

Options for Payment Mechanisms under National REDD+ Programmes



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Acronyms and Abbreviations

ANSAB	Asian Network for Sustainable Agriculture and Bioresources
CFUG	Community forest user group
COP	Conference of the Parties
FCTF	Forest Carbon Trust Fund
FECOFUN	Federation of Community Forest Users, Nepal
HKH	Hindu Kush Himalayan region
NORAD	Norwegian Agency for Development Cooperation
PES	Payment for ecosystem services
REDD	Reducing Emissions from Deforestation and Forest Degradation
UNFCCC	United Nations Framework Convention on Climate Change

Introduction

Background

Reducing Emissions from Deforestation and Forest Degradation (REDD), an international mechanism under negotiation among the Parties of the United Nations Framework Convention on Climate Change (UNFCCC), is designed to provide compensation to governments, communities, companies, or individuals in developing countries for actions taken to reduce emissions from deforestation and forest degradation. At the UNFCCC Conference of the Parties (COP) 16 in Cancun, REDD was expanded to REDD+ by recognizing five eligible forestry actions for implementation in developing countries that take into account their national capabilities and circumstances, including:

- reducing emissions from deforestation;
- reducing emissions from forest degradation;
- conservation of forest carbon stocks;
- sustainable management of forests; and
- enhancement of forest carbon stocks.

When this policy is adopted, forestry sectors in developing countries will be eligible to receive carbon credit payments from developed countries for reductions in carbon dioxide emissions either through a carbon market or through special funds. Through national REDD+ programmes, groups actively engaged in forest management, like community forest user groups (CFUGs), will be given the opportunity to partake in global REDD+ finance.

As a performance-based mechanism, REDD+ is introducing a new international paradigm in forest management by tying economic incentives to the outcomes of forest management. In REDD+ finance, developed countries will provide payment to developing countries that successfully increase carbon stock in forests either by reducing emissions or sequestering carbon, thereby reducing the atmospheric concentration of carbon dioxide. By promoting activities that stimulate any of the five additional REDD+ activities and by showing increases in carbon stock relative to a national reference scenario or baseline, governments in developing countries may access carbon finance from international sources. But payments to developing countries will only be given after carbon accounts are verified and certified by an independent third party.

Although the use of performance-based REDD+ payment models at the national level will not be mandatory, many countries are planning to replicate this approach. These incentive-based mechanisms are attractive to governments because they enable governments to transfer the costs of environmental protection to the polluters (in this case, developed countries that emit excess carbon dioxide). However, there are many preconditions for this type of mechanism to be successful. For example, payments should be greater than the costs of conducting REDD+ activities, and a mechanism must be in place to ensure that funds are transmitted to the populations involved in REDD+ activities on the ground. There are a number of ways that national payment mechanisms can be set up to ensure this.

Although the implementation modality of REDD+ finance mechanisms at the international level is yet to be decided, there is an urgent need for forestry sector stakeholders to take cognizance of emerging REDD+ instruments. It is clear that international REDD+ programmes will be directed at countries as a whole, but, just as participation in forest management by CFUGs is voluntary, the ultimate decision of whether a community participates in national REDD+ programmes should be its own. To make this decision, communities must be aware of the potential conditions of REDD+ projects and payments: the amount they would be paid, on what basis, in what form, and when payments would be made. In order to adopt a fair and efficient system that protects the rights of indigenous and local communities, forestry stakeholders must understand the different modes in which REDD+ payments could reach the real custodians of forests.

Carbon Payment Options

Under the proposed international REDD+ policy, payments will be made at the national level based on annual carbon reduction relative to a national forest emissions baseline. Whether this includes below-ground vegetation and soil carbon in addition to above ground carbon is still to be decided. What is clear is that payments will be output related (i.e., per tonne of reduced carbon emissions or increased carbon sequestration). In this system, which is typical of most voluntary carbon market projects, carbon is treated as a tradable commodity, and the payment system is transparent and intended to provide direct incentives for promoting effective forest management. In the international REDD+ system, performance will be evaluated at the national level: only overall carbon reduction is rewarded, regardless of if a country loses carbon in one area but gains in another. This means that within the country, leakage – when forest destruction is shifted – is unlikely. This is in contrast to Small Scale Afforestation Clean Development Mechanism and Voluntary Carbon Sector projects, which reward individual gains and often result in some level of leakage, although a certain amount of leakage is accounted for in payments.

