Supplementary Material D

Raw Data for PES Case Studies:

Table 1. Bolivia Case Studies

Foundational Aspects					Capital Asset Outputs				Conclusions and Recommendations
Report character	***Study Context***	***Study Focus/Analysis***	***Methods***	***Method Constraints***	***Human/ Social Capital***	***Natural Capital***	***Financial Capital***	***Institutional Capital***	
R1: A R2: N M Asquith, M T Vargas & S Wunder R3: 3 R4: 2008 R5: 1 R6: Ecological Economics R7: 1 R8: 5[1] R9: 1 R10: 1[2], 3[3], 4[4]	S1: SA S2: Bolivia S3: Los Negros Valley S4: 1, 2, 4 S5: 4, 5[5], 10[6] S6: 1, 2, 4	The article provides an analysis of the current development, implementation and summary of the Los Negros project, a dual ecosystem service functioning PES scheme in Bolivia.	M1: 6[7] M5: 1		HSC1: 0 HSC5: 1[8]	NC0: 1[9] NC1: 3[10] NC2: 2(**) NC3: 1[11], 5a[12], 6[13] NC4: 1[14], 2[15], 4[16]	FC0: 0 FC1: 2[17] FC2: 1, 2[18] FC3: 2[19], 4[20] FC4: 2[21]	IPC1: 1 IPC2: 1, 2, 7, 9[22] IPC3: 1[23]	BP: 1, 2, 7, 8, 9 OP: 2, 3, 7, 9, 11, 12

[1] CIFOR, Fundación Natura Bolivia
[2] European Union
[3] Swiss Development Cooperation)
[4] CIFOR, Property & the Environment Research Centre
[5] Deforestation, illegal land clearing
[6] Population growth and migrant colonisation: incursion in areas of high biodiversity for extractive resource reasons.
[7] Employs current available data to summarise the present state of the Los Negros PES scheme developments.
[8] The authors note that there has been no specified targeting of poor and/or disadvantaged households and groups. In point of fact, within the area in which the PES project is occurring, the poorest groups are those without land rights: the landless immigrants. Indeed, these groups are even more disadvantaged by a healthy functioning PES scheme because it actively reduces land invasion. However, the authors also note that the PES scheme does include a lot of moderately poor native populations.
[9] In the sense of providing estimates regarding the extent of changes in agricultural practices or forest area rather than the measurement of specific ESs per se.
[10] In 2003, 592ha were protected, rising to 900ha in 2004, 1111ha in 2005 and 2274ha by mid-2007.
[11] From a mean point of view this amounts to an increase in forest/grassland protected area within the scheme of 420ha/yr between 2003 and 2007.
[12] The authors note that there is a lack of additionality as they detect little change in conservation behaviour. Farmers are likely to be risk averse and enrol parcels of land that would not have been cut or cleared anyway. The authors identify that farmer self-selection of enrolled land is problematic. They state that 'In terms of the declared objective to change local land-owners' behaviour by providing forest conservation incentives, the PES initiative may thus not be performing so far' pg. 681.
[13] In most cases the level of threat i.e. potential environmental changes to proposed PES land, was generally low pre-PES and remained so, if not zero, post-PES introduction.
[14] Hydrological services (watershed protection – water flow regulation, quantity/quality), forest and biodiversity services (habitat protection for migrant bird species)
[15] Lack of hydrological data. Baseline water flow and bird species inventories were not determined prior to the onset of the scheme.
[16] Baseline focus has been on land cover types and the land uses assumed to significantly enhance ecosystem service provision, for example, the link between cloud forest cover and dry season water flow. Since the onset of the project there have been moves towards generating hydrological data. Indeed, a small sub- grant of US$10,000 has been used to establish where protection of upstream forests is likely to create and enhance hydrological services. In a similar vein an avifaunal survey conducted in spring 2005 contributed some baseline data. Many of the locations of avifaunal biodiversity are located in cloud forested areas within the Los Negros Valley indicating that focus on cloud forest protection is a useful management tool of the PES scheme.
[17] 46 farmers
[18] 83 of the parcels enrolled under the payment scheme were between 1 and 50ha.
[19] With the in-kind payment of beehives, apiculture has opened up both a new labour and financial market to prospect.

R11: 3, 4 (Primarily), 1, 2 (Secondary)

[20] The authors note that there is some indication that apiculture is skill dependent, such that success within villages can vary quite substantially. Therefore factoring labour, honey yields and wage rages over the life expectancy of a beehive provides a net present value for beehive transfers in the range of US$-15/ha/yr to US$13/ha/yr.
[21] Although this has not been tested and the PES is not specifically targeted at the most disadvantaged recipients, many of the participating farmers are moderately poor.
[22] The lack of credible downstream institutions was identified in order to ensure equitable scheme contributions
[23] There was a fear that distrust – stemming from accountability issues- between upstream and downstream farmers relating to payments would affect the production of conservation outcomes

Table 2. Comparative Cambodian Case Studies

Foundational Aspects					Capital Asset Outputs				Conclusions and Recommendations
Report character	***Study Context***	***Study Focus/Analysis***	***Methods***	***Method Constraints***	***Human/ Social Capital***	***Natural Capital***	***Financial Capital***	***Institutional Capital***	
R1: A R2: T Clements, A John, K Nielsen, D An, S Tan and E J Milner-Gulland R3: 6 R4: 2010 R5: 1 R6: Ecological Economics R7: 1 R8: 1, 2, 5 R9: 1 R10: 1[24], 2[25], 3[26]	S1: As S2: Cambodia S3: Northern Plains landscape (Kulen Promtep Wildlife Sanctuary and Preah Vihear Protected Forest) S4: 1, 2, 4 S5: 5, 10[27] S6: 1, 3, (4)	The paper presents a comparative analysis of three institutionally different PES programmes in operation in two protected area locations within the Cambodian Northern Plains region. The analysis	M1: 1[28], 6[29] M2: 1[30] M3: n/a M4: n/a M5: 1	C2: 1[31] C3: 1	HSC1: 0	NC0: 1 NC1: [32] NC2: 5[33] NC3: 4 (See NC2: 5), 5b, 8[34] NC4: 1[35], 3[36], 5, 6[37], 7[38]	FC0: 1 FC1: 1[39], 2[40], 3[41] FC2: 4[42] FC3: 2[43] FC4: 1[44] FC5: 4[45]	IPC1: 1 IPC2: 1[46], 2[47], 3[48], 4[49], 7, 8 IPC3: 0	BP: 1[50], 8, 9[51], 10[52] OP: 2, 9, 12

[24] DfID
[25] WCS (Word Conservation Society), USAID, UNDP, GEF, Danish International Cooperative Agency, IUCN
[26] Edith McBean, Jeniam Foundation
[27] Biodiversity threat and urbanisation
[28] Compares the institutional effectives of three PES programmes: Community-based ecotourism venture, type of agri-payment scheme for wildlife-friendly products and direct contracts for bird nest protection
[29] The paper collects together available information regarding each PES programme.
[30] Observational in the sense that the information obtained was not experimentally (used in the broadest sense) retrieved.
[31] No information is given with regards to how, when and from where the data were collected and obtained. This, to some extent, questions the data's underlying credibility.
[32] Some habitat is specifically targeted in the case of community-based ecotourism and agri-payment scheme PES programmes and varies from 10 – 50000ha, but this figure refers more to the size of the village and surrounding habitat rather than a traditional PES scheme which designates (x)ha with a price per unit hectare.
[33] Management arrangements reflect the adoption of a specific management plan (details not disclosed) and the avoidance of hunting, both for ecotourism and agri-payment schemes. Protection of birds' nests is the main management activity for the bird nest protection scheme.
[34] The authors note a 'substantial increase in species populations for both bird nest and ecotourism programmes'. Numbers of nest colonies have increased from 13 in yr 1 (2003 – 2004) for 1 bird species to 410 in yr 5 (2007 – 2008) for 7 bird species, a 36% annual increase. Numbers of white shoulder ibis increased from 2 individuals in 2002 to 23 individuals in 2008.
[35] Biodiversity, leisure/tourism
[36] Rudimentary data on biodiversity indicators, in some cases the effects of the PES schemes were too early to identify. Tourist numbers for bird watching, for the ecotourism PES scheme, have increased from 13 visitors in 2003-4 to 125 visitors in 2007-8.
[37] Overall, the authors demonstrate that species levels, specifically bird species, have generally increased since the adoption of the various PES schemes.
[38] With regards to the bird nest protection scheme nest protectors were unable to prevent others from clearing breeding sites.
[39] For agri-payment PES scheme four villages and a total of 38 families were involved, the number of individuals was not detailed.
[40] Bird nest programme involved 13 villages in 2005-6, 17 villages in 2006-7 and 16 villages in 2007-8, number of individuals involved approx. 1000.
[41] For the community-based ecotourism scheme 40% of families (40% of 236 families = 94) were associated to some extent with the programme. In 2005 12 individuals were regularly employed by the programme, this increased to 25 by 2007 – 2008.
[42] In the community-based ecotourism scheme villages received 11% (2003-4) to 24% (2007-8) of revenues, in the agri-payment scheme villages received 55-60% of revenues and in the bird nest protection scheme villages received 71-78% of revenues.
[43] 10% of families were employed in the ecotourism scheme, 5% to 10% were employed in the agri-payment scheme and 5% of families were employed in the bird nest scheme.
[44] The authors note that agri-payments, being proportional to land size, favoured larger landowners. However, they also note that additional village-level mechanisms were employed to ensure a wider distribution of benefits. In general, significant payments are made only to a minority of families in each programme, thus the authors note that to some extent all the programmes have an inherent inequity – though they emphasise that the bird nest programme due to its direct contract nature benefits the least number of people and does not advance wider benefit sharing.

