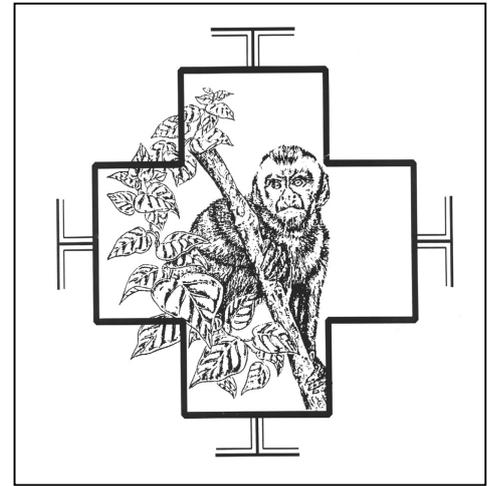


TReeS News No.75

June 2015



The TReeS newsletter provides an update for those interested in rainforest related issues in Amazonia, specifically in Madre de Dios, in south-east Peru, and the small-scale projects TReeS supports in this region.

This edition of the TReeS Newsletter focuses on new developments in monitoring deforestation across Amazonia as news spreads of an expansion of palm oil plantations in northern Peru as well as updating on gold-mining and gas exploration activities in Madre de Dios.

There is news of the 2015 TReeS Becas awards, feedback from a student supported by the Becas programme in recent years and a brief update on the Camu-camu project.

Carnegie Airborne Observatory scans Peru & Tambopata

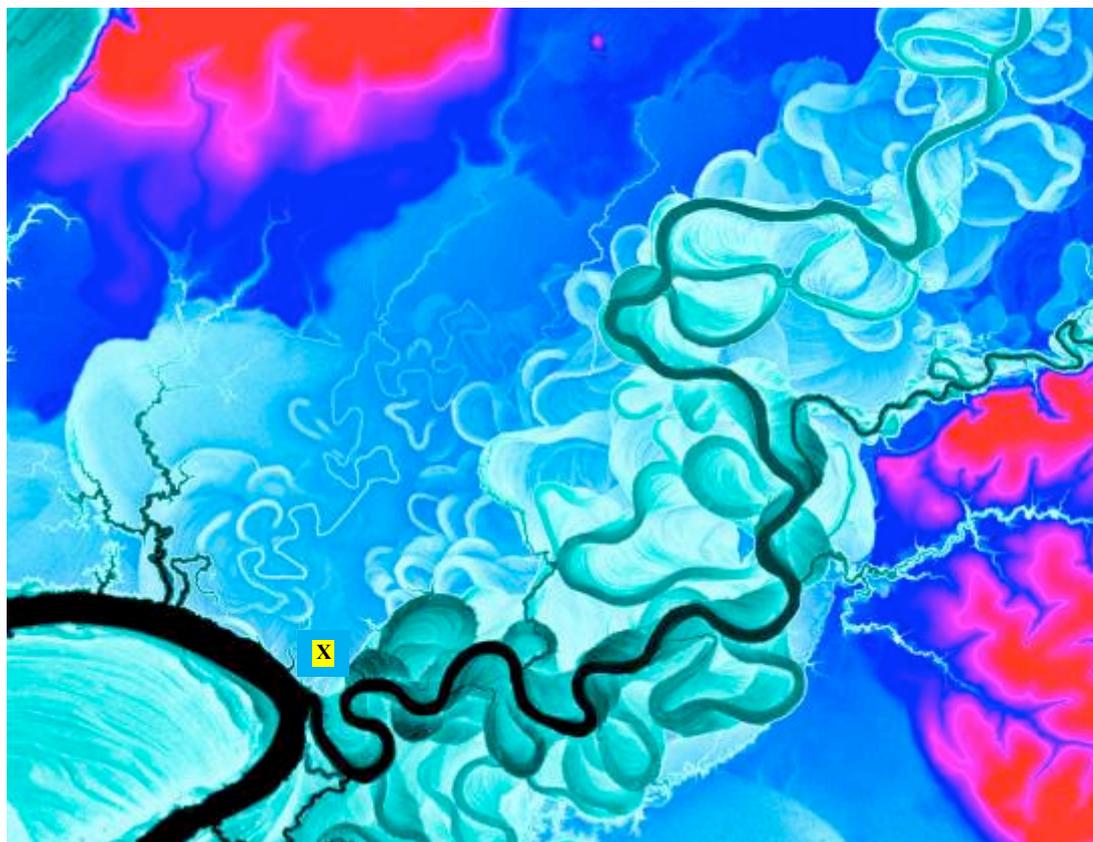
The Carnegie Airborne Observatory (CAO) has upgraded its facilities for surveying Amazonia. It's now able using airborne Light Detection and Ranging (LiDAR) technology, a new field plot inventory network, freely available satellite imagery, and geostatistical scaling techniques to undertake very high resolution scans of the forest structure, biomass and biological diversity (See page 2).

The lasers are also capable of penetrating the forest canopy to reveal tiny variations in ground elevation

associated with soils as well as its geologic history, including the path of ancient rivers and past inundations. The system can also reveal under-canopy damage from gold-mining and logging.