Under national REDD+ programmes, governments will be free to make payments to forest managers in whatever manner they feel is most appropriate, not necessarily through a performance-based system. National governments will be dealing with an array of internal projects as a number of different groups manage different parts of the national forest estate. Most governments have proposed some kind of system for payment for ecosystem services (PES), but they should think carefully about how payments to forest managers will be made, taking into account the reality that:

- depending on the dates used to determine the national baseline, communities that have been engaged in forest management for several years may be at a disadvantage because they will not be able to contribute significant amounts of additional carbon savings at the national level, but are effectively a part of business as usual;
- contributions to national carbon funds by the international community are based on the national balance of gains and losses, thus communities successfully reducing carbon will subsidize areas which have gained carbon; and
- costs of payment transactions may be higher under some payment systems than others, affecting the amount paid to communities.

These three realities call the use of an output-based payments system at the local level into question, and suggest that alternatives should be considered. Alternatives by which the national government can make payments to those responsible for the management of a particular forest unit can be characterized into four major types: output-based systems; input-based systems; opportunity cost-based systems; and payments for monitoring.

It must be noted that the division of payments between members of forest management groups could lead to internal conflicts and difficulties. In addition, there are numerous problems facing communities forest managers such as the ancient rights of nomadic and transhumant groups who, by custom, graze their livestock in forests. These are not negligible challenges; however, since they arise regardless of the basic architecture of the payment system, they are not addressed in this paper.

Output-based system

In an output-based system, registered forest managers (e.g., CFUGs) are paid, after verification, on the basis of the tonnes of carbon emissions reduced and/or tonnes of carbon sequestered during the period of the agreement (most likely five years) in comparison to baseline figures. For a true incentive-based system, results would have to be evaluated against baselines specific to local management units. In principle, the sum of local baselines would make up the national reference level. This means that carbon accounting at the local level could link directly to the national accounting system and could provide direct incentives for good performance.

In this system, payments are made on any increase in carbon stock, regardless of the means taken to achieve this increase. This gives forest managers a great deal of freedom in how they reduce emissions and increase carbon

sequestration. Another advantage of output-based payment systems is that they are transparent in terms of the distribution of payments for ecosystem services between forest management units. However, there are a number of disadvantages.

This system requires a detailed monitoring infrastructure (i.e., accurate measurements of changes in carbon stock will be required for each forest parcel) and involves a complicated payment system in which each forest manager may receive a cheque for a different amount, making the costs of both verification and local transactions high relative to other REDD+ payment systems. Also, simply paying on the basis of carbon stock maximization in the short term (usually five years) will not guarantee the long-term sustainability of carbon stocks. This approach could encourage the maintenance of larger trees, which have a higher carbon stock value, rather than young saplings, which could threaten forest health and carbon stocks in the long run.

Another challenge in an output-based system is deciding who is eligible to participate. For forest managers who have been enhancing the health of their forest for several years to contribute significant additional emission reductions, they would have to further increase their rate of forest enhancement, which can be difficult in healthy, mature forests. One alternative would be to confine REDD+ payments to geographical areas under threat of deforestation, if this threat can be consensually defined. In either case, to exclude well-managed forests and reward forest managers who earlier allowed their forests to be degraded, allowing more potential for carbon savings, could be damaging from a public policy viewpoint and might even provide a perverse incentive for good managers to terminate sustainable practices.

