

EVALUATING THE RESULTS OF OUR WORK

Inspiring Action Through Education

Climate change education supports community engagement in sustainable forest management and REDD+ in Madre de Dios, Peru

Key messages

1. Education is a critical component of community-based climate change and REDD+ initiatives; it helps ensure that communities receive the knowledge needed to make informed decisions about their natural resources and actively participate in REDD+ actions.
2. The implementation of climate change and REDD+ education must be adapted to local contexts—with regionally appropriate data and information about deforestation patterns and climate change trends—and must take into account varying literacy levels and learning styles through the inclusion of hands-on activities, graphs, and pictures that frame complex terms in an accessible way.
3. The Rainforest Alliance and its partner AIDER developed a community-based climate change education curriculum for members of the Ese'ejá indigenous community in Madre de Dios. The curriculum focuses on increasing community knowledge of local environmental issues, like deforestation, and ways in which communities can address environmental challenges.
4. This effort has increased environmental awareness within the community and led to the implementation of community action projects related to local environmental issues. It has also improved the ability of community members to understand and engage in programs and policies that advance climate change mitigation and forest conservation objectives.

The need for community-based climate education

Education and capacity building are key entry points for engaging rural and indigenous community stakeholders in REDD+ (Reducing Emissions from Deforestation & Forest Degradation, plus forest conservation) objectives, as well as other climate change mitigation and adaptation strategies. Training and education on the impacts of deforestation



Defining education

With regards to this case study, education is considered the deliberate act of providing instruction and sharing information in order to raise awareness of a particular topic, enhance a community's knowledge-base, and provide building blocks towards the practical application of that information.

September 2014

Kassy Holmes,
Climate Change
Coordinator,
Rainforest
Alliance

Claudia Lebel,
NZDZ Project
Coordinator,
Asociación para
la Investigación
y Desarrollo
Integral (AIDER)

Mark Moroge,
Climate Program
Projects
Manager,
Rainforest
Alliance

Carolina de la
Rosa, REDD+
Advisor,
Rainforest
Alliance

Maria Ghiso,
Education
Program
Manager,
Rainforest
Alliance

The Rainforest
Alliance works
to conserve
biodiversity and
ensure sustain-
able livelihoods
by transforming
land-use prac-
tices, business
practices and
consumer
behavior.
www.rainforest-alliance.org

Addressing differences in age, literacy and learning

Approaches to community climate change education should include a suite of dynamic activities that take into account different age groups, learning styles, and literacy levels. Examples include:

- Blending visual, hands-on, individualized learning, and group activities to address differences in learning styles.
- Ensuring that materials include images, maps, and graphs, for those with limited literacy skills, as well as clear, non-technical language, limited text, and accompanying background information to help explain scientific processes.
- Incorporating activities for younger students, such as analyzing leaf shapes, creating drawings and paintings of nature, and participating in plays about the environment.

tion, for example, can help communities make more informed decisions about the future of their forest resources and better engage in discussions about REDD+ actions and policies that may affect them.

Despite the benefits of education, however, there remains a lack of tailored tools and approaches for engaging stakeholders in education and capacity building efforts at the community level.

To address this gap in community-level climate education, the Rainforest Alliance developed a climate change education toolkit aimed at i) fostering knowledge of basic science and climate change concepts, ii) preparing communities to actively engage in REDD+ initiatives, and iii) increasing smallholder and community-level knowledge of actions to mitigate and adapt to climate change. In the community of Infierno, located in the southeastern region of Madre de Dios in Peru, this approach is supporting the uptake of sustainable land management and forest conservation strategies, and it is inspiring a community to better understand the impacts of their land management decisions.

Innovating a climate-community education toolkit for Madre de Dios

In the Ese'jea community of Infierno, nestled within the lush Amazonian forests of Peru's Madre de Dios region, a group of school children from Hermosa Grande—a primary and secondary school—are organizing a tree-planting campaign. They have spent weeks learning about the carbon cycle and the important role of forests in mitigating climate change. They have also learned about sustainable land-use projects that are being implemented in the region, and they have decided to do their part

by planting trees alongside the town's community plaza, one of the main venues for meetings, events and community gatherings.