R11: 2, 3, 10	focuses on the institutional effectiveness of these programmes from an economic, institutional and environmental perspective.

[45] It's not clear what contribution payments make (for any of the three programmes) to household level income, as this information is not detailed, but it is clear that payments can be significant. For example, with regards to the community-based ecotourism programme, those individuals employed as guides, cooks and guesthouse managers would potentially receive $20-40/month → ($160-$400/yr), which compared to earnings from subsistence agriculture of $350-$500/year is highly significant.

[46] Common property co-managed between villages and Protected Area (ecotourism and agri-payment), and in the case of Bird nest protection PES then individuals have control. In the case of the community-based ecotourism scheme the villages developed and enforced their own rules regarding the species that will be protected and be the basis on which agreements are made.

[47] In the case of the ecotourism-based scheme and the agri-payment scheme then the schemes are locally governed.

[48] WCS manage the scheme.

[49] Organisational arrangements in the ecotourism and agri-payment scheme are quite complex, involving a range of actors and calling for cross-collaboration and the development of institutions, which contrasts with the direct payment scheme between WCS and individual villagers in the bird nest protection project.

[50] Initial start-up costs for the ecotourism and agri-payment scheme projects were high approx. $50,000/village, whereas for the nest protection scheme initial start-up costs were low.

[51] In that WCS has to input funds on an annual basis to maintain the birds nest project its underlying financial viability is questionable, whereas the other schemes maintain their own revenue streams.

[52] Lack of institutional capacity with respect to the bird nest protection scheme was problematic, in the areas with weak institutions direct payments need a strong institutional framework (which was not the case here) and also payments to some individuals but not to others does not generate overall support for conservation activities.

Table 3. China Case Studies

Foundational Aspects					Capital Asset Outputs				Conclusions and Recommendations
Report character	***Study Context***	***Study Focus/Analysis***	***Methods***	***Method Constraints***	***Human/ Social Capital***	***Natural Capital***	***Financial Capital***	***Institutional Capital***	
R1: A R2: M T Bennett R3: 1 R4: 2008 R5: 1 R6: Ecological Economics R7: 1 R8: 1 R9: ? R11:1, 3, 4	S1: As S2: China S3: Multiple regions S4: 1, 2, 4 S5: 1, 2, 3, 4, 5 S6: 1 (primary) 2, 3, 4 (all to lesser degrees)	The paper uses current available evidence to examine the current extent of China's SLCP programme design, implementation and impact on rural households and the surrounding landscape. It proceeds from an institutional-economic perspective.	M1: 6 M2: Relies on data obtained through a 2003 survey conducted by the Centre for Chinese Agricultural Policy (CAS) M5: 1	C2: 1[53]	HCS1: 1[54] HSC2: 1 / 2[55] HSC3: 1, 2, 3, 4[56] HSC5: 3[57]	NC0: 1/0[58] NC1: 6[59] NC2: 1[60], 3[61] NC3: 1[62], 3, 4[63], 5b NC4: 1[64], 2, 4, (6 / 7)[65]	FC0: 1 FC1: 6[66] FC2: 1[67] FC3: 1[68] FC4: 2	IPC1: 0 IPC2: 3, 5[69] IPC3: 0	BP: 1, 3[70], 6 OP: 1, 2, 4, 7, 9, 11
R1: B R2: J Liu, S Hi, Z Qyang, C Tan & X Chen	S1: As S2: China S3: Nationwide S4: 1, 2, 3, 4	The article presents a description and overview, in terms	M1: 6 M2: 6[73] M5: 1		**NFCP**				

[53] Much of what Bennett concludes about the SLCP is based upon a 2003 survey conducted by the CAS. The nature, reliability, validity, and limitations of the survey are not documented - it is therefore taken on trust that the data presented and the judgement and conclusions made by the author are of a robust nature as there is no indication that these survey aspects have been critically appraised.

[54] Briefly discussed, but only cursorily so.

[55] Mixed evidence to date – Bennett states that it is perhaps too early to tell: some evidence to show a general increase in household income.

[56] A programme aspiration, again for which there appears to be mixed evidence in support.

[57] According to Bennet because the programme focuses on areas with a high proportion of sloping land under cultivation this implicitly targets poorer households.

[58] No rigorous scientific appraisal of the programme's natural capital impact yet exists – in relation to the underlying biophysical processes i.e. ecosystem functioning.

[59] In 2002 7.2 million ha of cropland had been converted and 4.92 million ha of barren land afforested. By the end of 2005 the area of cropland enrolled had increased to 9 million ha.

[60] Afforestation of barren/waste-land

[61] Cropland conversion to forest and grassland

[62] 408,000 ha/yr of cropland converted to forest and grassland during the pilot phase 1998-2001, which increased to 2.3 million ha/yr during 2002-2003.

[63] Reduction in cropland farming practices, shifting from cropping to husbandry, increase in timber plantation, grassland and forest cultivation practices.

[64] Hydrological services: flood and drought mitigation/desertification reduction/soil erosion, forest/carbon services and timber provisioning services.

[65] Not enough evidence to establish if ESs are being provided and preserved by the adopted management practices.

[66] In the first five years of the programme 15 million farmers entered the programme

[67] Most of the targeted farms, as a consequence of concentrating on sloping land are small landholders

[68] According to Bennett, it is too early to disclose the programme impact on participants' income. However, the available evidence indicates that in the absence of payments there would be a significant re-conversion of the land, as crop cultivation accounted for over 50% of household income in 37% of cases – which perhaps indicates the importance of programme payments.

[69] In a 2003 FSA survey only 43% of participants thought that villages had been consulted by higher levels of authority regarding programme design and implementation. Moreover, only 53% of households felt that they could choose whether or not to participate indicating substantial centralisation of control.

[70] Subsidies were shown to be poorly delivered.

R3: 5 R4: 2008 R5: 1 R6: PNAS R7: 1 R8: 1 R9: 1 R10: 1[71], 4[72] R11: 1, 2, 3, 4	S5: 1, 2, 3, 4, 5, 9 S6: 1, 2, 4	of ecological and socio-economic impacts, of China's National Forest Conservation Programme (NFCP) and Sloping Land Conversion Programme (SLCP). The paper also highlights future opportunities and challenges and presents some recommendations that may improve	HSC1: 1 HSC2: 1 / 2[74] HSC3: 2, 3, 4 HSC5: 1 / 2	NC0: 1 NC1: 6[76] NC2: 1, 2, 3 (***)[77] NC3: 1[78], 4[79], 5a[80], 5b, 7, 8[81] NC4: 1[82], 2, 3[83], 4, 5, 6[84]	FC0: 1 FC1: 6[90] FC2: 1, 2 FC3: 1, 3[91]	IPC1: 0 IPC2: 3, 5 IPC3: 0	Overall BP: 2, 6, 10 OP: 2, 4, 7, 9, 10, 11
			SLCP				
			HSC1: 1 HSC2: 2 / 3 HSC3: 1, 2, 3, 5 (*)[75] (**) HSC5: 3	NC0: 1 NC1: 6[85] NC2: 1(***), 2 (**), 3(***) NC3: 1[86], 4[87], 5b, 7, 8 NC4: 1[88], 3[89], 4/5, 6	FC0: 1 FC1: 6[92] FC2: 1, 2 FC3: 2[93], 3[94] FC4: 2 FC6: 3[95]	IPC1: 0 IPC2: 2, 3, 5 IPC3: 0	

[73] Comment and analysis review based on available material regarding China's ecosystem service policies.

[71] National Science Foundation/ National Aeronautics and Space Administration/ National Natural Science Foundation of China/ National Key Basic Research Programme of China

[72] Michigan Agricultural Experimental Station

[74] The level of impact differs between provinces.

[75] According to the article SLCP or Grain for Green Programme has directly benefitted 120 million farmers (or 30 million households). In most regions SLCP has improved socio-economic wellbeing, although the detailed evidence for this not always apparent in the paper. Surveyed households generally consider SLCP to be of value.

[76] In 2000 the total area without logging had increased to 8.9 million ha. By 2005 the area under mountain closure and plantation reached 11 million ha.

[77] This is a result of a reduction in logging from natural forests and an increase in timber extraction from developed plantations.

[78] Commercial logging from natural forests had ceased in 13 provinces by 2000. There also occurred a 43% reduction in timber harvests in northwest China and Inner Mongolia from 1997 to 2003.

[79] The main source of employment has shifted from logging to forest management and plantation farm practices.