The image below shows a ground elevation map along a section of the La Torre river at its confluence with the Tambopata river (bottom left corner). It shows a huge number of ancient meanders in the La Torre river. The main channels of the rivers (black) are obvious, and there is evidence of some ox-bow lakes. However, most of the prehistoric oxbows are now seasonally dry and colonised by forest (various shades of blue). High points in elevation or river terraces (red) are covered in *terra firme* forest. The southern corner of Lake Cocococha which is no longer open water, is visible in the top left corner of the image.

The site of the Explorer's Inn is marked (x).



Peruvian Amazon carbon stocks assessment

From 2011-2013 the Peruvian government and the Carnegie Airborne Observatory (CAO), part of the Carnegie Institution for Science, led by Greg Asner, mapped the aboveground stored carbon density (ACD) at a one hectare resolution across Peru. The research has now been published- 'The High resolution carbon geography of Peru', G.Asner et al (Carnegie Institution for Science) (2015).

The research mapped the vegetation structure in 3-dimensions at an extremely high resolution, well beyond the capabilities of satellite-based systems. The CAO was able to capture detailed images of individual trees at a rate of 500,000+ per minute and to differentiate between different tree species.

The research reveals the extent of ACD across landscapes and ecosystems in Peru. The ACD map was then overlaid with land use data, including mining and logging concessions, protected areas and indigenous reserves to reveal both potential sources of greenhouse gas emissions as well as opportunities for carbon conservation.

The largest emissions are expected from selective logging operations and oil & gas developments (660 million tons). Lesser sources include agricultural expansion, expanding palm oil production, and gold mining. However, the report suggests that these sources could ultimately result in forest loss that outpaces their emissions projection of 140 million tons. These latter three activities

result in much higher emissions than logging and energy development since they involve large-scale forest clearance and are concentrated in lowland areas which store higher amounts of carbon.

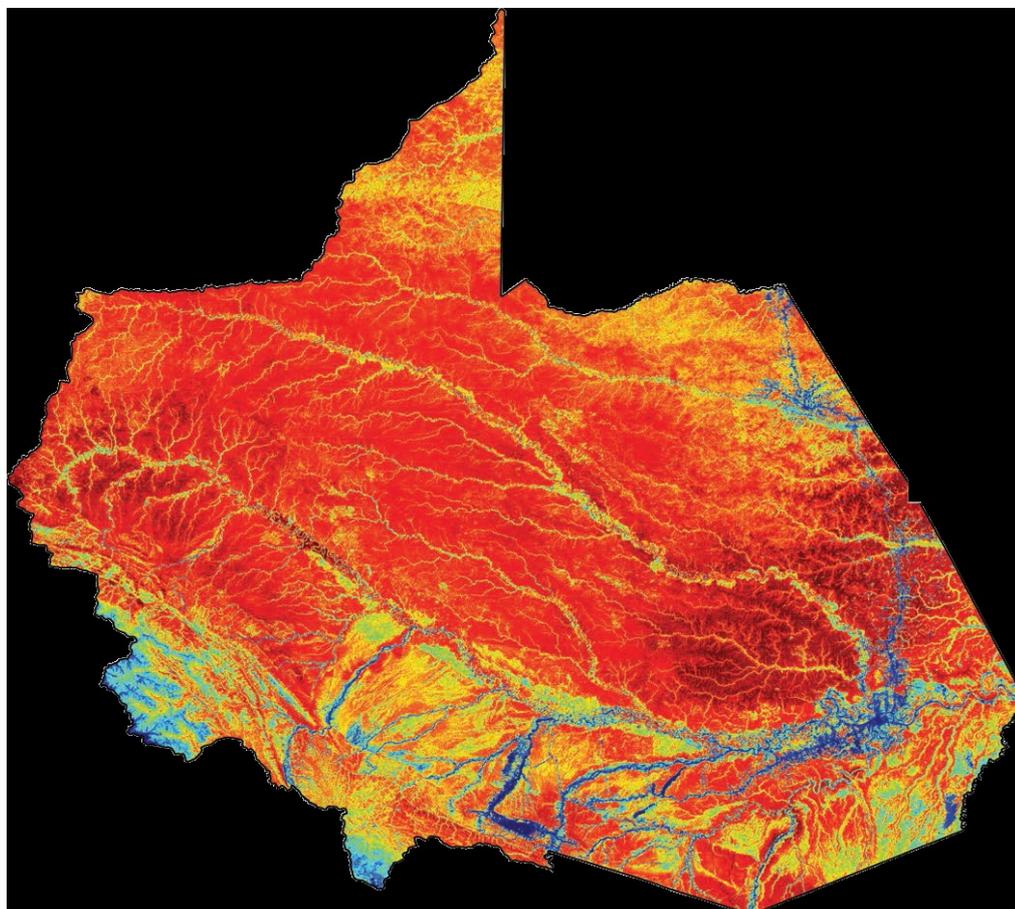
The study still suggests that opportunities exist to conserve large areas of forest in parks, indigenous territories, and unprotected areas.

Madre de Dios focus

Detailed maps have been produced for all the Amazonian departments of Peru.