In addition, forests in some areas of a country have more growth potential than others due to varying climatic and soil conditions, meaning carbon gains may have less to do with management activities than with natural conditions. A differential reward system in which a tonne of carbon in a slow-growing area would carry a higher value than in a fast-growing area could be considered. But since carbon stock will have a standard value in the international carbon market, it means that one tonne of 'temperate' carbon would be subsidized at the expense of one tonne of 'tropical' carbon, which would require considerable negotiation.

Input-based system

Input or activity-based systems are common in existing PES schemes. Under these programmes, forest managers wishing to participate must apply, and after being accepted must adhere to an established set of forest management rules. Participants receive a fixed payment per hectare of forest they bring under this agreement. Payment levels can be differentiated, with higher payments to communities heavily dependent on forests for their livelihood (which moves in the direction of a payment system based on opportunity costs discussed below). To encourage participation, part of the payment may be made at the beginning with the remainder paid after inspection has shown that the established rules have been followed. The change in carbon stock may be roughly estimated for the purpose of national accounting, but it is not important from the point of view of the forest manager.

This system has very low monitoring and validation costs and a simple financial administration system, but forest managers are obligated to comply with rules as laid down in the initial agreement, restricting their management freedoms. Since it is likely that these rules would reflect a healthy, sustainable form of forest management, this is not necessarily negative.

One disadvantage is that, because the per hectare payment would not represent a direct relationship to the amount of carbon emissions reduced, the relationship between the agreed management actions and any increase in carbon stocks would have to be assumed (Muradian et al. 2010). Such technical uncertainties add to possibilities for variance between intended and actual outputs. There needs to be some functional relationship between changes in carbon stock and payments depending on the type of forest ecosystem and the types of forest management practices employed. At the same time, payments, which could vary considerably between forest units, must be made attractive to encourage the involvement of forest managers.

Opportunity cost-based system

In systems based on opportunity costs, payments are made for not doing something, rather than for doing something. In the case of forest management, this means payments are made for not clearing forests rather than to reward forest users for introducing sustainable management practices. Payments in this system are intended to provide compensation for the stream of revenue that would be lost over the years if forest users maintain healthy forests rather than converting forests into more profitable alternatives (e.g., agriculture, urban development, etc.) or allowing it to degrade. In general, this type of inducement may be more suited to forest property with single owners rather than community-owned land, which is often cleared as the result of decisions made by actors outside the community in collusion with one or a few community members and sometimes completely independently. An exception is when communities use forest land for shifting cultivation in which forests may be cleared for temporary agricultural purposes. In the long term, shifting cultivation of this type could be considered temporary degradation, since there is usually re-growth after the site is abandoned, albeit of a type of vegetation which may not have the same value as the original forest. This type of payment system would be more successful at halting and reversing degradation caused by the exploitation of forest resources than at combating deforestation as most community forest management activities are more focused on changing the nature of activities that degrade the forest rather than fighting deforestation.

The PES system in Costa Rica, which pays individual forest owners a fixed sum per unit area for not converting their forest land, is one example of an opportunity cost-based system, although no differentiation is made regarding the magnitude of the real opportunity costs per forest unit. A more sophisticated approach would be to estimate the value of the most likely alternative use for each section of forest (e.g., clearance for cultivation, sale for urban development, etc.), and make payments to forest managers of an equivalent amount for keeping the forest intact, also allowing for a controlled amount of off-take of forest products like sustainable fuelwood, fodder, and collected foods for local needs (Karky 2008). From a market economics point of view this would be the most efficient payment system and should result in the lowest average price for carbon stock as far as the developed countries are concerned. Land owners and communities whose opportunity costs for clearing the forest can be met by carbon rewards of not doing so will likely participate, and the carbon price could be set at a level which would bring about the desired level of conservation. However, surveying and estimating opportunity costs for each forest parcel will prove difficult and the likelihood of extended negotiations would mean considerable monitoring and transaction costs.