[80] This is due to displaced resource extraction. Reductions in home-grown logging China have shifted to extractive logging harvests in the wider global tropical belt. According to the authors, in 2005 China imported 10.4% more logs than in 2004 of 25% of which came from tropical forests.

[81] In general terms plantations have cultivated native species such as pine and Chinese fir, although non-natives such as poplar and cypress have also been planted. There is a general drive towards diversifying the species to prevent the domination of the landscape by a few tree species. In addition, in the Wolong Nature Reserve panda habitat has been shown to be recovering.

[82] Carbon/forest services, watershed services: flood control, soil erosion, timber provision.

[83] In the case of carbon sequestration: 1998-2004 21.3Tg of carbon was sequestered in new plantations and carbon emissions were reduced by 22.8Tg through reduced wood production.

[84] In relation to carbon

[85] By the end of 2006 20 million ha were influenced by the programme through afforestation or agricultural retirement and conversion.

[86] According to the authors 9 million ha of cropland has been converted into forest and grassland, and a further 11.7 million ha of barren land afforested by end of 2006. Furthermore, the SFA forest cover within the SLCP region has increased by 2% between 1998 and 2006.

[87] From cropping to forest management, afforestation and forest protection.

[88] Forest/carbon, hydrological services (water conservation, flood mitigation, soil eroision)

[89] According to the paper SLCP has resulted in a reduction in surface run-off (75-85%) and soil erosion (85-95%) in converted areas over a five year period. Moreover, soil properties have been improved by enhancement of soil fertility. In Shaanxi province after five years SLCP plots have 48% more soil moisture and 55% greater moisture-holding capacity compared to non-SLCP plots. The economic value of these ESs bundles has been estimated to range from 10^6 to 10^8 yuan.

[90] 1.2 million logging and processing workers have been impacted by the NFCP.

[91] The authors describe a mixed picture. In some areas total income has increased as a consequence of monetary flows from tourism, average output from the so-called 'Third Sector' (hotels, entertainment etc.) in 32 forest enterprises has increased from 8.5% in 1997 to 20.1% in 2003. Government subsidies and other sources have offset timber revenues. However, other forest enterprises have seen their 'Third Sector' reduce significantly since the onset of NFCP,

		programme short comings.							
R1: C R2: L Zheng, R Tu & AP J Mol R3: 3 R4: 2008 R5: 1 R6: China & World Economy	S1: As S2: China S3: Ningxa Hui Autonomous Region (3 southern counties: Tongxing, Pengyang and	The article investigates the implementation and conception behind the SLCP. The paper concentrates on one specific geographic region	M1: 3 M2: 3 M3: 1 M4: 316 (represents valid household questionnaires from 12 townships)[96]	C1: 1, 2, 3, 4[97] C2: 1[98] C3: 1	HSC1: 1 HSC2: 1, 2[99] HSC3: 1[100], 2[101], 3[102] HSC5: 3	NC0: 1 NC1: 6 NC2: 1, 2(***), 3 NC3: 1[103], 4[104], 5b NC4: 1[105], 2, 6[106]	FC0: 1 FC1: 6[107] FC2: 1, 2 FC3: 1[108], 2[109] FC4: 2 FC5: 6b[110] FC6: 2[111]	IPC1: 1[112] IPC2: 3[113], 5 IPC3: 0	BP: 4, 6, 8[114] OP: 1, 2, 4, 9, 13[115]

within many unable to pay back loans. In 2001 these loans amounted to 12.9 billion yuan with unpaid salaries amounting to 860 million yuan. Indeed many forestry workers have suffered economic losses to the extent that they have slipped below the poverty line e.g. 55000 people in Taijing county of Guizhou Province lost 6 million yuan. In addition, NFCP has created budgetary burdens on some local governments through declining revenues.

[92] 30 million households directly involved in the programme

[93] In Wuqi County, Shaanxi Province, 15000 farmers have shifted their labour activities from farming to construction, transportation and other non-agricultural sector jobs – primarily in more urban locations.

[94] The paper highlights that one outcome of SLCP has been to increase migrant workers and provide a labour surplus that then increases labour availability in urban centres – providing a movement from rural to urban centres – up to 48% in some cases.

[95] SLCP has, in a significant proportion of cases, increased the economic burden on local administration budgets because no taxes are levied on converted cropland areas and central governments provide only partial funding to support the programme at local levels.

[96] For each county, of which there were three, four townships were selected within in which three villages were surveyed resulting in 110-120 households were surveyed per county.

[97] With regards to sampling, there is no description of how households were selected, or indeed, at higher scales how villages within counties were selected. There is therefore no information pertaining to selection bias. We are therefore left to assume that such households and villages will be representative of the region as a whole.

[98] No details pertaining to the survey design, process, analysis or limitations are given.

[99] Mixed impact across socio-economic constituents.

[100] Without the SLCP grain subsidy the survey indicated that 79% of participants believe they would not have enough grain.

[101] SLCP directly focuses on poor areas within the region.

[102] Subsidised conversion of land is viewed as a mechanism by which contribution can be made direct to the local economy and GDP. The paper indicates that SLCP is therefore welcomed by local leaders.

[103] $0.05x10^6$ha/yr cropland to forest, $0.00034x10^6$ha/yr cropland to grassland and $0.072x10^6$ha/yr of barren land afforested

[104] From cropland to forest management.

[105] Forest, carbon, timber provision, watershed services (water protection, flood mitigation)

[106] According to the survey conducted after 6yrs of land conversion 69% of households observed an improvement of the ecological environment which was attributed to improved soil condition and reduced erosion as well as an increase in biodiversity. However, there is no indication given how this was assessed by the participants – what equates to an increase in biodiversity?

[107] SLCP is thought to affect 1.6 million farmers from 345,000 households in Ningxia

[108] This is the case for 10.1% of households

[109] According to the questionnaire off-farm activities includes labour migration to larger townships, a shift to livestock rearing and more time spent on non-sloping cropland.

[110] 10.1% of households indicated that income had increased compared to income levels in the absence of SLCP; however, 68.2% of households reported income declines – the balance being in favour of household income reduction. Looking to the future, long-term payments accruing from 'ecological forests' is calculated to be less than the current level of subsidy: 67 yuan compared to 160 yuan. Significantly, the questionnaire indicated that only 8% of households believe that they WOULD NOT re-convert their land following cessation of compensation, with a further 26% indicating in the affirmative.

[111] 4 million yuan equivalent to US$400000

[112] Only in a perfunctory manner.

[113] According to the questionnaire, 87% of farmers stated that they had not been consulted over SLCP implementation. Moreover, 80% indicated that they felt they were unable to refuse participation in the programme. Indicating a highly statist top-down, command-and-control strategy. The authors contend that this approach has lead to a fragmentation in policies and institutions which is the primary cause for the failure to properly target and interpret economic, environment and social stability.

[114] Land security was a primary issue according to the surveyed households, with only 30% indicating that they felt secure beyond their contract period and 32% feeling secure only within their contract period. A further 30% were unaware of their land rights and 7% indicated that they had no sense of security.

[115] Improve funding arrangements, stakeholder participation in decision-making processes and increase social capital investments in very poor regions.

R7: 1 R8: 1 R9: 2 R11: 1, 3, 5, 7	Xlji) S4: 1, 2, 4 S5: 1, 2, 3, 4, 5, 9 S6: 2 (primary), 1 (secondary)	focusing on the social capital requirements for sustainable farmer participation and off-farm economic development, across an economic and politically isolated group of communities.	M5: 1					
R1: D R2: E Uchida, S Rozelle & J Xu R3: 3 R4: 2009 R5: 1 R6: American Journal of Agricultural Economics R7: 1 R8: 1 R9: 1 R10: 1[116], 2[117], 3[118]	S1: As S2: China S3: Sichuan, Shaanxi and Ganju Provinces S4: 1, 2, 4 S5: 1, 2, 3, 4, 5, 9 S6: 1	The article investigates the impact of the SLCP programme on labour allocation – is there a shift from on-farm to off-farm work – and the impact of the programme on participants' physical and human capital.	M1: 1, 3, 4 M2: 3[119], 4, 6[120] M3: 1, 2 M4: 359 households (2003 survey)[121], 270 households (2005 survey)[122] M5: 1, 4[123]	C1: 1, 4 C2: 1[124]	HSC1: 0 HSC4: 1c[125], 2c[126], 4[127]	NC0: 0	FC0: 1 FC3: 2[128] FC4:2[129] FC5: 1[130], 2, 3[131]	IPC1: 0 1PC3: 0

[116] National Science Foundation of China
[117] Ford Foundation
[118] Agricultural Extension Service of Rhode Island
[119] Panel data set – two household surveys commissioned by China's SFA: 2003 survey collected data concerning 1999 and 2002 and 2005 survey collected data concerning 2004.
[120] Stratified sampling
[121] This figure represents a random sample of households in the programme area. 120 households were sampled per Province.
[122] The figure represents those households followed from the original 359. In 2002 201 were participants and 69 were non-participants. In 2004 230 were participants and 40 were non-participants. The attrition rate from the survey was 24% for participating households and 32% for non-participating households.
[123] Difference-in-Difference (DiD) estimators were adopted to identify variation across households in off-farm labour market participation between participants and non-participants.
[124] The authors highlight a number of limitations: (i) use of labour allocation rather than a more direct measure of welfare and (ii) reliance on individuals recalling information accurately incurring potential recall biases – to an extent the authors attempt to address this latter issue through sub-sampling individuals for re-estimation which is then re-imputed into their analysis.
[125] Small difference between participants and non-participants
[126] Small differences between participants and non-participants
[127] According to the surveyed information younger adult household members are more likely to shift to the off-farm labour market. SLCP positively impacts off-farm employment for more poorly-educated individuals, although education achievement increases the likelihood that individuals will seek off-farm employment.
[128] According to the authors SLCP increased off-farm labour participation and decreased on-farm labour for participants. Off-farm labour also increased for non-participants though not as dramatically. The authors advance the DiD evidence indicates that SLCP promotes structural (that is within the labour market) change by increasing the likelihood that an adult household member will work off-farm.
[129] The article indicates that SLCP participants engage in more off-farm labour activities.