As part of the USAID-funded, Net Zero Deforestation Zones (NZDZ) Project, the Rainforest Alliance and its local partner, Asociación para la Investigación y Desarrollo Integral (AIDER), are working with these students and their teachers to help them better understand pressing environmental issues within their community, such as severe seasonal flooding due to climate change, deforestation fueled by papaya cultivation, and poor logging practices. They are also examining how community-based responses—including reforestation, the establishment of timber management committees, and strengthened community governance—can help safeguard Infierno's resources for future generations.

The climate change curriculum has the following objectives:

- **Explaining complex terms and issues related to REDD+ and climate change in order to enhance the capacity of community stakeholders to understand the challenges and opportunities that REDD+ represents**

In the Rainforest Alliance climate guide, this is accomplished through hands-on, interactive activities that analyze local deforestation data and trends, and evaluate local climate change impacts. Images and graphs are also used to

Ensuring local relevance

The most important task in designing a locally-based curriculum is to adapt it to meet the needs of community members. The curriculum must resonate with its users and maintain relevance to their lives. Examples of important questions to consider include:

- How will climate change affect the region, and what impacts are community members already experiencing?
- What are the local drivers of deforestation?
- What is the community's resource and land use history?
- What are common ways of sharing information within the community (e.g. storytelling, radio programming, newspapers, etc.) and how could these be utilized to support education efforts?
- What are the literacy rates within the community, and how can non-reading members be effectively engaged?
- Does the educational approach account for varying ages and learning styles?

explain complex terms and address varying degrees of literacy and scientific understanding.

- **Developing strong relationships with local partners and educational institutions to gain their support and input, and to ensure local relevance of materials**

The Rainforest Alliance drew heavily from the expertise of our local partner, AIDER, in order to ensure the local relevance of curriculum materials. As a leading NGO based in Madre de Dios with over 25 years of experience in sustainability and environmental conservation issues, AIDER brought extensive experience and knowledge on how to best meet the educational needs of local communities.

- **Allowing for open discussions and exchanges on topics of greatest interest to the community**

The workshop setting is considered an open forum for discussion. Facilitators assist with leading activities and addressing questions and comments from the group, but the overall structure and flow of educational workshops is fluid and allows time for discussion on topics like carbon monitoring, changes in land management regimes, and payments for ecosystems services that are of interest to participants.

- **Continuously collecting feedback, as well as encouraging teachers and participants to reflect and collaborate on how best to adapt the resources to the needs of their communities**

We understand that teachers know their students best and play a critical role in their lives. As such, we encourage teachers to adapt and modify the climate change curriculum materials if needed, and to share their feedback with us about what works and what needs improvement.

The relationship between forests and climate change

As one of the ten most mega-diverse countries, Peru's forests and natural landscapes are some of the world's most unique ecosystems. Peru contains a vast diversity of ecosystems, including desert, alpine and lowland tropical forests, eight biogeographic regions, three major hydrological basins containing 12,201 lakes and ponds, more than 1,000 rivers, and over 3,000 glaciers.¹ The ecology of Madre de Dios echoes the rich biodiversity of the rest of the country. Located in southeastern Peru, this region includes the Tambopata National