On the map of Madre de Dios the absence of forest around Puerto Maldonado, as well as along the main roads and major rivers can easily be seen (**dark blue**). Running across the bottom of the map in the south-west corner, the **light blue** shading reflects the limited vegetation and carbon store of the high Andes. The **dark blue** area in the lower centre is the gold-mining area of Huaypetue, where the forest has been cleared, while the **dark blue** area in the bottom right is the Rio Heath savannah which, naturally, has a much smaller biomass. **Dark red** shading reflecting the highest concentrations of carbon are found on the west side (Manu Biosphere Reserve), in the south-east corner (Tambopata) and to the north of Puerto Maldonado.

Originally published in *Proceedings of the National Academy of Sciences* (PNAS). & www.mongabay.com R.A.Butler.



Madre de Dios - above ground carbon density

BLUE - *low carbon density:* along rivers and roads, bare rock, savannah, gold-mining clearance, plus urban areas.

LIGHT GREEN – *medium carbon density:* especially visible along the Alto Madre de Dios river, in the centre.

YELLOW – *high medium carbon density:* due to forest type, ie.bamboo forest.

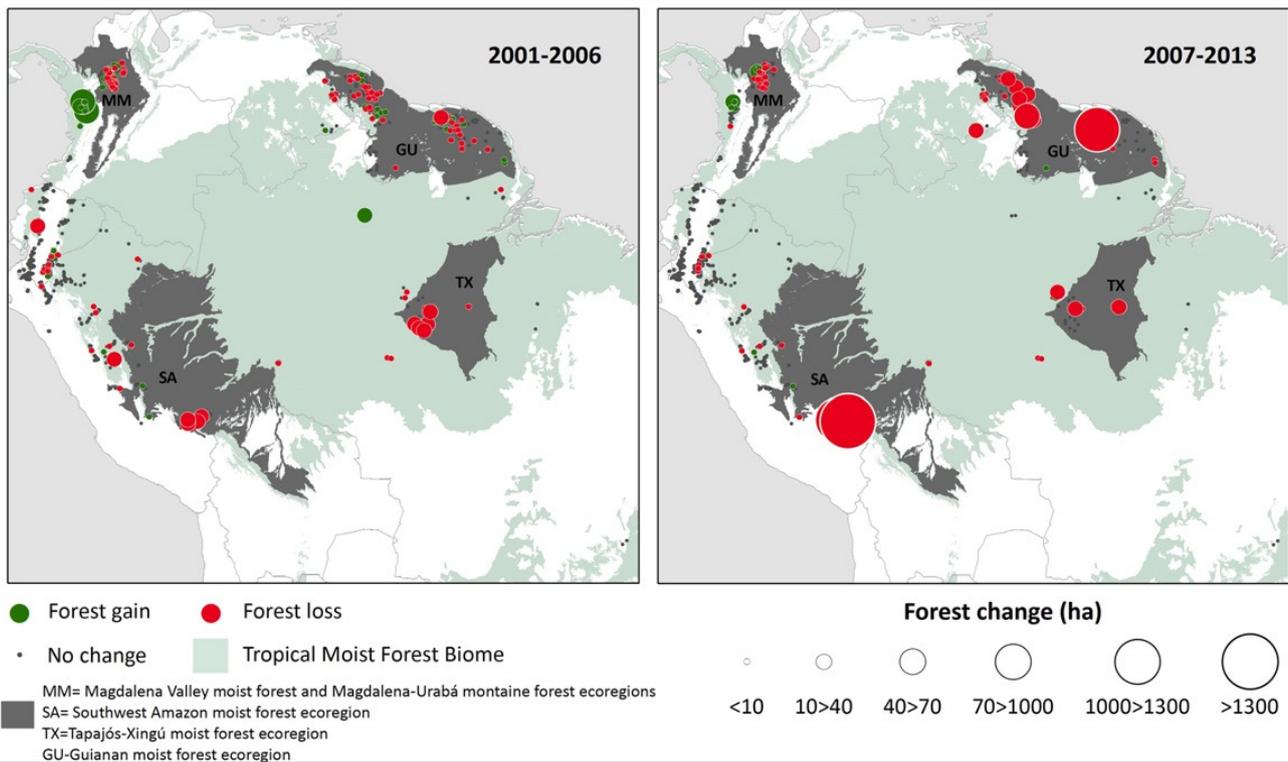
RED – *high carbon density.*

DARK RED - *very high carbon density:* in the west in Manu National Park and the east, north of Puerto Maldonado.

Gold-mining in Peru & Madre de Dios

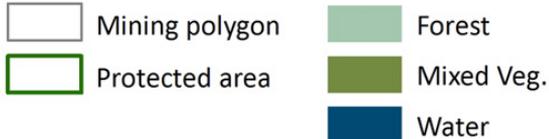
Global gold production increased from 2,445 tons in 2000 when the price was just \$250 an ounce to 2,770 tons in 2013 by which time the price had risen to \$1,300. In Madre de Dios, to meet the growing demand, it is estimated that 473km² of forest was lost 1999-2012, including 27km² in the Tambopata buffer zone, 103km² in the Amarakaeri Comunal Reserve and 66km² in the Tambopata National Reserve. From 1999 to 2007 nearly 22km² of forest was lost per year but mainly as forest was cleared for farming while the rate nearly tripled to nearly 62km² per year from 2008 to 2012 as gold-mining became the driving factor. With a farm worker earning on average \$20 per day and a miner \$10-200+ with the chance of greater riches, it is easy to see why gold-mining has increased.