Payment for monitoring

For a REDD+ system to function, data on changing carbon stock is essential. One way to effectively and cheaply obtain this data is by requiring communities to conduct simple forest inventories on a regular basis (Skutsch 2011). But communities cannot be expected to do this work for free (in a forest of 100 hectares, a team of five people would have to spend five days doing an annual inventory). Another possible national REDD+ payment mechanism would be to pay communities for taking carbon measurements rather than for carbon reduction through proper forest management. In this system there is no direct incentive for improved management, although payment could be restricted to those communities who agree to take part in a sustainable forest management programme. Advantages of this approach include increased equity between forest user groups since the payment is not determined by the natural potential of the forest and equal opportunities for communities who have been practising good forest management and are only able to make small increases to carbon stock. Moreover, data is likely to be more accurate as there is no reason for communities to exaggerate carbon gains since they will be paid the same regardless of the measurement. However, payments to individual communities, which would be based on the number of sample plots taken, would be relatively low since the international funds would be spread over a larger number of communities (i.e. areas that lose carbon would be paid along with those that gain carbon). As data is required from all forest areas, even those losing carbon, this may be an effective approach. It has been suggested that payment for monitoring may be a better option than paying for inputs, outputs, or opportunity costs (Skutsch et al. 2011).

Table 1: Advantages and disadvantages of payment models

Payment model	Government Point of View		Community Point of View ¹	
	Advantages	Disadvantages	Advantages	Disadvantages
Output-based payment	Provides incentives to maximize carbon production Clear, rational basis for payment Links immediately to international market systems	Heavy overhead costs Political difficulty of giving those who have earlier allowed forest to an advantage degrade over those who have practised good forest management.	Managers of degraded forests with carbon potential/room for growth could earn well	Managers of healthy forests with less potential/room for growth will not be able to earn well Potential for conflict between communities
Input-based payment	Easy to manage, lower overhead Transparent, less susceptible to corruption or fear of corruption	Not a strong incentive for performance-based management and carbon reduction	Allows a more holistic approach, carbon not the most important output Fixed, known payment, less uncertainty	Lower average price per tonne or per hectare Not a major incentive to richer communities
Opportunity cost-based payment	Cheapest (most cost effective) model, in theory	Difficult to accurately assess opportunity costs in every community High transaction costs Susceptible to corruption	Poorest communities have the lowest opportunity costs hence best chance with this model	Richer communities with possibilities of timber extraction would not participate
Payment for monitoring	Easy to pay, (based on number of sample plots surveyed, standard rate for whole country) Transparent system Likely to produce more accurate data	Does not provide a strong incentive for increased carbon reduction	Communities would all benefit regardless of carbon gains or losses	Payment level would be relatively low since both areas with carbon losses and those with gains will be paid Risk that those involved in measurement would seize funds

¹ There is always potential for conflict within communities. The goal is equitable sharing of payments, but this is difficult to achieve as some households may have less interest in forest management than others as a result of their particular livelihood strategies and sources of income. However experience with sharing of the costs and benefits within CFUGs in Nepal has been good and this kind of group arrangement might form a good basis of REDD+ project management and sharing of benefits.

REDD+ Pilot in Nepal: One proposed payment system

As Nepal's REDD+ programme is being fully developed, a pilot project is being implemented in three watersheds (see Annex 1). For this, a REDD+ payment mechanism is being developed for the community forest management system. The proposed design is performance-based but takes equity issues and benefit sharing into account. REDD+ compensation is determined by performance-based forest management, so payment should be quantitatively related to the enhancement of carbon stock resulting from sustainable management practices by local communities.

In the global REDD+ debate, respecting and ensuring the rights of indigenous people and local communities as well as the equity between different socioeconomic groups and gender are maintained in the distribution of REDD+ benefits are of great concern. In the pilot watersheds, the area of community forests do not correspond to household sizes or population in the project sites. For example, the area of forest per participating household ranges from 0.5 hectare to 0.8 hectare. Also, ecological and climatic variations, the age of the forest, as well as the growth rate of different tree species may result in differences in potential biomass enhancement within the study areas, even with similar levels of labour input. Thus, the growth of carbon stock and the potential for economic benefits are unequal between different forest areas.