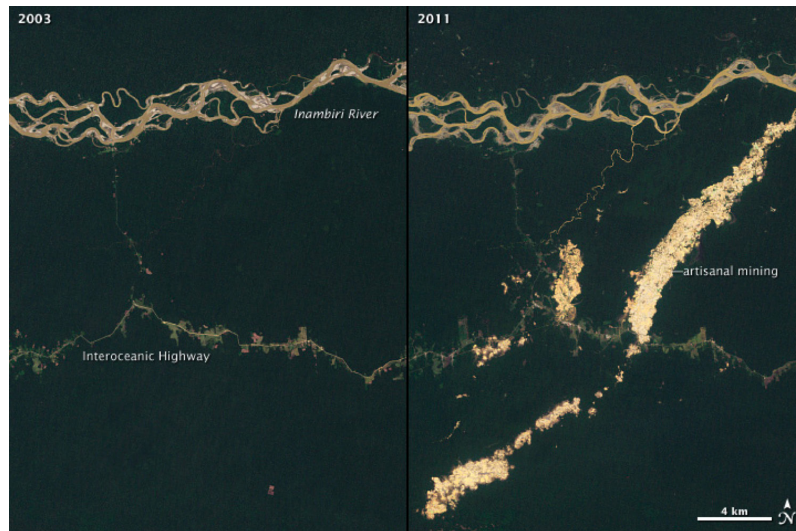


Figure 1
Depiction of deforestation that has resulted from increased mining in the MDD region.

Image retrieved from: <http://visibleearth.nasa.gov/view.php?id=78629>

Reserve, which has an area of more than 270,000 hectares consisting of old-growth Amazon rainforests, native bamboo groves, tropical savannas, and more.² Thousands of plant and animal species, including the endangered giant river otter (*Pteronura brasiliensis*)³, the red brocket deer (*Mazama americana*), the spectacled caiman (*Caiman cocrodylus*), and the threatened South America tapir (*Tapirus terrestris*)⁴ call this place home.

The Ese'je indigenous people live in communities along the Tambopata River, where the Giant River Otter swims, and alongside the buffer zones of the Tambopata Reserve. In the town of Infierno, the Ese'je have lived for generations utilizing nature's resources to cultivate agricultural-based livelihoods and, more recently, eco-tourism. In recent years, however, deforestation has put increased strains on the region's forests and resources.

Nearly half of Peru's total greenhouse gas emissions are a result of deforestation.⁵ This destruction is fueled in large part by the conversion of forest for agriculture and cattle ranching, as well as the development of settlements, illegal logging, and the construction of roads. The rapid expansion of mining in particular, as a result of increases in gold prices, has led to unprecedented deforestation in the region and the subsequent release of noxious mercury which has negatively impacted both the environment and human health.

In an effort to curb these threats and raise awareness among youth about the value of forest ecosystems, the Rainforest Alliance climate change curriculum leads learners through the causes of deforestation and forest degradation in the region and enables opportunities for discussion and

1. <http://www.sernanp.gob.pe/sernanp/contenido.jsp?ID=104>

2. http://www.sernanp.gob.pe/sernanp/archivos/biblioteca/planes_maestros_2012/RN_TAMBOPATA/Plan%202011%20-%202016%20RN%20Tambopata%20ver%20pub.pdf

3. <http://www.iucnredlist.org/details/18711/0>

4. <http://www.iucnredlist.org/details/21474/0>

5. <http://www.minam.gob.pe/programa-bosques/>



Figure 2
The Tambopata
River and tropi-
cal rainforest in
Infierno.
Photo by
Mark Moroge

debate about mining, agricultural expansion, and other deforestation issues. The curriculum aims to build on the unique experiences and perspectives of students in order to collaboratively explore land management and REDD+ issues within the community. Through mapping activities, for example, students learn how to track changes in forest cover and land use within Infierno over time. These maps provide real-world data about stark decreases in forest cover over the last twenty years. The guide also includes a local case study which allows students the opportunity to assess conversation efforts within the Tambopata National Reserve and its impact on the protection of forests in Madre de Dios.

In addition to educating students about local drivers of deforestation and the importance of forests, the curriculum also explores the relationship between forests and the carbon cycle, walking students through creative, hands-on activities that explain what carbon is, what the world's major carbon sinks and sources of pollution are, and why forests are important for mitigating climate change. Students further explore key challenges that the Ese'jea community will likely face as a result of climate change.