R11: 3, 4, 7		The authors use a survey-based comparative participant/non-participant approach specifically focusing on labour, liquidity and human capital constraints pertaining to rural households and livelihoods.							
R1: E R2: J Li, M W Feldman, S Li & G C Daily R3: 4 R4: 2011 R5: 1 R6: PNAS R7: 1 R8: 1 R9: 1 R10: 1[132], 3[133], 4[134] R11: 3, 4, 8, 9[135]	S1: As S2: China S3: Zhanzhi County, Shannxi Province S4: 1, 2, 4 S5: 1, 2, 3, 4, 5, 9 S6: 1	The article focuses on the impact of the SLCP programme on rural household income. The authors employ survey methods to estimate the effects of PES and associated factors on income streams, the	M1: 1, 3, 4 M2: 3, 6 M3: 1, 2 M4: 20 Villages (15 villages in which houses participate and 5 villages in which houses didn't participate)[136] M5: 1, 3, 4[137]	C1: 1, 2[138] C2: 1[139]	HSC1: 0 HSC4: 2a[140], 3a[141]	NC0:0 NC2: 1[142], 3 ,5[143] NC3: 5b[144]	FC0:1 FC2: 1, 2 FC3: 1[145], 3 FC4: 2, 3[146]	IPC1: 0 IPC2: 3, 5 IPC3:0	BP: 2, 10 OP: 4, 12

[130] The authors suggest that compensation paid by SLCP may be actively reducing liquidity constraints. They argue that this represents the mechanism by which greater off-farm employment is being promoted relative to non-participants.

[131] The paper indicates that the more liquidity constrained a household is prior to programme participation the greater the benefit programme participation has on off-farm employment. Work off-farm increased by 23% for participant households in the lowest quartile.

[132] China National Science Fund

[133] The Nature Conservancy, WWF

[134] University funding: University of Minnesota and Stanford University

[135] In terms of the impact on rural household income

[136] Out of 1484 questionnaires 1078 were returned 929 of which were valid responses – 86%.

[137] Econometric model that considers rural household income related to the endowment of livelihood capital and activities. Changes in Gini coefficient is used to estimate the level of inequality and its decomposition.

[138] The selection of participant and non-participant households is not done on the adoption of strict sample-matching criteria and therefore covariate factors are not entirely controlled for which will impact on the analyses' capacity to differentiate effects that are strictly determined by SLCP influence.

[139] The authors note that there are cross-sectional data limitations with respect to employing cross-sectional data 7yrs post-programme implementation comparing current participant and non-participant households. Also the Gini coefficient does not capture all relevant household economic information of importance to determining livelihood prospects and therefore does not always provide the most nuanced and realistic picture of differences between income streams.

[140] The data indicate that participating households are significantly larger than non-participant households in family size, dependency-ratio and skill level. Moreover, the amount of per capita forest land under participating households is significantly more than that of non-participating households. However, per capita sloping land (SLCP is targeted at sloping land primarily) and farm land is significantly less.

[141] The labour capacity of participating households is greater than non-participating households.

[142] In addition to afforestation of barren land

	degree of income inequality and the socio-economic differences between participant and non-participant households.	

[143] Agricultural conversion

[144] According to the article it appears traditional farming practices are still being employed by farmers even though, as participants, they are required to engage in other activities as well as reduce some of their current practices.

[145] The report indicates that SLCP has had a mixed impact on household income. For participants on low and middle income households the SLCP has had a significantly positive effect on net income. Covariates such as property size and labour effort relating to new farm practices however has a negative impact on income at this economic household level. However, proximity to protected areas seems to positively improve programme economic benefits.

[146] The Gini coefficient data established by the authors seems to indicate that SLCP has decreased income inequality: non-participant Gini coefficients were higher than participant households. The subsidies provided by SLCP decrease income inequality among participants – SLCP would seem to improve social equity. The impact of wages on participant and non-participant household income inequality is distinct.

Table 4 Columbia Case Study

Foundational Aspects					Capital Asset Outputs				Conclusions and Recommendations
Report character	***Study Context***	***Study Focus/Analysis***	***Methods***	***Method Constraints***	***Human/ Social Capital***	***Natural Capital***	***Financial Capital***	***Institutional Capital***	
R1: A R2: S Pagiola, A R Rios & A Arcenas R3: 3 R4: 2010 R5: 1 R6: Environmental Resource Economics R7: 1 R8: 1, 3[147] R9: 1[148] R10: 2[149] R11: 1, 2, 5, 9	S1: SA S2: Columbia S3: Quindío S4: 1, 4 S5: 5, 9 S6: 1, 2, 4	The paper considers the importance of participation of individuals/communities in PES programmes – in particular the factors that determine participation intensity of poorer households. This issue is assessed through an analysis of the RISEMP scheme.	M1: 1. 3. 4 M2: 3[150], 4[151], 5[152] M3: 1, 2 M4: 72 households receiving payment, 29 non-participants M5: 1	C2: 1[153]	HSC1: 1 HSC2; 2 HSC3: 5(*/**)[154] HSC5: 2[155]	NC0: 1 NC1: 3[156] NC2: 4 (**/***)[157] NC3: 1[158], 3[159], 5b NC4: 1, 3[160], 5, 6[161]	FC0: 0 FC1: 3[162] FC2: 1, 2, 3 FC5: 6a[163]	IPC1: 0 IPC3: 0	BP: 1, 2 ,4, 9 OP: 1, 2, 3, 4, 7

147 World Bank and Inter-American Development Bank.
148 In-part
149 Norwegian Trust Fund for Environmentally and Socially Sustainable Development.
150 A baseline survey on household characteristics was conducted in 2002, which was followed in 2004 by a land-use change survey including information on what influenced land-use decision making.
151 The Silvopoastoral project was arranged so that in addition to PES participants the programme also had matched control non-participants (though these were fewer in number). Originally control non-participants were randomly assigned however this was found to be a sub-optimal method of selection as the control group did not provide a fair counterfactual comparison.
152 Farm level maps were prepared annually for both participant and control farms relating the plots to the 28 different land-uses designated under the RISEMP scheme.
153 Little information is given regarding the nature of the surveys, in terms of whether they were questionnaires, semi-structured or structured interviews. Accessibility and eligibility and property right regimes were not part of the participation econometric analysis and so outcomes from the model have to be handled with caution as important parameters that would impact on participation rates are not considered.
154 Low income PES households have less access to environmental services compared to high income PES households, in particular water services and are also more likely to be further away from the nearest urban centre.
155 Low income households contributed to a decline in degraded pasture (approx 35%) as well as improved pasture without trees (45%). Moreover, according to the author's low income households did not simply adopt easier technical practices, frequently converting pastures from a low tree density to a high tree density as well as contributing to the establishment of fodder banks. Low income households concerted 40% of their land to alternative land-use generating a 55% change (i.e. an increase) in the ES Index. Overall, low income households' relative contribution was on a par with middle and high income households. The difference in difference model developed indicates that there are no significant differences in participation rates between PES participant household income groups.
156 2894ha
157 Silvopastoral management practices.
158 Riparian forest increased by 23ha from 369ha in 2003 (prior to project commencement) to 393ha in 2007 (four years into the project).
159 The authors identify a significant reduction in degraded pasture from 78.3ha (2003) to 7.1ha (2007), a significant reduction in natural pasture without trees from 721ha (2003) to 239ha (2007) and improved pasture without trees from 1079ha (2003) to 873ha (2007). Moreover, from 2003 to 2007 the project witnessed significant increases in fodder banks (4.6ha to 27.5ha), improved pasture with low tree density (55ha to 333ha), natural pasture with high tree density (0ha to 68ha), improved pasture with high tree density (2.2ha to 266ha) and live fencing (1.4km to 255km).
160 Delivery assessed through an ES index computed from an aggregate of points awarded to each of 28 land-use types.
161 Overall, the ES index had a percentage change increase of 49.4% as a consequence of the land-use changes undergone.
162 79 households receiving payments
163 Savings, sold animals, sold other assets, NGO projects, and off-farm income generating activities were all more important financial sources for first-year investments in silvopastoral practices by participants that payment from the silvopastoral project.