In order to address these equity-related concerns, the REDD+ pilot project in Nepal is utilizing a system in which payment is made for performance in combination with social criteria. Payment levels are decided through a function of six basic elements: forest carbon pool, change in forest carbon, number of households of indigenous peoples, number of Dalit households, the ratio of men to women, and the population of poor people. The criteria of payment and the corresponding weight given to each attribute is shown below:

$$\begin{aligned} \text{Payment} = & f [\text{forest carbon pool (24\%)} + \\ & \text{change in forest carbon (16\%)} + \\ & \text{number of households of indigenous people (10\%)} + \\ & \text{number of Dalit households (15\%)} + \\ & \text{population of women (15\%)} + \\ & \text{population of poor people (20\%)}] \end{aligned}$$

Each CFUG is responsible for categorizing member households into different strata according to a set of standard indicators including household status, the ratio of men to women, and data on indigenous people. This information, along with forest carbon data, would be forwarded to the Watershed REDD Network, the sub-national institution responsible for implementing the project. The Watershed REDD Network then compiles the data and makes payment claims to a multi-stakeholder board at the national level. Based on reviews and recommendations from the national technical committee, funds are disbursed to the Watershed REDD Network. Fund distribution committees at the watershed level follow a similar process to distribute payments to CFUGs. After REDD+ payments reach individual CFUGs, each group would be allowed to choose how to invest their money within guidelines that are intended to ensure the maximum utilization of payments. In principle, REDD+ funds should be expended following a consensual plan and should be limited to REDD+ activities, forest carbon inventory, capacity building of CFUGs, and poverty reduction and social inclusion activities.

The finance mechanism developed for this pilot project demonstrates that in order to address equity concerns and implement social safeguards, 60 per cent of the REDD+ payment must be based on socioeconomic criteria while 40 per cent of the payment should be based on the level of forest carbon enhancement. Reducing poverty and enhancing livelihoods are a requirement while reducing emissions. If REDD+ payments are not regarded as incentives for local communities to reduce emissions through deforestation and forest degradation, they lose their purpose. Similarly, if poverty is not reduced, incentives for conservation alone will not suffice. Finding incentives that encourage performance-based forest management while improving the livelihood options of the poorest members of the community is necessary for successful and effective REDD+ implementation.

Although the pilot REDD+ project in Nepal has implemented a modified output-based payment system that takes equity considerations into account, the effectiveness of this model on the ground is yet to be determined. However, it is clear that for the nation to benefit from carbon credits, communities must be paid a fair share for activities that increase carbon stock.

Evaluation of Payment Options

In the Hindu Kush Himalayan (HKH) region there is a strong tradition of unpaid community forest management. In areas where the market for timber is not strong, outside financial incentives are not necessary to persuade communities to take care of their forests and allow them to regenerate (Karky and Skutsch 2010). As several studies have shown, the main benefits of good forest management for communities are an improved stock of forest products necessary for their daily subsistence – fuelwood, fodder, leaf litter, etc. What makes community forestry effective is the value of these important items to the population, the small-scale management (at the sub-village level) which removes it from the political arena, and the acceptance among these small groups of a set of rules about off-take of forest resources, which they can monitor themselves. In these cases, it is unlikely that an output-based payment mechanism will act as an incentive for improved management and increased carbon reduction and sequestration.

A flat rate per hectare, paid to all CFUGs that achieve a minimum increase in carbon stock would be the simplest way to ensure that communities working to improve the national carbon stock would be compensated. This would not be tied to each group's actual carbon savings but would reflect an average increase in national carbon stock. If necessary, this could be adjusted to take into account special equity considerations adopted in the equation above.

Another alternative would be to pay communities for monitoring on an annual basis, which will help in collecting the detailed data on carbon stock changes the government needs to make carbon claims internationally. Communities with larger forests would have to do more monitoring than those with small forests, but if paid on the basis of the number of sample plots, this would be equitable. The amount paid to community forest groups would not be related to the amount of carbon reduced, but would reflect an average national carbon savings and would spread international carbon credit income across all participating communities.