The full article on which the following is based, can be read at - 'Global demand for gold in another threat for tropical forests', N.Alvarez-Berrios & T.Mitchell Aide, Environmental Research Letters 10 (January 2015).



Peru maps - distribution of gold mining sites with significant change in forest cover (ha) in periods 2001–2006 and 2007–2013. Small green dots represent an increase in forest cover, red dots represent a decrease in forest cover, and grey areas indicate significant changes in forest cover.

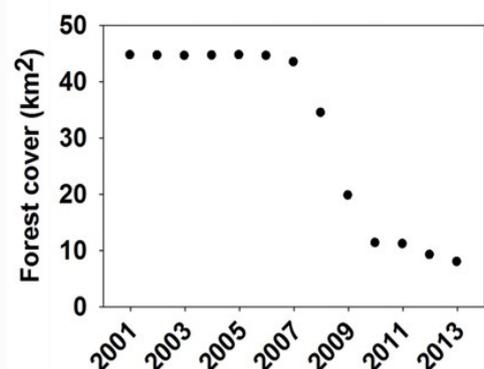
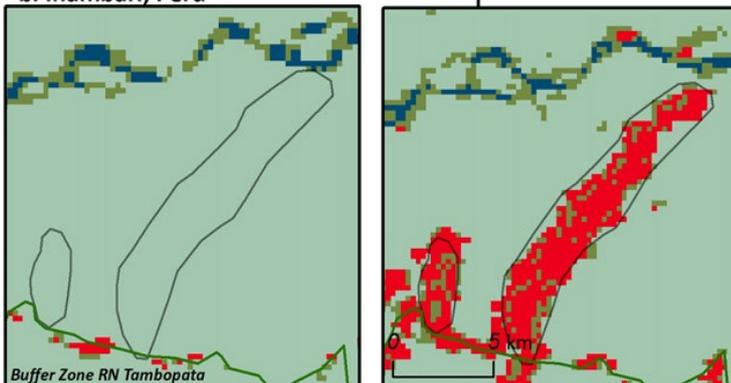
Maps legend



Iñambari (Guacamayo) case study

The 'before' and 'after' maps (below left) clearly reflect the extent of the deforestation that has occurred along the Guacamayo valley between the Inter-oceanic highway (running E-W at the base of the map) and the river Madre de Dios (running E-W across the top of the map) since 2006.

b. Inambari, Peru



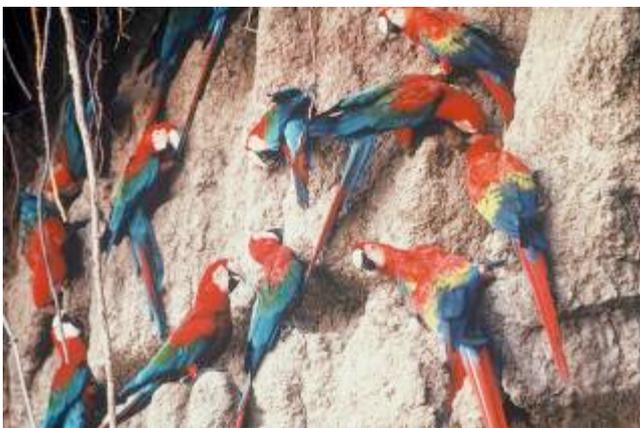
COP-20

In December 2014, Lima hosted the twentieth round of Climate Change summits to come up with a replacement for the 1997 Kyoto Protocol. It was attended by 195 nations. After two weeks of meetings, and many disagreements between richer and poorer nations, delegates approved a framework for setting national pledges which will be presented at the next summit in Paris later this year. The final document agreed -

- for an "ambitious agreement" to be proposed in Paris that reflects "differentiated responsibilities and respective capabilities" of each nation;
- developed countries would provide financial support to "vulnerable" developing nations to help them meet their pledges;
- that national pledges would be submitted by early in 2015 by those states "ready to do so";
- countries would set targets that go beyond their "current undertaking";
- the UN climate change body would report back on the national pledges in November 2015.

Environmental and indigenous groups, including Peruvian NGOs, were highly critical of the final summit document. They stated that many of the statements were far too bland, more or less meaningless and that they didn't go nearly far enough in addressing climate change issues. They warned that the agreement was far too weak to limit temperature rises to the internationally agreed limit of 2°C above pre-industrial levels.

Peru produces just 0.7% of global greenhouse gases but will suffer disproportionately from the impacts. These include increased frequency of droughts and severe flooding in Amazonia both of which will increase biodiversity stress levels. Weather patterns are also likely to become more unpredictable and El Niño events affecting the coast, and La Niña events affecting the southern Andes, are expected to become more severe.



Red & green and Scarlet Macaws at the Tambopata colpa

Peru News

There have been further Ministerial changes in President Humala's administration in recent months. He has now appointed seven Prime Ministers since he came to power in 2011. His administration is now struggling to get new legislation through Congress nearly a year away from the next Presidential elections.