Climate change is unfortunately already impacting families and their livelihoods. Throughout January and February of 2014, for instance, the onset of an unusually long, tumultuous rainy season in Peru caused rivers to flood, which ruined crops and altered the phenology of aguaje (*Mauritia flexuosa*, also known as “palm fruit”), thereby reducing the likelihood of a productive, successful harvesting

season. Palm fruit is one of the most popular forest products in the Amazon and is cultivated for a variety of uses. For example, palm fruit oil, which is high in vitamin A, is often extracted and utilized in skin-care products, and the fruit is often used to produce juices and jams.⁶ For families in Peru, sustainable aguaje harvesting provides a viable supplemental income, thereby incentivizing the preservation of palm trees and the lowland forests where they are found.

Through the Rainforest Alliance's climate curriculum, students learn about local threats to the production of this valuable forest product, and how changing climatic conditions will continue to impact their communities well into the future. Additional impacts discussed within the curriculum include:

- **Melting glaciers:** Peru contains 71 percent of the world's tropical glaciers, which serve as critical water resources. In the past 35 years, Peru's glaciers have melted by 22 percent, straining the country's water supply and hydro-electric production.
- **Changes in precipitation patterns:** In some parts of the country, like Madre de Dios and Cusco, there has been an increase in rain while in areas of the South, there has been a noticeable decline. Resulting droughts and floods

6. Palm and Cycad Societies of Australia: http://www.pacsoa.org.au/wiki/Mauritia_flexuosa <http://sinia.minam.gob.pe/index.php?accion>

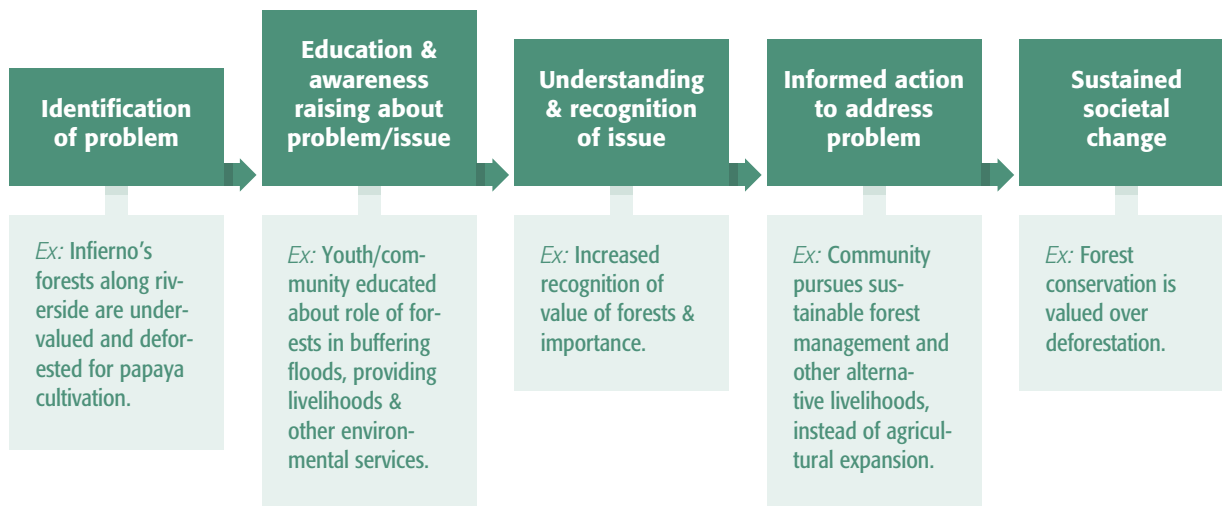


Figure 3
An illustration of the role education plays in informed decision-making and long-term societal changes. In order to maximize their impact, education programs should accompany concrete technical assistance, training and investments in sustainable, alternative livelihoods activities. In this way, education reinforces alternative production activities in a virtuous circle.

