATER	Drinking Water	17.14117	120.6323	51Q	248107.6	1896706	986.4312
Crossing	WELCOME	WELCOME	Crossing	17.16702	121.0444	51Q	291994	1899080	730.4819

Appendix 10: Fuel Use data for Central Cordillera Settlements

Fuel Use Data for Central Cordillera Settlements

Village/Settlement	Type of fuel used	Latitude	Longitude
ABAT, Kayapa, Nueva Vizcaya	Wood	16.52472	120.9423
ABATAN, Hungduan, Ifugao	Wood	16.79009	120.997
AGAWA, Besao, Mountain Province	Wood	17.11241	120.8669
AMBAGIW, Besao, Mountain Province	Wood	17.12025	120.8456
BALETE, Kayapa, Nueva Vizcaya	Wood	16.55424	120.9542
BANAO, Kayapa, Nueva Vizcaya	Wood	16.45145	120.9177
BANAUE, Ifugao	LPG/Wood	16.91221	121.0666
BANGAAN, Sagada, Mountain Province	LPG/Wood	17.11779	120.8964
BANTIK, Itogon, Benguet	Wood	16.26755	120.7632
BARLIG, Mountain Province	LPG/Wood	17.04146	121.0999
BATTAD, Banaue, Mountain Province	LPG/Wood	16.93408	121.1368
BESAO, Mountain Province	LPG/Wood	17.08439	120.8652
BETWAGAN, Sadangga, Mountain Province	LPG/Wood	17.14743	121.0737
CABAYO, Kayapa, Nueva Vizcaya	Wood	16.47653	120.9165
CAMBULO, Banaue, Ifugao	Wood	16.95232	121.1281
COCOY, Tinoc, Ifugao	Wood	16.73189	120.9232
DALIC, Bontoc, Mountain Province	Wood	17.12748	120.9343
DALUPIRIP, Itogon, Benguet	LPG/Wood	16.32592	120.7237
DANGO, Tinoc, Ifugao	Wood	16.59279	120.9659
DOMOLPOS, Itogon, Benguet	Wood	16.32922	120.8221
DOMOLPOS Sitio	Wood	16.31357	120.8135
EHEB, Tinoc, Ifugao	Wood	16.7097	120.9216
FIDELISAN, Sagada, Mountain Province	LPG/Wood	17.12464	120.8983
Gregorio Del Pilar, Ilocos Sur	LPG/Wood	17.14582	120.6118
GULGULUNAN, Kabayan, Benguet	Wood	16.59661	120.9574
HANDUPIT, Kayapa, Nueva Vizcaya	Wood	16.34703	120.861
HAPAO, Hungduan, Ifugao	LPG/Wood	16.87267	121.0076
HUNGDUAN, Ifugao	LPG/Wood	16.83841	121.0056
KINAKIN, Banaue, Ifugao	LPG/Wood	16.91195	121.1034
KINIWAY, Besao, Mountain Province	LPG/Wood	17.09532	120.8562
LEBENG, Tawangan, Kabayan, Benguet	Wood	16.63602	120.9446
LEGLEG, Quirino, Ilocos Sur	Wood	17.13734	120.6782
LINGOY, Barlig, Mountain Province	Wood	17.09384	121.0896
MAINIT, Bontoc, Mountain Province	LPG/Wood	17.15138	120.9549
MT AMUYAO Repeating Station	Wood	17.01212	121.1295
NAAYAW, Kayapa, Nueva Vizcaya	Wood	16.41239	120.881
PANGAWAN, Kayapa, Nueva Vizcaya	LPG/Wood	16.38002	120.87
PANGWEO, Besao, Mountain Province	Wood	17.10766	120.7713
PATACAN, Quirino, Ilocos Sur	Wood	17.10853	120.7454
PATYAY, Mayaoyao, Ifugao	Wood	16.98271	121.1499

SACASACAN, Sadangga, Mountain Province	LPG/Wood	17.16297	121.0194
SADANGA, Mountain Province	LPG/Wood	17.16792	121.0264
SAGADA, Mountain Province	LPG/Wood	17.08459	120.9019
TABU, Itogon, Benguet	Wood	16.28752	120.7421
TABU Downstream settlement	Wood	16.27525	120.7482
TAMBUWAN, Besao, Mountain Province	Wood	17.10948	120.8036
TINOC, Ifugao	LPG/Wood	16.67789	120.9363
TUKUCAN, Tinoc, Ifugao	LPG/Wood	16.7215	120.9064
TULUDAN, Tinoc, Ifugao	Wood	16.75384	120.9515
ULING, Itogon, Benguet	Wood	16.2726	120.7705
WANG WANG, Tinoc, Ifugao	Wood	16.76148	120.9884



Appendix 11

Leading Causes of Mortality and Morbidity: CAR. 2004

Leading causes of mortality

1. Cardiovascular 1562
2. Pneumonia -896
3. Cancer 571
4. Accidents 264
5. Homicide 162
6. Peptic Ulcer 152
7. Diabetes Mellitus 131
8. Kidney 93
9. Senility 93

Morbidity

1. Acute respiratory infection – 61152
2. Bronchitis 34845
3. Pneumonia 30663
4. Influenza 22188
5. Diarrheas 17592
6. Hypertension 15451
7. Acute Tonsillopharyngitis 8056
8. Parasitism -7257
9. Asthma 6718
10. Wounds 5932

Appendix 12
Selected Photos of the Central Cordillera Region