In 2014 economic growth was 2.3%, compared to 5.8% in 2013, the lowest rate since 2009. The projected rate for 2015 is only 4% as demand and, consequently, prices for most minerals decreases.

The numbers living in poverty fell slightly in 2014 to 22.7% while those in extreme poverty also fell slightly to 4.3%.

In early June the Chinese Prime Minister, Mr Xi, visited Peru as part of a whistle stop tour of Latin America. Chinese companies now own 30% of the Peruvian mining sector. China is considered the key investor driving Peruvian economic growth. China has proposed a rail link between Peru and Brazil that would pass through Madre de Dios – more details in the next TReeS News.

The new Energy minister is the former Head of the national Environmental Certificate Service (Senace), a sub-office of the Ministry of the Environment (MINAM). The two Ministries are responsible for approving EIAs for all major mining projects. It is possible that the far more powerful Energy Ministry may in future be more conciliatory towards environmental issues.

In the meantime, there were major protests in the northern jungle against the activities of Pluspetrol (Argentina) after an oil leak. The protests left one person dead and 32 injured after riot police were called in. Pluspetrol has now been forced to withdraw from Peru. The protests almost coincided with the anniversary of the very similar protest at Bagua, in 2009, in which more than 30 people died.

In the south, a state of emergency has been declared in Islay province as local people protest against a Chinese financed mine which they believe will severely damage the environment and destroy their way of life. Roads have been blocked and on several days there have been clashes between locals and riot police.

The Ombudsman is now dealing with 200+ conflicts, most linked to the extractive sector and its activities.

We are grateful to the Peru Support Group (PSG):

www.perusupportgroup.org

and David Hill: @DavidHillTweets & www.hilldavid.com)

for the sourcing of some of the details in this Newsletter.

Programa de Becas (Small Grants program) 2015

The announcement of the 2015 small grants programme was made earlier this year. Seven small grants were awarded – the joint most awarded in any single year.

The Becas programme is an important contribution to the career development of young Peruvian scientists who will, potentially, be researching, working in and promoting Amazonia for decades to come. TReeS funding assists them in gaining all important field work skills that may allow them, subsequently, to join other more significant field research projects and conservation organisations.

Appeal: £25+ donations towards the cost of the **2016 grants programme**. Your support is essential in maintaining this programme.

Beca awards 2015

* **Reysi Mamani / Sandro Rengifo (UNAMAD):** *'Evaluación de la calidad fisiológica de semillas de tornillo (Cedrelinga catenaeformis Ducke) de bosques de terraza alta de dos procedencias, a traves de la prueba de envejecimiento acelerado';*

Reysi & Sandro are students at the Agrarian University of Madre de Dios, Puerto Maldonado. They will test the quality of *tornillo* seeds, including how they react when pre-aged. **Awarded: \$800**

* **Juan Carlos Medina (UNAMAD):** *'Efecto de la aplicacion de recubrimiento comestible apartir de distintas concentraciones de almidon en Papaya (Carica papaya), Limon Tahiti (Citrus aurantifolia), y Banano (Musa paradisiaca).'*

Juan Carlos is a student of the Agrarian University of Madre de Dios, Puerto Maldonado. He will study the possibility of extracting edible starch from papayas, lemons and bananas. **Awarded: \$900**

* **Juan Pablo Alva (UNMSM):** *'Entre la minería aurífera y la conservación: impactos, resistencia y libre determinación del pueblo Harakmbut'.*

Juan Pablo is a student at the University of San Marcos, in Lima. He will investigate the impact of gold-mining on Harakmbut communities and the rainforest territories that have supported them for centuries. **Awarded: \$750**

* **Ximena Gallegos (UNSA):** *'Etnobotánica de las plantas con mayor uso en dos comunidades nativas en la RNT y propuesta de programa educativo para su conservación y uso sostenible.'*

Ximena is a student of the University of San Agustín, Arequipa. She will investigate the importance of ethnobotanic plants in up to two indigenous communities and propose an educational programme to promote their conservation and sustainable use. **Awarded: \$700-900.**

* **Milagros Torres (UNLAM):** *'Caracterización de suelo en parcelas de recuperación con la especie Inga sp, con tres densidades de plantación, en un área degradada por efecto de la minería artesanal en Madre de Dios.'*

Milagros is a student of the University of La Molina, Lima. She will investigate the soil characteristics of three ex-gold mining lots being reforested in different ways to assess which method of reforestation may be most beneficial.