Table 5. Comparative Latin American Case Studies

Foundational Aspects					Capital Asset Outputs				Conclusions and Recommendations
Report character	***Study Context***	***Study Focus/Analysis***	***Methods***	***Method Constraints***	***Human/ Social Capital***	***Natural Capital***	***Financial Capital***	***Institutional Capital***	
R1: A R2: N Kosoy, M Martinez-Tuna, R Muradian & J Martinez-Alier R3: 4 R4: 2007 R5: 1 R6: Ecological Economics R7: 1 R8: 1 R9: 1 R10: 2[164] R11: 1, 2, 3, 4	S1: CA S2: Costa Rica, Honduras, Nicaragua S3: Heredia (Costa Rica), Jesus de Otoro (Honduras), San Pedro del Norte (Nicaragua) S4: 1, 4 S5: 4, 5 S6: 1, 2 (Primary), 4 (secondary)	The paper considers three PES watershed schemes in operation across Central America. Through a comparative approach the authors seek to identify parallels that could shed light on important issues regarding the design, implementation and impacts of	M1: 1[165], 3, 4 M2: 3[166] M3: 1 M4: Honduras (18 interviews + 117 questionnaires), Costa Rica (7 interviews + 111 questionnaires) and Nicaragua (9 interviews + 65 questionnaires) M5: 1	C2: 1[167]	HSC1: 0	NC0: 1 NC1: 1[168], 2[169] NC2[170]: 1, 2, 3, 4 (*)[171] NC3: 4[172], 5b[173] NC4: 1[174], 2[175], 4[176]	FC0: 1 FC1: 1[177], 2[178] FC5: 5[179]	IPC1: 0 IPC3: 0	BP: 1, 2, 3, 4[180] OP: 4, 11

[164] BBV Foundation
[165] Case study comparisons
[166] Structured questionnaires (users), semi-structured questionnaires (providers and potential providers) and in-depth interviews (key informants)
[167] To an extent the comparative analysis is somewhat flawed as the situational contexts being compared are quite different, so that although superficially like is being compared with like, in actuality the contextual differences in which the PES programmes operate are such that the underlying basis of comparison is not the same. However, having acknowledged this, there is merit in a comparative approach that seeks to identify important design and implementation issues on the basis of differences in PES formulation and adoption.
[168] In Jesus de Otoro (Honduras) the total watershed area is 3180ha (approx. 2226ha of forest) of which up to 200ha (6.29% (total watershed)/8.98% (forested area)) is hoped to be under the payment scheme. At the time of research 22 – 74ha was under payments (2.33% (total watershed)/3.32% (forested area)). In San Pedro del Norte (Nicaragua) the total watershed area is 741ha (approx. 156ha of forest) of which 39ha (3.91% (total watershed/25% (forested area)) was presently under payments.
[169] In Heredia (Costa Rica) the total watershed area is 11340ha (approx. 3855ha of forest) of which 1062ha (9.36% (total watershed)/27.54% (forested area)) has been prioritised but presently (at time of research) only 415ha (3.66% (total watershed)/10.76% (forested area)) were under payment.
[170] These different management strategies were employed across all cases studies; while some employed all practices (e.g. Jesus de Otoro) others employed a couple (e.g. Heredia and San Pedro del Norte). All case studies have restrictions on extractive activities.
[171] Low levels of management practices with regards to the area of the watersheds currently under payments, in all cases studies, was quite low.
[172] Reductions in extractive activities, cattle ranching, livestock raising and crop expansion with movements towards organic agriculture.
[173] The perception that payment is a "support" for activities that they will carry out even if payments were absent is common among providers' pg.452. Ultimately, this questions the additionality value of the PES schemes.
[174] Hydrological services: water quality and quantity (principally) and additional ecosystem service benefits: soil protection, climate regulation, wood, biodiversity and scenery.
[175] Not directly assessed scientifically, although users described a heterogeneous response to the quality of water service delivery, water quality and availability from poor to very positive.
[176] 'The relationship between land uses and hydrological dynamics is probably the most critical technical challenge' – 'there is little knowledge about the effects of tropical forest cover on groundwater flow' pg. 453. Most users were of the opinion that increased forest cover leads to better water quality (85% - 97%) and water quantity (93% - 100%)
[177] In Jesus de Otoro (Honduras) 4 providers were receiving payment at time of fieldwork – subsequently expanded to 18 providers. In San Pedro del Norte (Nicaragua) there were five providers.
[178] In Heredia (Costa Rica) there were 10 providers.
[179] In all three case studies the authors identified that PES contributions to the providers' income stream is less than 2% of gross annual income (0.4 to 1.2% Jesus de Otoro, 0.02% - 0.15% San Pedro del Norte, 0.1 – 21.8% Heredia), which most do not think is a "fair" payment. In fact, in most cases there is at least one order of magnitude difference between actual payment/hectare/yr and that judged to be fair. Overall, the authors identified that the degree of compensation was negative i.e. opportunity costs were not covered. However, they do identify a number of methodological reasons that could explain (to varying extents) the negative compensation finding.
[180] Most users were unaware of the PES scheme

		PES schemes. A considerable part of the article's analysis focuses on determining the magnitude and affect of the relationship between opportunity costs and PES payments. Notably, the paper looks at both provider and user responses in each case study						
R1: B R2: S Novotny Couto Pereira R3: 1 R4: 2010 R5: 1 R6: Journal of Environment & Development R7: 1 R8: 1 R9: 0 R11: 1, 2, 4, 7, 9	S1: SA S2: Bolivia and Brazil S3: NKMCAP[181], Santa Cruz, Bolivia Bolsa Floresta[182], Amazonas State, Brazil S4: 1, 2, 4 S5: 1, 4, 5[183], 9, 10[184]	The article uses two forest-based PES case studies, one from Bolivia and the other Brazil, to explore the environment and development prospects for PES as a new tool to influence conservation-development outcomes.	M1: 6 M5: 1	HSC1: 1 HSC2: 2 HSC3: 2, 3, 5(*) HSC5: 2/3	NC0: 1[185] NC1: 6[186] NC2: 2 (**/***) NC3: 1[187], 4[188], 5a[189] NC4: 1[190], 2[191], 3[192], 4/5[193], 6[194]	FC0: 0 FC1: 5[195], 6[196] FC3: 2[197] FC4: 3[198]	IPC1: 1 IPC2: 3, 4[199], 5/6[200], 8 IPC3: 1[201], 2[202], 3[203]	BP: 2, 6[204], 8[205], 9 OP: 1, 2, 6, 8, 9, 12

[181] Noel Kempff Mercada Climate Action Project is a deforestation avoidance project that functions through the purchasing of logging concessions (primarily), but the programme also seeks to support local communities in gaining property rights and provides technical assistance and capacity building to enable better resource use and improve livelihoods.
[182] Bolsa Floresta is a deforestation avoidance project which works with local people and forest dwellers to create a partnership in which these communities agree not to undertake deforesting activities for rewards and investments in their communities.
[183]Deforestation
[184]Population expansion
[185] To a limited extent with regards to GHG emissions.
[186] In the case of NKMCAP 6400000ha are covered by the scheme. In relation to Bolsa Floresta currently 10 million ha across 14 conservation units are covered by the programme.
[187] Increase in protected area size for each programme and a decrease in deforestation as a consequence of altered natural resource extraction activities within these payment scheme areas and the acquisition and assimilation of logging concessions.
[188] In NKMCAP agricultural activities such as increasing cropping and pasture area are prohibited inside Noel Kempff Park.

	S6: 2, 3	From a social and institutional perspective the paper argues that consideration of the underlying needs of forest-based communities is a necessity for incentive-mechanisms to work, and the common approach of the win-win scenario can occlude the vested interests of developed and developing country