Image modified and adapted from:
<http://glen-europe.org/global-education/what-is-global-education/>.

affect farming activities and farmer livelihoods.

- **Increases in the frequency and intensity of the El Niño phenomenon:** Climate change may result in more frequent and severe El Niño events in Peru. These could be similar to the El Niño events of 1982/83 and 1997/98, which resulted in damage to cities and communities and negatively impacted Peru's transportation, agriculture, energy, and education sectors.

Through the lens of the climate change curriculum, students analyze and discuss these trends and begin to obtain a better understanding of the challenges ahead and how they can adapt.

More than 120 teachers and students from grades 1–5 within the Ese'jeja community have been trained using the climate change education curriculum, and the impacts of this education can be found throughout the community. In addition to conducting a tree-planting campaign, these students have initiated several community-based activities to promote forest conservation and sustainability within Infierno: a general awareness raising campaign about environmental issues and the placing of signs throughout the community reinforcing the importance of the forests. Students also organized a waste collection campaign that highlighted the importance of reducing and properly disposing of waste. Enthusiasm and support for the curriculum has led to its increased use; the curriculum will now form part of the general environmental education curricula within local schools, and teachers have committed to training and educating future classes.

Teachers have also integrated lessons and activities from the climate guide into other areas of their teaching. Professor Jorge Ernesto Zamalloa Mendoza for example, is seeing firsthand how the curriculum has helped students learn important lessons beyond those related to climate change. This includes improved biology and math competencies through measuring and evaluating plant species, a greater sense of responsibility through caring for plant seedlings, and increased respect for others

with different customs and backgrounds through working in groups.

Other key local stakeholders are also now beginning to recognize the potential for climate change education to influence behavior. For example, the National Service of Protected Natural Areas (SERNANP), which is part of the Ministry of Environment in Peru, is exploring the possible use of the climate change curriculum as part of capacity building activities related to natural protected areas, climate change mitigation efforts and REDD+. The Tambopata Reserve's communications unit also aims to train professors in the Mazuco region, an informal mining area within the reserve buffer zone. The team hopes that the materials will promote informed discussions about the long-term future of forests and natural resources in the area, and raise awareness about the adverse impacts of gold mining.

Laying the foundation for sustainable land management & engagement in climate policy dialogue

One of the primary aims of the Rainforest Alliance and AIDER's work with the Ese'jeja community is to ensure that community members, and particularly youth, obtain the education and training they need in order to understand the relationships between land management decisions, forest cover and cli-



Figure 4
Students review satellite data of the area around their community to analyze changes in forest cover over time and make predictions about the future.