Awarded: \$900

* **Sherill Quispe (UNAMAD):** *'Efecto de la inclusión de la harina de semillas de Copoazu (Theobroma grandiflorum) en la dieta balanceada durante el crecimiento en fase juvenil de Paco (Piaractus brachyomus).'*

Sherill is a student of the Agrarian University of Madre de Dios, Puerto Maldonado. She will investigate the impact of including *Copoazu* seed flour in the feed of a staple fish – *paco* - in the Amazon diet. **Awarded: \$900**

* **Carmen Nacimiento (UNAMAD):** *'Evaluación del efecto de un pretratamiento enzimático en el proceso de obtención de aceite de castaña (Bertholletia excelsa H.B.K) en Madre de Dios.'*

Carmen is a student of the Agrarian University of Madre de Dios, Puerto Maldonado. She will evaluate the effect of enzyme pretreatment in the process of extracting brazil-nut oil. **Awarded: \$900**

Beca Recipient Feedback

***Talia Salas (Beca 2012):** *'Evaluación de los valores hematológicos en la tortuga taricaya (Podocnemis unifilis) del Centro de rescate de la Reserva ecológica taricaya, Puerto Maldonado, Madre de Dios'.*

Talia studied the haematology of turtles at the Turtle Reserve in P.Maldonado. Tortugas *taricayas* are widespread across Amazonia: of the 400 species of reptiles in Amazonia, 12 are freshwater turtles. Blood samples of 1-3ml were taken from 37 individuals, aged 3-4 years. The project assessed various hematological values: hematocrit, hemoglobin, total red blood cell counts, erythrocytic indexes, total protein, and the total and differential white blood cell counts to assess the health of the sample. Conclusions suggest that the health of the turtles is highly dependent on the frequency, amount and quality of food they can access.

Camu-Camu project update

1,100 seedlings have been planted on the periphery of the *aguajal* at the Bello Horizonte lodge run by APRONIA.

We are pleased to advise that full funding was secured for this stage of the project. There will be a more detailed update in the next newsletter.

Palm Oil plantations come to Peru

A major report by the Environmental Investigation Agency – a US NGO – has revealed the growing threat from palm oil plantations in the Peruvian Amazon. Over 1.5 million hectares have been identified as suited to palm oil production, an ingredient used in an enormous range of processed food products.

20,000 hectares, mainly in northern and central Peru, are already operational and there are now plans for 30,000+ hectares of primary forest to be converted.

The two main players are the Peruvian agro-industrial Grupo Romero and the British based Melka group. The latter has large oil palm operations in Malaysia where its operations have been heavily criticised. Malaysia and Indonesia produce 85% of the global oil palm supply but demand is rising. The Peruvian plantations will, initially, meet domestic needs.

Large areas of primary forests have already been cleared and the timber sold off. It has been suggested that much of this was undertaken without the proper legal permits. However, the Melka group have claimed that “by the time the plantation companies get to the land, that land has been logged and clearcut of all tropical hardwoods. It’s simply not rainforest.” Peruvian Forestry law allows the protection of primary forest to be overridden if it is considered to have ‘agricultural aptitude’ a classification based on soil and climatic characteristics but not accounting for the existing vegetative cover. The Peruvian Amazon covers 73 million hectares but 20 million hectares are yet to be assessed and are, especially, vulnerable.

The Melka group through its subsidiary Cacao del Peru Norte, has more recently announced that some of the land will be switched to cacao production while promoting itself to investors as ‘ethical chocolate’ producers. It plans to plant 500 hectares of cacao by the end of 2014 and 2,000 hectares by the end of 2015.

As yet there appear to be no plans to establish palm oil plantations in Madre de Dios.

Peru deforestation deal signed

Despite the apparent increasing threats to the Peruvian Amazon, Peru has signed a \$300m (£191m) deal with the Norwegian government to reduce net deforestation to zero by 2021 under the UN REDD+ programme. The deal aims to help cut greenhouse gas emissions from forest degradation and deforestation. Peru has also agreed to increase by 5 million hectares the land titled to indigenous peoples and to respect their territorial rights. Indigenous Federations have been requesting land titles totalling 20 million hectares be granted to 1,070 indigenous communities. The Federations state that this would guarantee a reduction in deforestation and, consequently, help to reduce global warming.

However, it has also granted an additional five million hectares as private concessions. The private sector already controls 40% of all oil, gas, logging, mining and large-scale farming interests in Peru.

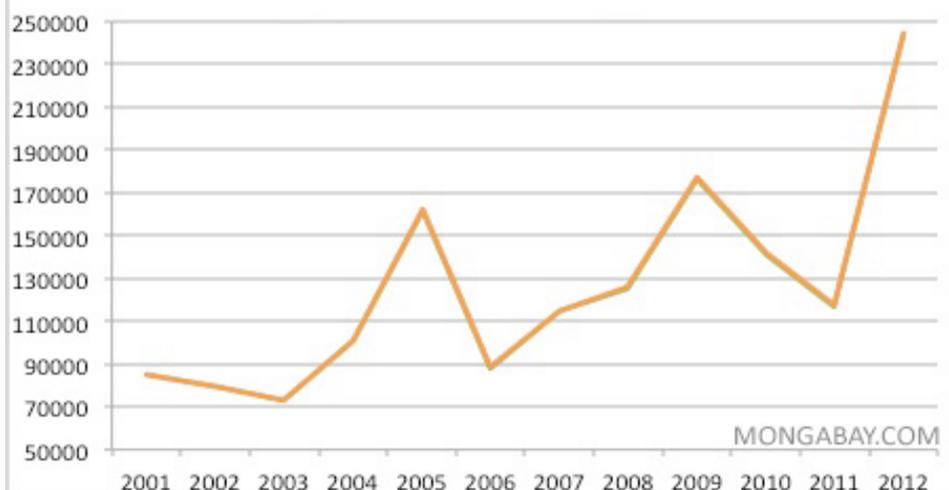
President Humala has also stated that *‘I don’t agree with labelling them (indigenous peoples) as guardians of the forest; for that the state should hire Park guards. I think that’s reducing their importance to simply forest guardians. I believe those communities need development.’*

Since 2002, 57 environmental activists are reported to have died in Peru making it the fourth most dangerous nation in the world in which to be an environmental defender.