However, if payments are made solely for measurements, there is a danger that those trained to take the measurements within each CFUG will keep the money for themselves. This might cause friction as it is contrary to the current principles of community forest management where outcomes of good management are shared in the community. To ensure more equitable payments, a minimum payment could be made to all community forest group members, and by-laws could be introduced that mandate that the position responsible for (and paid for) monitoring would be held on a rotation basis.

The best option may be a hybrid system that takes advantage of the merits of each payment system. For example, making payments for monitoring, but adding a small bonus based on the value of management activities undertaken or for every tonne of carbon saved. This payment would be in addition to the real costs of monitoring, which should be made to all communities regardless of whether their stocks increase or decrease.

Conclusion

As the global discourse on REDD+ continues, it is necessary for governments, civil society organizations, and forestry stakeholders at and below the national level to build their understanding of REDD+ policy mechanisms without waiting for a global agreement. There is increasing pressure on forest resources from globalization and other factors; at the same time, conservation finance is attracting less attention. There is an urgent need for governments and forestry stakeholders to explore different payment mechanisms in order to devise a policy instrument that can simultaneously reduce global emissions while contributing to performance-based forest management at the local level with additional benefits like biodiversity conservation, poverty reduction, and promoting ecosystem-based adaptation strategies on the ground. There is no one-size-fits-all approach and consequently, governments and stakeholders have to come up with payment mechanisms suitable to their own context. The HKH region is ecologically and culturally diverse, resulting in significant differences between forest regimes. National REDD+ payment mechanisms must work within a framework that features several different forest management policies.

Different payment mechanisms should be tested in pilot projects to evaluate the advantages and disadvantages of each practice. Possible payment systems for the three pilot watershed areas include the following:

- A system in which CFUGs are required to monitor their carbon stock changes over time but are paid on the basis of increases in carbon stock, with some adjustments to reflect equity considerations (i.e. the model originally proposed by the project). Payments will be delayed until increases in carbon stock have been measured and verified, which could take at least three years.
- A system in which CFUGs are required to monitor their carbon stock changes over time but are paid an annual flat rate per hectare provided they have undertaken agreed management activities (including passive activities such as preventing cattle from grazing in the forest, etc.). This system could also be adjusted to take equity considerations into account. Payments will be made on an annual basis after evaluation.
- A system in which CFUGs are paid for monitoring at a rate that reflects the work involved in measurement plus a small bonus. Payments will be made annually after communities submit their data.

Careful comparisons should be made to test which pilot payment system is most effective and most practicable. The primary criteria to be used in comparing the outcomes in the three different pilot areas could be:

- evidence that the CFUGs have adjusted their normal forest management activities as a result of payments or the promise of payments, and whether this has positively or negatively affected carbon stock;
- differences in the relative transaction costs of distributing REDD+ payments;
- reliability of the data measured by the communities (would require confirmation by an independent expert); and
- general satisfaction of CFUGs.

Finding a payment option that simultaneously reduces carbon emissions and provides livelihood options for forest communities would be the most meaningful and sustainable REDD+ mechanism. Motivations for good forest management have little to do with carbon; CFUGs manage their forests to ensure the availability of vital forest goods, e.g. fuelwood and fodder.

This pilot project offers a unique opportunity to assess the benefits of different payment systems in areas where community forest management is well-established. The results of such an experiment could provide important lessons to other regions and countries struggling to design their own national REDD+ programme.