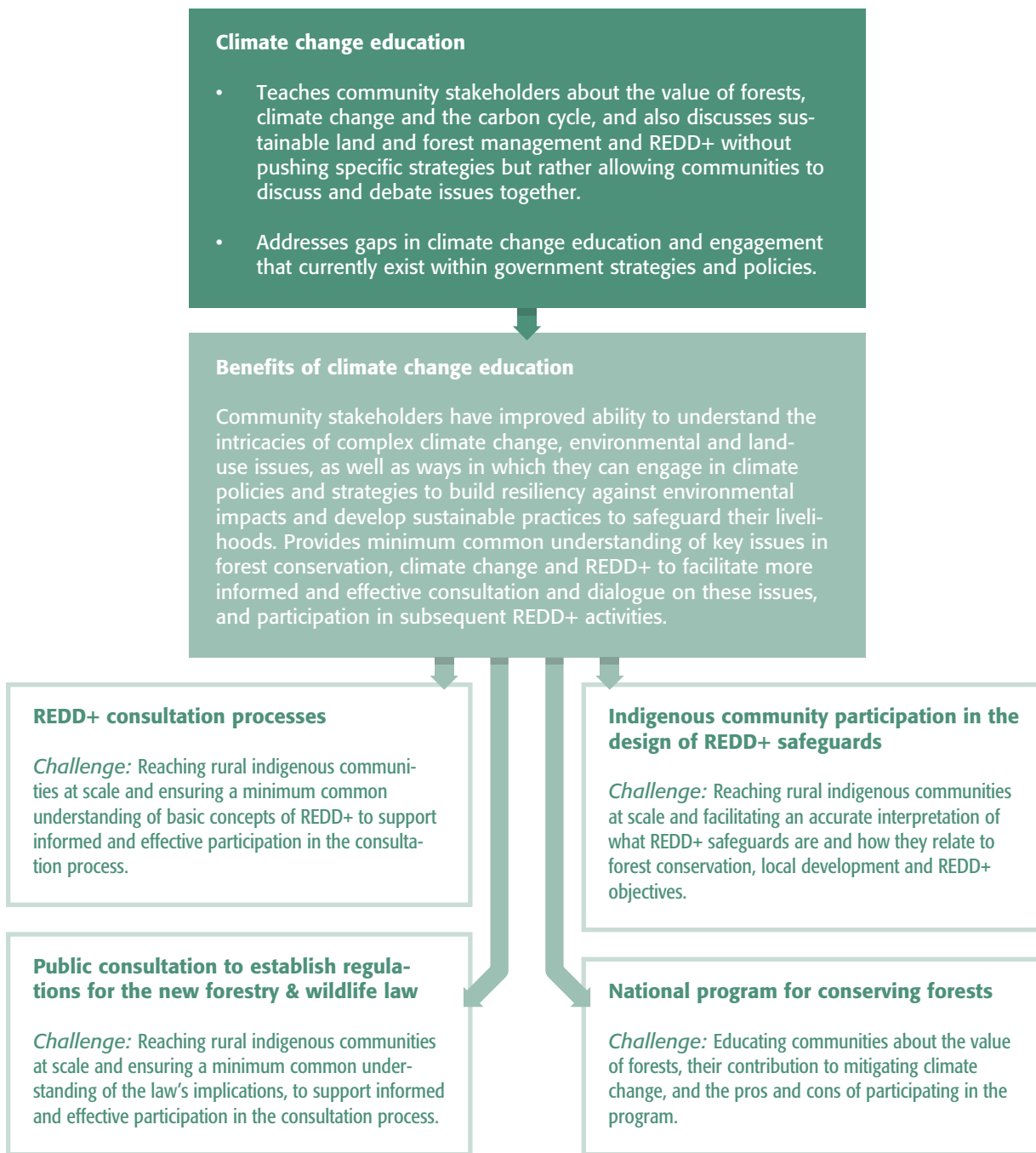


Figure 5
An illustration of how climate change education at the community level can improve the ability of indigenous and community stakeholders to engage in Peru's emerging national policies around REDD+, forests and climate change. Community climate change education addresses some of the challenges related to awareness raising, information sharing and knowledge building that often accompany the processes of effective consultation and participation for complex REDD+ and forest governance legislation and policies.

mate change. Such knowledge provides a foundation for the community's effective and informed participation in public consultations, policy formulation and other multi-stakeholder dialogue spaces, particularly those related to REDD+ and other emerging climate change mitigation programs. As Figure 3 illustrates, education is a crucial first step towards informed action, and in this case, it is a critical component of ensuring that communities can make informed decisions about their land and nature resources.

The curriculum serves to highlight the importance of the environment and ways in which a community's actions can positively or negatively affect the ecosystem around them. In the Ese'eja community, education further promotes a community

environmental ethic—as evidenced by the steady uptake of the curriculum within schools and resulting student-led initiatives focused on environmental issues—and prepares youth to engage in policy and management dialogues on complex issues like land-use zoning and planning, community regulations for timber extraction, and the role of communities in forest carbon monitoring and other payment-for-environmental services schemes.

The curriculum is applied at the local level, and its primary benefits include better understanding and dialogue vis-à-vis forest management and climate change issues. However, the curriculum also supports preparation, effective participation, and consultation of local communities in broader REDD+ consultation and capacity-building work undertaken

by the government of Peru as part of its REDD+ readiness preparation.