In March though, Peru replaced the controversial Forestry law dating back to 2000 with a new law: *Ley 29763*. Indigenous organisations will be able to access an \$800 million fund to assist with land titling. Indigenous groups will now be consulted more fully about new legislation and activities affecting them.

Overall, government policies and approaches remain conflicting, and calls remain for the establishment of a Ministry for Indigenous Peoples.

Forest loss (ha) in Peru, 2001-2012



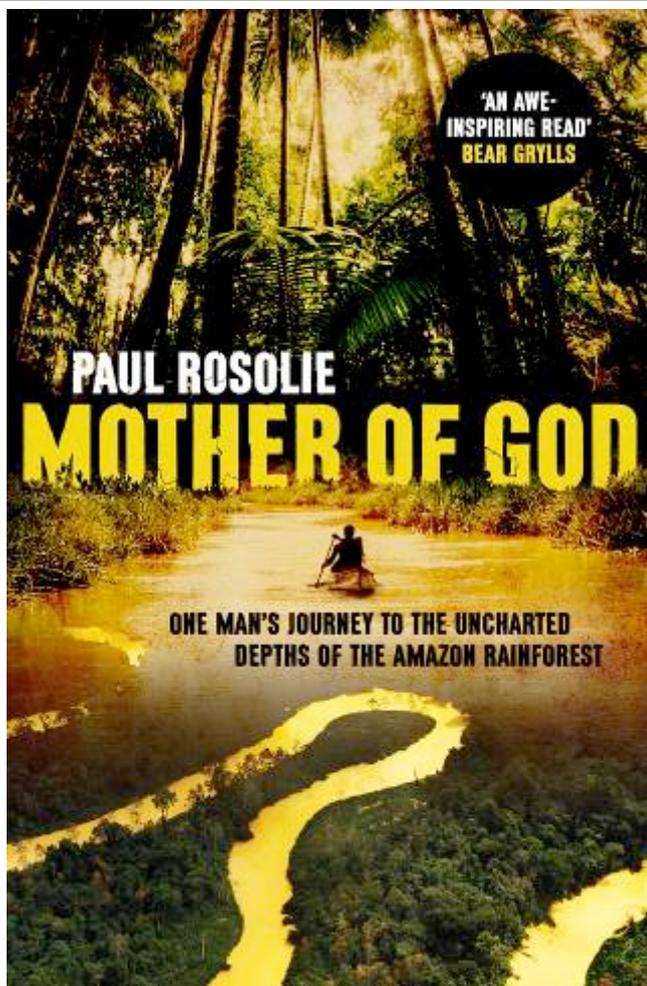
Gas exploration in Lot 76 suspended

Despite reports that Lot 76, located between Manu Biosphere Reserve and the Tambopata region and overlapping with the Amarakaeri Communal Reserve, could contain one of the largest gas deposits in Peru, the latest indication is that Hunt Oil may have suspended operations.

Seismic lines were cut through the forest and the first of eight planned, 3km deep, drilling platforms became operational earlier this year. It looks as if the initial results proved disappointing and may mean that Hunt Oil withdraws before making further investments.

In the meantime, concerns had continued to be raised about the extent to which Hunt Oil had accounted for significant cultural and archaeological sites within the area in their impact assessment:- see TReeS No.74.

The increased activity in the forest on the eastern foothills of the Andes revealed the location of a 'rock face', several metres high, carved in to the side of a remote valley. The feature would appear to combine a natural rock formation and human intervention some centuries ago. The 'face' features in Harakmbut oral traditions and is considered part of the cultural and spiritual patrimony of the Harakmbut peoples. The fact that it has been 'rediscovered' reflects the extent to which their cultural knowledge has been 'lost' in recent decades as they remain more within their communities and the younger generations rarely venture deep in to the forest.



'Mother of God'

The naturalist and explorer Paul Rosolie first went to Madre de Dios, in 2005, when just 18 years old. The trip was, initially, due to last just 3 weeks when he decided to flee New York in search of rare flora, fauna and adventure but he has now spent the last 10 years travelling through western Amazonia

In 'Mother of God' he describes the time he has spent on the Las Piedras river which runs north-west from Puerto Maldonado, experiencing extreme weather conditions and some of the world's harshest terrain while making sightings of caiman, jaguar, anacondas and anteaters. He describes how he has battled with life-threatening tropical diseases and the mental challenges presented by frequently finding himself alone in the jungle.

Reviewers have described '*Mother of God*' as an 'astonishing tale of adventure and survival, set in one of the world's few remaining truly wild places. It's a story of nature, red in tooth and claw, and how we must both respect its awesome power and protect its extraordinary glory.'