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Annex 1: REDD+ Pilot Project in Nepal

In preparation for REDD+, ICIMOD received funding from the Norwegian Agency for Development Cooperation (NORAD) under the Climate and Forest Initiative to conduct a pilot REDD+ project to test the effectiveness of a community-based approach. Nepal has a long history of successful community forest management, with approximately one quarter of its forests, mainly in the mid-hills, under such management. Unlike many other countries in which management is entrusted to formal local community governments (village councils, municipal governments, etc.), the forests of Nepal are divided between community forest user groups (CFUGs) at the sub-village level. These groups, which have no other political function, may consist of anywhere from 10 to 50 families. The primary responsibility of community forest management is the implementation of by-laws which allow limited quotas of forest products to be extracted. Additionally, members are obligated to carry out surveillance activities, particularly watching for fires. In most cases, degraded forests have robustly regenerated under this management regime and, as a result, the production of forest goods (e.g., fuelwood, leaf litter, etc.) has increased. One of the unintended consequences of this type of management is an increase in carbon stock. Under an international REDD+ policy implemented through national REDD+ programmes, these carbon stocks could be traded in an international market such that carbon could be considered an additional non-timber forest product contributing to the livelihoods of rural populations. ICIMOD is working with the Asia Network for Sustainable Agriculture and Bioresources (ANSAB) and the Federation of Community Forest Users, Nepal (FECOFUN), a national NGO that promotes the interests of CFUGs, on the design and implementation of the REDD+ pilot project in Nepal.

The pilot project is being carried out in three watersheds: Charnawati in Dolakha district, Ludikhola in Gorkha district, and Kayarkhola in Chitwan district. These watersheds vary biophysically (Table 1) and differ greatly in size (Table 2), the number of functioning CFUGs, as well as the socio-demographic status of the people involved in the project (Table 3).

Training on assessing forest carbon pools has been provided to the local communities that manage the forest. A manual was developed by ICIMOD, FECOFUN, and ANSAB based on guidelines developed by the Kyoto: Think Global, Act Local (KTGAL) project for participatory forest carbon assessment and monitoring.

Table 1: Physiographic information of pilot watersheds

Name of the Watershed (district)	No. of Village Development Committees (VDCs) and Municipalities within watersheds	Watershed elevation range (masl)	Watershed area (ha)
Charnawati (Dolakha)	5 VDCs and 1 Municipality	835–3,549	14,037
Kayarkhola (Chitwan)	4 VDCs	245–1,944	8,002
Ludikhola (Gorkha)	4 VDCs and 1 Municipality	318–1,714	5,750
Total	13 VDCs and 2 Municipalities		27,789

Source: Land Cover Analysis Report MENRIS 2010; Socioeconomic Survey Report, ANSAB 2010

Table 2: Area of different forest categories in pilot watersheds

Name of the Watershed (district)	Total watershed area (ha)	Total forest area (ha) within the watershed	Total community forest area (ha)	Category of forest within community forest	
				Dense forest area (ha)	Sparse forest area (ha)
Charnawati (Dolakha)	14,037	7,492	5,996	3,899	2,097
Kayarkhola (Chitwan)	8,002	5,821	2,382	1,903	479
Ludikhola (Gorkha)	5,750	4,869	1,888	1,635	253
Total	27,789	18,182	10,266	7,437	2,829

Source: Land Cover Analysis Report, MENRIS 2010

Using this participatory methodology, the total carbon stock in each community forest within the three watersheds has been estimated. The first measurements in 2010 became the project reference scenario; any rise in carbon stock relative to the reference scenario would be eligible to claim payment from the Forest Carbon Trust Fund (FCTF), the payment mechanism established by the project (Table 4). There is no penalty for deforestation, but CFUGs in areas where deforestation takes place would not receive payments.

After carbon data is received and validated, the FCTF entrusts the carbon payment to CFUGs in the three watersheds. Payments were made based on the six criteria as shown below along with the weight given to each category in brackets (Table 5):

- Quantity of forest carbon pool (24%)
- Quantity of forest carbon pool saved above the baseline (16%)
- Number of households of indigenous peoples (10%)
- Number of Dalit households (15%)
- Population of women (15%)
- Population of poor people (20%)

On receiving the payment, there are some criteria for fund utilization. In this pilot project, the criteria for REDD+ fund utilization headings are listed below.