[189] The author questions the true additionality of each programme as the paper identifies that the projects covered forest areas already under some sort of protection – either in terms of being gazetted or where logging is prohibited – thus the risk of deforestation was low.
[190] Carbon/forest services principally, wider provision and regulating services in terms of food and fibre and watershed services also captured by the programme.
[191] In relation to a variety of other services linked to forest protection there is no indication given that studies measuring ecosystem services have been done.
[192] In relation to GHG emission reductions this is the case.
[193] With respect to GHG emissions the linkages between forest protection, avoiding deforestation and emission reductions have an evidential bases. Although in the case study descriptions there is no overt indication of any baseline assessments or individuals surveys to indicate that these programmes carried out such research and understand the linkages between management practice and ecosystem service.
[194] To the extent that emission reductions have been verified – in the case of NKMCAP.
[195]In NKMCAP 237 indigenous communities were affected by the programme.
[196]In Bolsa Floresta 6800 families have been rewarded by the programme.
[197] The paper makes the point that through both programmes focusing on investment in social and physical capital, infrastructure and capacity building ventures these mechanisms have started to provide a wider array of possible income diversification opportunities, alternative labour prospects and therefore potential income streams – particularly as certain agricultural activities are prohibited.
[198] In relation to NKMCAP, the paper indicates that the benefits were not directly accrued by communities. The distribution of funds between concessionaires and communities was unequal. Communities receiving funds, in terms of technical assistance and capacity building, were worth only half the monetary funds gained by concessionaires. Moreover, 49% of all the carbon credits went to central government, out of this amount 20% were accessible to Fundacion Amigos de la Naturaleza as the project implementer the rest going into private hands.
[199] Noel Kempff formed APOCOM to improve social capital institutions and networks and improve overall capacity building. Similarly, in Bolsa Floresta the programme concentrated on initiatives concerning health, education, capacity building and infrastructure. At the outset the programme was designed for improving livelihood prospects and development.
[200] Bolsa Floresta has a wide range of government and private partners.
[201] Not exhaustively but somewhat – primarily from the point of view of how 'open' the institutional arrangements governing the design and implementation of these programmes were to local community opinion and influence.
[202] According to the author since the onset of the project, although communities were not consulted on the proposed projects and their design, there is evidence to indicate that both projects have improved their links with the communities, increased the level of partnership and local participation rates.
[203] From the point of view of design, according to the author in Bolsa Floresta it was only once the programmes 'operational rules' had been defined and determined by higher level institutional elites that forest communities were consulted in workshops to clarify the operational governance rules of the programme. Similarly, in the case of NKMCAP the local communities were disenfranchised from the design process, with no capacity to modify or even reject the proposed project.
[204] Primarily from the perspective of NKMCAP which imposed a number of resource use restrictions. In Bolsa Floresta communities were allowed to continue sustainable productive actions such as fishing.
[205] In Bolsa Floresta communities within conservation units maintained their user-resource rights; however, in NKMCAP there was great ambiguity concerning community rights to access Noel Kempff Park resources potentially compromising livelihoods and increasing the likelihood of off-park leakage. Moreover, with regards to NKMCAP as park sized increased through the acquisition of concessions communities lost their customary rights to the land

Table 6. Costa Rica Case Studies

		institutions and elites.							
		Foundational Aspects			Capital Asset Outputs				Conclusions and Recommendations
Report character	***Study Context***	***Study Focus/Analysis***	***Methods***	***Method Constraints***	***Human/ Social Capital***	***Natural Capital***	***Financial Capital***	***Institutional Capital***	
R1: A R2: M Miranda, I T Porras & M L Moreno R3: 3 R4: 2003 R5: 4 R6: IIED R7: 0 R8: 5 R9: 1 R10: 1, 2 & 3 R11: 1, 3, 7	S1: CA S2: Costa Rica S3: Virilla Watershed in the Central Volcanic Mountain Range Conservation Area S4: 1, 2, 3 & 4 S5: 4, 5, 6, & 10: urbanisation S6: 1, 2	Analysis of the socio-economic impacts of two watershed protection PES projects and one carbon sequestration and watershed conservation project[206]. All PES modalities included.[207] S L Approach.	M1: 1,5 M2: 3 (questionnaire 45 min interviews) M3: 1[208] M4: n=35[209] (participants). Non-participants (n=15) M5: 1	C1:1[210], 4, C2: 1 (face-to-face interview bias) C3: 1	HSC1: 1 HSC2: 2 HSC3:1, 2, 3, 4, 5* and ** 6[211]	NC0:1 NC1: 5 (by 2001) NC2: 1 (low), 2 (low) and 3 (high)[212] NC3: 1[213], 4[214] NC4: 2, 4	FC0: 1 FC1: 4[215] FC2: 3[216] FC3:1[217], 2[218], 3[219] FC4: 1[220]	IPC1: 1 IPC2: 2, 4, 7 IPC3:1, 2, 5, 6	BP: 1, 2, 3, 4, 5, 6, 7 OP: 1, 2, 3, 4, 5
R1: B R2: S Zbinden & D R Lee	S1: CA S2: Costa Rica S3: Los Chiles,	The study focuses on the factors affecting the	M1: 1, 4 M2: 3, 4[221] M3: 1, 2	C1:1[224], 4[225] C2: 1 (face-to-face interview	HSC1: 0 HSC4: 1a[226]. 2a[227], 3	NC0: 0 NC4: 2	FCO: 1 FC2: 3 FC4: 1	IPC1: 0 IPC3: 0	BP: 4, 5, 7, 8, 9 OP: 3, 7

[206] Costa Rica-Norway Reforestation and Forest Conservation AIJ Pilot Project (carbon sequestration); CNFL Project (watershed conservation); Florida Ice & Farm Brewery Project (watershed protection) and Empresa de Servicios Publicos de Heredia and water use charges (watershed protection).
[207] PES modalities: Reforestation (R), Forest Management (F-M) and Forest Protection (F-P)
[208] 65% were not dependent upon the land for livelihoods having off-farm employment
[209] Sample stratified according to number of hectares receiving payments for reforestation, conservation or both and subsequently grouped by farm size: small 1-30ha (n=25), medium 30-80ha (n=5) and large > 80ha (n=5).
[210] 32/35 participants interviewed, 14/15 non-participants interviewed.
[211] FUNDECOR and CNFL provided training for waste management practices and advice on landscape practices. Educational workshops conducted with local communities (70 workshops in 2001 with 2500 children and 23 workshops with 700 staff and parents).
[212] 6% R, 1% F-M and 92% F-P
[213] 1300 hectares planted with a mix of native and exotic species. 497ha have been reforested.
[214] 14 properties involved in reforestation, 2 properties involved in forest management and 7 properties have multiple PES activities.
[215] 114 landowners are receiving payment
[216] 80 per cent of total payments go to landowners on landholdings >80ha
[217] PES is the main income source for 2% of the survey sample and a substantial part of the household budget for 60%. Average payment per property is $4243/yr (range $165/yr – $27,000/yr) (1.5x minimum monthly payment). Less than half of respondents received the additional financial benefits of property tax exemption or better credit facilities.
[218] The inclination is to invest money in farm assets, whether or not payments are being received. In 13% of cases payments go towards the general household budget.
[219] 47% of respondents have employed more on-farm labour after receiving payments
[220] Proportion of PES within Household budget is 4% for properties 30ha and below and approximately 18 – 34% for properties 80ha and above.
[221] Randomized pairing of non-participants with participants subject to decision rules regarding ordinal direction

R3: 2 R4: 2005 R5: 1 R6: World Development R7: 1 R8: 1, 2 R9: 1 R10: 4 (University Institute) R11: 5	San Carlos and Sarapiqui S4: 1, 2, 3, 4 S5: 5, 7, 8 S6: 1, 2	participation of farmers in the PSA programme All PES modalities are included	M4: 133 (participants) and 141 (non-participants)[222] M5:1, 4[223]	bias) C3: 3 (unclear how sample weightings affect the econometric analysis)			FC5: 2, 3[228]		
R1: C R2: R A Hope, I T Porras & M Miranda R3: 3 R4: 2005 R5: 5 R6: DFID R7: 2 R8: 2 R9: 1 R10: 1 (DFID)	S1: CA S2: Costa Rica S3: Arenal Watershed S4: 1, 4 S5: 5, 7[229], 10[230] S6: 1, 2	The study attempts to address the issue of whether PES has the potential to function as a development tool. If PES can mitigate forest conversion whilst being pro-poor and whether	M1: 2, 3, 4[231] M2: 3 M3: 1, 2 M4: 116[232], 7[233] M5: 1, 5 (Conjoint analysis)	C1: 1[234], 3[235] C2: 1 (face-to-face interview bias) C3: 1	HSC1: 0[236]	NC0: 0 NC1: 2[237] NC2: 0[238]	FC0: 1[239] FC1: 0[240] FC5: 4[241], 5[242]	IPC1: 0	BP: 1, 3, 4, 8, 9 OP: 3, 4, 5, 6

[224] It is unclear how the 284 participants are distributed across the 246 surveyed households.
[225] Randomized pairing may not produce the most comparable 'matched partner'.
[226] Participants in F-P and S-M had twice the schooling years compared to non-participants.
[227] Mean land-size for non-participants is 34.9ha, whereas for participants it is 151.6ha and differs for each modality: 85.6ha for R, 169.7ha F-P and 199.7ha S-M
[222] Overall sample size of 284, although the survey was conducted at the household level of which 246 participated; however, it is not clear how this sample is distributed across households. PES participants were stratified according to PES activity: 71/212 FP, 36/151 R and 26/82 SM randomly selected from a government approved list of 445 projects operating from 1997 – 2001.
[223] Econometric model comprises a binary logistic regression modelling landowner decision-making to enter the reforestation programme and a multinomial regression to model decision-making between participation in the forest protection programme or sustainable management programme or both.
[228] 45% of forest conservation and 58% of sustainable management participants stated off-farm income was their primary financial revenue stream.
[229] Hydroelectric dam developments in the Areńal watershed
[230] Demographic shifts associated with changes in agricultural productive activities resulting in land-use pressures.
[231] Conjoint analysis to investigate different PES scenarios and policy strategies was included to identify stated preferences of the sample.
[232] This figure comprises three groups of individuals based on primary livelihood activity: coffee (n=38/75), livestock (n=46/149) and tourism (n=32/99) taken from 8 of 16 communities in the upper catchment area. This represents 36% of the total potential survey sample. These represent non-participants.
[233] One in-depth life history interview and 6 purposive structured questionnaires of participant experiences.
[234] Only 36% of potential surveyed individuals (non-participants) were sampled. Only 7 PES participants were interviewed.
[235] Localised to half the communities in the upper catchment: small spatial distribution.
[236] The social outcomes for PES participants were not assessed. The focus on non-participants concerned the potential for PES uptake.
[237] For the 6 PES participants surveyed, collectively, ~ 235ha were under PES contracts. The type of contract was not reported.
[238] In reference to the PES participants interviewed.
[239] Only partially
[240] In two cases farmers were awaiting payments.
[241] One farmer reported PES represented 50% of household income share.
[242] For two farmers PES represented 20% and 10% of household income share respectively.