Paul now runs Tamandua Expeditions which supports conservation in the Las Piedras region through tourism. Further details can be found at – www.tamandujungle.com

We are grateful to the Bantam Press - publishers of the '*Mother of God*' for sponsoring this newsletter. The book is available from all good bookshops.

Paul also hit the headlines last year when he, controversially, attempted to be 'eaten alive' by an anaconda for a Discovery Channel stunt.

Rosolie tracked down a 20ft-long green anaconda before he donned an 'armored' suit covered in pig's blood. As the cameras rolled, he crawled on all fours towards the snake. Anacondas, the largest snakes in the world, typically suffocate their prey before ingesting it.

The snake coiled itself around his body, while clamping its jaws on to his head. As he felt his arm 'start to break', he asked his team to rescue him. Only part of his head was inside the snake when friends wrestled it off him.

Conservation organisations and social media users were critical of the stunt which was aired despite protests on both sides of Atlantic. However, Mr Rosolie justified the stunt by stating that he had organised it to raise money to conserve the snake's habitat along the Las Piedras river.

For those interested, the stunt can be viewed at - <https://www.youtube.com/watch?v=-IYuCWCBOIO&safe=active>

TReeS Newsletter by email

Due to ever increasing postal charges, TReeS plans to distribute the newsletter by email in future. We hope to make the next newsletter the last one sent out by post unless a hard copy sent by post is specifically requested.

On this basis, if you have received this Newsletter by post and don't think we have your email address in our database, please email us at: treesuk1@gmail.com

- TReeS Library:** forthcoming deposits will include the following reports (those in Spanish are untranslated) -
- '*Global demand for gold in another threat for tropical forests*', N.Alvarez-Berrios & T.M.Aide (2015);
 - '*Valores hematológicos y presencia de hemoparásitos de una población de tortugas taricayas en cautiverio*', (informe parcial) Talia Salas (2013); & '*Evaluación de los valores hematológicos en la tortuga taricaya (Podocnemis unifilis)....*', (informe final) Talia Salas (2013);
 - '*Deforestation by definition*', various (EIA) (2015);
 - '*The High resolution carbon geography of Peru*', G.Asner et al (Carnegie Institution for Science) (2015);
 - '*Targetted carbon conservation at national scales with high-resolution monitoring*', G.Asner et al (PNAS) (2014);
 - '*Fast demographic traits promote high diversification rates of Amazonian trees*', T.Baker et al (Ecology Letters 17) (2014);
 - '*Drought sensitivity of Amazonian carbon balance revealed by atmospheric measurements*', L.Gatti et al (Nature Vol.506) (2014);
 - '*Size and frequency of natural forest disturbances and the Amazon forest carbon balance*', F.Espirito-Santo (Nature Communications 5:3434) (2014);
 - '*Ficus insipida subsp.insipida (Moraceae) reveals the role of ecology in the phylogeography of widespread Neotropical rainforest tree species*', E.Honorio et al (Journal of Biogeography) (2014);
 - '*Hyperdominance in Amazonian forest carbon cycling*' S.Fauset et al (Nature Communications 6:6857) (2015);
 - '*Analysing Amazonian forest productivity using anew individual and trait-based model (TFS v.1)*', N.Fyllas et al (Geoscientific Model Development 7) (2014);
 - '*Markedly divergent estimates of Amazon forest carbon density from ground plots and satellites*', E.Mitchard et al (Global Ecology & Biogeography) (2014);
 - '*Dynamics, aboveground biomass and composition on permanent plots, Tambopata National Reserve*', N.Pallqui et al (Revista Peruana de Biología 21 (3)) (2014);
 - '*Drought impact on forest carbon dynamics and fluxes in Amazonia*', C.Doughty et al (Nature Vol.519) (2015);
 - '*Long-term decline of the Amazon carbon sink*', R.Brienen et al (Nature (Vol.519) (2015);

TReeS Membership

Members are reminded that the basic TReeS membership rate is now £15 / annum.

Membership is due on the 1st of **January** each year.

We would be most grateful if members could amend their standing orders, if necessary.

All cheques are payable to – 'TReeS'.

TReeS Membership:
£15 per annum.

TReeS contact details –
P.O.Box 33153,
London NW3 4DR

TReeS USA –

P.O.Box 842, Shasta Lake,
CA96019-0842, USA.

TReeS USA is run by Bud and Margaret Widdowson.

All members in Canada / the USA are requested to pay their annual membership via TReeS USA.

TReeS committee 2014-2015

Sally Edwards
John Forrest
Dr Helen Newing
Huma Pearce
Elizabeth Raine
Daniel Turner
Rebecca Warren

TReeS website

Details of **TReeS merchandise** can be found at the website:

www.tambopata.org.uk

If you would like to receive the TReeS Newsletter in future by email, please send a request to –

treesuk1@gmail.com

TReeS Merchandise

***Animal drawings greeting cards -** based on beautiful line drawings by artist Laurel Hanna. Designs include: Tree-frog, Black Caiman, Saddleback Tamarin, Razor-billed Curassow, Puma, Scarlet Macaw, Ocelot, & Tarantula.
Price: £5.00 for 7 (including envelopes).