- Activities that reduce deforestation
- Activities that reduce forest degradation promoting alternative energy
- Activities related to conservation of forest carbon stock
- Sustainable management of forest and biodiversity conservation (as used by UNFCCC)
- Activities that enhance forest carbon stock
- Poverty reduction/livelihood improvement activities
- Forest carbon monitoring
- Awareness raising and capacity building on REDD and climate change
- Auditing of FCTF and verification of data

CFUGs in the pilot areas have been investing REDD+ payments into the areas that fall under these criteria, which demonstrates how the pilot project has been addressing equity issues by combining performance criteria with social and economic criteria (Table 6).

Table 3: Socio-demographic information of CFUGs in pilot watersheds

Name of the Watershed (district)	No. of CFUGs	No. of member households	Population	Major ethnic groups
Charnawati (Dolakha)	58	7,870	42,609	Tamang, Chhetri, Brahmin, Thami, Dalit
Kayarkhola (Chitwan)	16	4,146	23,223	Chepang, Tamang
Ludikhola (Gorkha)	31	4,110	23,685	Magar, Gurung, Tamang, Dalit, few Brahmin and Chhetri
Total	105	16,144	89,517	

Table 4: Total level of carbon stock in community forests in pilot watersheds (2010 and 2011)

Name of the Watershed (district)	Area of community forest (ha)	Total carbon stock (2010) (tonnes)	Total carbon stock (2011) (tonnes)	Increase in carbon stock (tonnes)
Charnawati (Dolakha)	5,996.17	1,240,894.72	1,254,961.48	14,066.76
Kayarkhola (Chitwan)	2,381.91	687,046.43	690,349.27	3,302.84
Ludikhola (Gorkha)	1,888	394,718.84	404,740.83	10,021.99
Total	10,266.08	2,322,659.99	2,350,051.58	27,391.59

Table 5: Carbon payment rates

Name of the Watershed (district)	Forest area (ha)	Total carbon pool (tonnes)	Annual change in carbon pool (tonnes)	Total carbon payable (tonnes)	Total CO ₂ payable (tonnes)	Total payment (US\$)	Payment rate per carbon (US\$/tonnes)	Payment rate per tonne CO ₂ (US\$/tonnes)	Payment rate per ha (US\$/ha)
Charnawati, Dolakha	5,996.25	1,240,894.72	14,066.75	300,065.41	1,100,339.87	45,535.00	0.15	0.04	7.59
Kayarkhola, Chitwan	2,381.91	687,046.43	3,302.85	165,419.60	606,593.67	21,905.00	0.13	0.04	9.20
Ludikhola, Gorkha	1,887.54	394,718.84	10,021.99	96,336.04	353,264.26	27,560.00	0.29	0.08	14.60
Total	10,265.70	2,322,659.99	27,391.59	561,821.05	2,060,197.80	95,000.00	0.19	0.05	10.46

Table 6: CFUG activities using carbon payments

Fund utilization headings	Key activities	Level of use	Percentage of received fund		
			Charnawati (Dolakha)	Kayarkhola (Chitwan)	Ludikhola (Gorkha)
Pro-poor activities/livelihood improvement	Income generating activities within the forest (non-timber forest product (NTFP) promotion, etc.)	CFUG			
	Income generating activities outside the forest (goat rearing, vocational skills training, grocery management, etc.)	CFUG	34.0%	35%	31.13%
Forest enhancement activities	Alternative energy schemes (biogas, improved cooking stoves, etc.)				
	Fire management				
	Forest management				
	Grazing management (including grass seedling purchase and distribution)	CFUG	29.6%	40%	27.68%
Capacity development/awareness raising	Training for women and ethnic communities	CFUG			
	Awareness raising and meetings with teachers, women, and Dalits	CFUG			
	Trainings, meetings and workshops on REDD+ for community forest users, school teachers, youth, and women's groups	Watershed	16.9%	10%	19.32%
Forest carbon monitoring and measurement	Measurement and data recording	CFUG			
	Local resource persons and data management	Watershed	11.7%	10%	14.32%
Other activities			7.80%	5%	7.55%
Total			100%	100%	100%



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