R11: 1, 3, 7, 9		funding for PES should be allocated for the purposes of reducing rural poverty.							
R1: D R2: R Sierra & E Russman R3: 2 R4: 2006 R5: 1 R6: Ecological Economics R7: 1 R8: 1 R9: 2 R11: 2, 3	S1: CA S2: Costa Rica S3: Osa Peninsula S4: 1, 4 S5: 1, 5, 7 S6: 1, 4	The study focuses on three areas of Costa Rica's PSA programme: (1) differences between PES and non-PES farmers regarding land-use decisions (2) the contribution of PES to this variation in decision making, and (3) the identification of the on-farm and off-farm conservation impacts of PES. Only F-P PES modality was included in the study.	M1: 1, 4 M2: 1[243], 2[244], 3[245] M3: 1, 2 M4: 30 participant farms and 30 non-participant farms M5: 1, 2	C1: 1[246], 2[247] C2: 1[248]	HSC1: 0	NC0: 1[249] NC3: 3[250], 4[251], 5[252] NC4: 2	FC0: 0	IPC1: 0 IPC3: 0	BP 1, 2, 9 OP: 4, 7
R1: E R2: G A Sanchez-	S1: CA S2: Costa Rica S3: Country-	The paper examines the impact (in	M1: 4 M2: 4[254] M5: 1, 2[255]	C2: 1[256]	HSC1: 0	NC0: 1 NC1: 6[257] NC2: 1 (***)[258],	FC0: 0 FC1: 6[264]	IPC1: 0 IPC3: 0	OP: 7[265]

[243] Data on farm level payment and land cover obtained from a list of beneficiaries (supplied by FONAFIFO), archival research and land tenure information from CEDARENA
[244] Group comparison and OLS regression was used to look at land-use decision-making between PES participants and non-participants.
[245] Personal interviews were conducted.
[246] Of an initial database of 61 farms receiving PES only 30 were included (Farms below 30Ha and above 350Ha were excluded) only 50% sample size. 30/585 non-participants selected (not strictly matched pairs).
[247] Only the F-P PES modality was included other modalities were excluded – does not give a full picture of PES impacts on land-use and cover change.
[248] The model of land-use decision making includes only economic costings thereby excluding other contingent non-economic factors that may substantially affect decision-making. Land cover itself is classified into only four broad categories denying any fine scale ecological and habitat resolution.
[249] Only partially
[250] Non-PES farmers had significantly more land devoted to agriculture (22.6%) compared to PES farmers (7.8%) i.e. PES lead to a reduction in agricultural intensity.
[251] PES farmers had significantly more charral (as a % of land area) on their farms (11.2%) compared to non-PES farmers (2.5%) after 2yrs and 5yrs contract period. No statistical differences were observed in the % of forest present on farms between PES participants and non-participants, at both 2yrs and 5yrs post contract initiation.
[252] The decision model demonstrated that landholders make land-use decisions on the basis of the marginal value of agriculture. Moreover, it established that forest area would not have changed greatly without payments; any gain in forest cover may be temporary or even if permanent would have to be set against marginal gains and losses.

Azofeifa, A Pfaff, J A Robalino & J P Boomhower R3: 4 R4: 2007 R5: 1 R6: Conservation Biology R8: 1 R9: 1 R10: 4 (Research Council) R11: 2, 4	wide S4: 1, 2, 3, 4 S5: 1, 5, 8 S6: 4	ecological spatial terms)[253] of the first phase (1997 – 2000) of the PSA programme. This was achieved by relating payment allocation to the future threat of pejorative land-use changes. All PES modalities considered.			2 (*)[259], 3 (*)[260] NC3: 1[261] 2[262], 5a[263]			
R1: F R2: ? R3: ? R4: 2007 R5: 4 R6: World Bank R7: 0 R8: 3 R9: 1 R10: 3[266]	S1: CA S2: Costa Rica S3: Mesoamerican biological corridor, Tortuguero, Osa Peninsula, country-wide S4: 1, 3, 4	The World Bank document contains the implementation completion and results report for the Ecomarkets project (project approved in 2000 and completed in	No methodology is presented as the report is a collation of information regarding the project's success.	HSC1: 1 HSC2: 2 HSC3: 6[267]	NC0: 1[268] NC1: 6[269] NC2: 2 NC3: 1[270], 2[271] NC4: 1[272], 2, 4[273]	FC0: 0 FC1: 6[274] FC2: 4 (No direct assessment of financial change on poverty alleviation)	IPC1: 1 IPC2: 4[275], 6, 7 IPC3: 1, 4[276]	BP: 1, 2 OP: 2, 3, 7, 9, 10

[254] Spatial locations of all farms involved in the PSA were obtained from FONAFIFO, as was information regarding contract/payment details. Forest cover maps produced for 1986, 1997 and 2000. Five land cover categorizes were mapped (1) forest (canopy closure > 80%) (2) 1986 – 1997 and 1997 – 2000 (deforestation and reforestation) (3) mangroves (4) non-forest (5) cloud/water cover. PSA contract spatial distributions were overlaid with the GIS biophysical layers. Grid cells (5 x 5km, with resolution at 28.5m)

[255] OSL regressions were performed to explain differences in deforestation rates both temporally and spatially based on PSA density, life zones, topology and major market locations.

[256] Land cover categories used are too broad and are not resolved enough to give a nuanced picture of the landscape. Pre-PES incentive schemes are not considered in relation to deforestation prediction. The extent of the temporal comparison of deforestation rates before and after PSA introduction are not comparable.

[257] 300000 ha of primary, secondary and planted forest under PSA during the period 1997 – 2000. Mean project size 102ha (largest 4025ha).

[258] F-P (77.1% (1997), 63.5% (1998), 73.1% (1999), 80.3% (2000))

[264] A total of 3978 contracts we signed over the period 1997-2000 (1531 (1997), 1021 (1998), 925 (1999) and 501 (2000)) – all PES modalities.

[265] The authors suggest that poor targeting of PSA contracts to areas with low levels of deforestation and threatened species may have resulted in the seeming lack of programme success – therefore increased ecological targeting is suggested to improve programme outcomes.

[253] In reference to ecological life zones, hydrological basins, buffer zones around protected areas, planned biological corridors and deforestation fronts.

[259] R (10.9% (1997), 16% (1998), 14.8% (1999), 19.7% (2000))

[260] F-M (11.3% (1997), 20.5% (1998), 12.1% (1999), 0% (2000))

[261] Area of forest increased not detailed but yearly increase in land under PSA is approx 75000ha/yr (1997 – 2000)

[262] Deforestation rate from 1986-1997 estimated at 0.06%/yr and 0.03%/yr from 1997-2000. Only 7.7% of PSA payments were within 1km of all deforestation fronts. Correlation coefficient of 0.16 between total area of farms in the PSA and deforestation rate.

[263] No greater association of PSA contracts with protected areas compared to the wider landscape (7% vs 6.5%). PSA contracts allocated more to basins with little importance for drinking water. Life zone areas under PSA ranged from 4% to 8%, a similar area of conservation areas fell under PSA payments.

[266] Ecomarkets project: World Bank Loan (US$32.6 million) and GEF trust fund grant (US$8 million)

R11: 1, 2, 3, 5	S5: 1, 5, 8 S6: 2, 3, 4	2006). The project functioned at the national level of the PSA programme and had environmental, financial-institutional and social capital objectives.						
R1: G R2: S Pagiola R3: 1 R4: 2008 R5: 1 R6: Ecological Economics R7: 1	S1: CA S2: Costa Rica S3: Country-wide S4: 1, 2, 3, 4 S5: 1, 5, 7, 8 S6:1, 4	The article synthesizes and examines Costa Rica's experience of the PSA programme, from a development and effectiveness	No methodology is presented as the article is a collation of information regarding the programmes present	HSC1: 1 HSC2: 1[277] HSC3: 3	NC0: 1[278] NC1: 6[279] NC2: 1 (*)[280], 2 (***)[281], 3 (*)[282], 4 NC3:1[283], 2[284] NC4: 1[285], 2[286], 4	FC0: 0 FC2: 3 FC4: 1	IPC1: 1 IPC2: 4[287] IPC3: 2[288]	BP: 1, 3, 7 Op: 3, 8, 11