For example, under Executive Decree no. 008-2010-MINAN, the National Program for the Conservation of Forests to Mitigate Climate Change, the Government of Peru has committed to protecting 54 million hectares of tropical forests as a means of mitigating climate change.⁷ The efforts of the NZDZ project to educate teachers, youth and parents about the impacts of climate change and the importance of forests promotes an environmental ethic that encourages the conservation of forests and contributes to the goals of this policy.

Climate change education lays a foundation for the Ese'jea community to engage more effectively in emerging policies and strategies around REDD+ and payments for ecosystem services. The Government of Peru's completion of a REDD+ Readiness Proposal Plan (R-PP) is a sign of an emerging strategy to encourage the advancement of REDD+ policies and actions.⁸ As part of this plan, the government commits to ensuring that rural and indigenous communities are an active part of the process of designing REDD+ policies. This commitment embodies the principles of Free Prior and Informed Consent (FPIC), which asserts that communities must be informed about projects that affect their land, and engaged and in agreement with the activities of these projects. However, work remains to ensure that communities understand climate change and REDD+, as well as why forests are important. It is difficult for communities to engage in complex political discussions about their resources without first understanding the basic scientific and environmental concepts at play related to forests, climate change, and REDD+. Community climate change education, as promoted by the Rainforest Alliance climate curriculum, helps to fill this gap and contributes to laying a solid foundation for engaging indigenous groups in REDD+ preparation, in advance of Peru's national REDD+ consultation phase.

Having a basic understanding of the value of forests, in terms of the services they provide to communities and also their economic value, will also prove useful to communities who wish to engage in discussions around payments for ecosystem services (PES). A new law passed in June 2014 aims

to support the development of local, regional and national initiatives that reward actions to protect ecosystems and generate economic, social and environmental benefits to society.⁹ However, additional clarification on how PES will be promoted, developed and incentivized, is lacking. Regardless, having an understanding of the value of trees and the importance of conservation will be helpful for those communities that wish to engage in PES.

Conclusions

Supporting vigorous and informed participation by indigenous and rural communities in dialogue, strategy development and policy design concerning their natural resources is a goal shared by many in the climate change and REDD+ arena. Yet at the local level, many communities still lack access to basic educational tools and materials that explain the complexities of forest management and climate change. The climate change education efforts being undertaken within the Ese'jea indigenous community of Infierno in Madre de Dios, Peru, are one example of how this gap in education can be addressed, and how education can help communities make better informed decisions about their forests and resources, as well as lay the foundation for sustainable land management.

The Ese'jea community has benefited from its adherence to a community-based educational approach that provides opportunities to analyze and discuss local deforestation and climate change challenges, as demonstrated by its actions to promote forest conservation. These localized educational efforts can also positively impact broader regional and national goals related to forest conservation and initiatives for payment for environmental services. We encourage national stakeholders to consider how experiences and lessons learned from the community-based climate change education approach in Madre de Dios can be leveraged to inform and prepare indigenous communities for effectively participating in forthcoming public consultation processes on REDD+, the Forestry and Wildlife Law, and other climate-related policies. We also believe this approach could contribute to enhancing community dialogue and decision-making concerning natural resources, development alternatives and the opportunities and constraints presented by REDD+.

7. <http://sinia.minam.gob.pe/index.php?accion=verElemento&idElementoInformacion=378&idformula=>

8. <http://forestcarbonpartnership.org/sites/fcp/files/2014/February/R-PP%20Per%C3%BA%20Final%20Dec%202013-RESALTADO.pdf>

9. <http://www.minam.gob.pe/notas-de-prensa/conoce-como-functiona-larecien-aprobada-ley-de-servicios-ecosistemicos/http://www.sernanp.gob.pe/sernanp/contenido.jsp?ID=104PP>