[267] 380 women head of household participating in 2006 compared to 22 in 2000, beyond the 30% increase in women participation objective originally envisaged. 970% increase in indigenous-community-owned lands under the PSA scheme from 2850ha (2000) to 27, 638ha (2006).
[268] Only partially
[269] From 2000 to 2006 130900ha of land were enrolled under conservation contracts in priority areas, surpassing the target of 100000ha.
[270] 50000ha of land enrolled in Tortuguero, La Amistad-Caribe and Osa Conservation Areas. 50000ha of land enrolled in areas of high biological importance as identified by the GRUAS report 1996. Extra land is enrolled outside of GRUAS report highlighted areas. By the end of 2005 270,000ha are under conservation contracts (87% natural forest, 7% forest plantation and 6% sustainable forest management).
[271] 66% reduction in deforestation (derived from Tattenbach (2006) – some controversy regarding the validity of this figure)
[272] Hydrological services, biodiversity and carbon
[273] Ecosystem service delivery not overtly measured linkages between land management activities and hydrological services delivery and biodiversity is assumed e.g. it's suggested that the Ecomarkets project has generated carbon emission reductions benefits worth US$141 million (crudely derived figure).
[274] By the end of 2005 3000 landowners were involved in conservation contracts.
[275] 17 companies (hydropower companies, bottlers, municipal water supply systems, irrigation water users, hotels, agricultural industries) had PES contracts through FONAFIFO at the end of 2005 totally approx US$0.5million/yr
[276] The project developed a revenue-capture mechanism as well as supporting the design and establishment of a trust fund, which functioned to act as a repository and disbursement agent to fund contracts targeting biodiversity conservation post-ante completion of the Ecomarket project lifetime.
[277] Mixed evidence for impacts on social capital outcomes as PSA not designed as a poverty alleviation measure.
[278] Only partially
[279] At the end of 2005 some 270000ha were enrolled in the programme, 18000ha enrolled under contracts with individual water users.
[280] R (Forest plantation accounts for 5% of total area (4% at the end 2005))
[281] F-P accounts for 91% area covered since 1998 and 95% of enrolled area by the end of 2005
[282] S-M (subsequently discontinued after 2002) accounted for 4% of total area (1% by end of 2005).
[283] Mixed results to the extent to which PSA has contributed to a reduction in deforestation rates and the amount of extra forest standing through avoided deforestation.
[284] Mixed results with regards to whether PSA has increased forest cover, even though forest area under PSA by the end of 2005 represents 10% of country's forested area. PSA recipients have obligations to maintain forests, although up to 40% of standing timber above a specified diameter can be harvested.
[285] Biodiversity (30% - 59% depending on definition of active contracts by 2005 were in biodiversity priority areas), Carbon sequestration/storage (21000ha of plantation PSA has contracted between 1998 and 2005 have sequestered 1 million Tc based on a certain sequestration rate), watershed (potentially 644 million m^3/yr of water for consumptive use and 7224 million m^3/yr of water for hydropower production has been conserved through avoided deforestation).
[286] The programme is inefficient in monitoring its effectiveness in generating desired services – impossible to determine the extent to which the PSA programme has successfully generated services.
[287] 11 companies are detailed that have signed up to contracts for the provision of water services covering hydropower producers, agribusinesses, municipal water supplies, bottler and tourism. Conservation International is a partner in the PSA programme for both biodiversity conservation and agro-forestry.
[288] FONAFIFO has developed a standardized Certifiable Tradeable Offset which represents an externally certified1 tonne net reduction in carbon emissions.

R8: 3 R9:1 R10: 3 (World Bank) R11: 4		perspective.	development and success.						
R1: H R2: B Locatelli, V Rojas and Z Salinas R3: 3 R4: 2008 R5: 1 R6: Forest Policy and Economics R7: 1 R8: 2, 5 R9: 1 R10: 1 (Finnida) R11:4, 7	S1: CA S2: Costa Rica S3: Huetar Norte Conservation area S4: 3, 4 S5: 1, 5, 7 S6: 1, 2	The paper evaluates the impacts of reforestation under the PSA on local community development in the North of Costa Rica, focusing specifically on the perceptions of impacts by landowners. Only Reforestation modality concerned.	M1: 5[289] M2: 2, 3[290] M3: 1, 3 M4: 37/132 landowners[291], 14 interviews with NGOs, Environment Ministry and timber industries.	C1: 1[292], 4[293] C2:1[294] C3: 2[295]	HSC1: 1 HSC2: 2 HSC3: 3[296], 4[297], 5 (**)[298]	NC0: 0 NC4: 1, 2[299]	FC0: 0 FC4: 1 FC5: 6a[300], 6b[301]	IPC1: 1 IPC2: 8[302] IPC3: 1[303]	BP: 1, 3[304], 6[305], 9 OP: 2, 4, 9
R1: I R2: A Pfaff, J A	S1: CA S2: Costa Rica	The paper addresses the	M1: 3 M2: 4[306], 5[307]	C1: 2[309] C2: 1[310]	HSC1: 0	NC0: 1[311] NC2: 2	FC0: 0	IPC1:0 IPC3: 0	BP: 3 OP: 4, 7

[289] Evaluation of PSA through a comparison of the current state compared to what would have happened in the absence of PSA (within group comparison).
[290] Multi-criteria analysis integrating fuzzy set theory
[291] Sample stratified according to farm area and landowner main activity.
[292] Only 28% sample intensity. Stratification based on farm area, not on area of farm under PSA.
[293] Not clear whether the potential 132 landowners to be surveyed represents all landowner participants in the province.
[294] No information given concerning interview methodology. Unreliable to hypothesise what a scenario without payment would produce when the current situation is when payments are provided – not a valid counterfactual – as the answer will almost certainly be the activity(ies) would not happen.
[295] It is unclear whether T-tests are an appropriate parametric test for analysing differences between the fuzzy-values obtained as it is not possible to have any value within a delimited range.
[296] 51% of landowners though reforestation commitments increased employment opportunities compared to livestock breeding.
[297] Diversification of land-use activities was found be be highly positive.
[298] 57% of landowners had a positive perception of the environmental benefits. Reforestation and PSA raised beneficiary awareness about forest ecosystems goods and services.
[299] Although ES delivery was not assessed 65% of landowners had implemented measures for conserving biodiversity, ecosystems and/or water. PSA motivated beneficiaries to replant after harvesting (even without payment).
[300] 71% of landowners associated reforestation with long-term financial benefits (though a significant minority were uncertain 29%). Moreover, reforestation and payment did not create a security asset.
[301] 60% of landowners were disappointed because payments did not compensate costs.
[302] A positive impact between landowners and land-economy institutions was indentified. 84% of landowners requested institutional help related to the PSA and received a good response. Forestry sector institutions were strengthened.
[303] Impact on law enforcement was highly positive.
[304] 89% of landowners thought low payment was a source of conflict.
[305] 62% of landowners considered land-use restrictions under PSA to be a source of institutional conflict.
[306] Treated (PSA parcels) vs untreated areas (non-PSA lands) to estimate clearing rates. Nearest-neighbour propensity score matching estimation and nearest-neighbour covariate matching estimations are employed to estimate α (fraction of enrolment) and thereby assess PSA impact on deforestation. Covariate matching is employed to test robustness.

Robalino and G A Sanchez-Azofeifa R3: 3 R4: 2008 R5: 7 (University Working Paper Series) R6: Terry Sanford Institute R7: 2 R8: 1 R9: 2 R11: 2, 4	S3: Country-wide S4: 3, 4 S5: 5 S6: 4	issue of whether PSA payments have significantly lowered deforestation rates, for the period 1997 – 2000, by investigating clearing rates between areas with PSA forest-protection contracts, and those without. Only the F-P modality is considered.	M4: Treated (60 points in PSA parcels which were not cleared) untreated (1710 points outside PSA areas)[308]			NC3: 5[312] NC4: 2			
R1: J R2: Sills E, Arriagada R, Ferraro P, Pattanayak S, Carrasco L, Ortiz E, Cordero S, Caldwell K & Andam K R3: 9 R4: 2008 R5: 2[313] R6: n/a R7: 2 R8: Author affiliations not cited	S1: CA S2: Costa Rica S3:Cantons of Sarapiqui, Guacimo and Pococi S4: 4 S5: 5 S6: 4	The purpose of the book chapter is to evaluate the ecological impact of Costa Rica's PSA programme on land-use by providing evidence to describe the programmes impact on forest cover. The chapter provides both a local provincial analysis at the	M1: 1, 3, 4 M2: 3[316], 4, 5 M3: 1, 2, 4, 5 M4: Provincial sample: 50 (participants), 150 (non-Participants)[317] Regional sample: 252 districts with PSA contracts 1997-1999, 254 districts with no PSA contracts for that period. M5: 1, 2, 3	C1: 1[318] C2: 1[319]	HSC1: 0 HSC4: 1a, 2a	NC0: 1 NC2: 1, 2[320](**) NC3: 1[321], 4, 5a[322] NC4: 2	FCO: 0	IPC1: 0 IPC3: 0	BP: 3, 4, 5, 6 OP: 13[323]

[307] FONAFIFO provide information on the nature and spatial distribution of PSA F-P contracts. Spatial data sets for forest distribution for the years 1986, 1997 and 2000 were used to estimate changes in forest cover, additional maps of urban infrastructure, landscape features and protected areas were also employed.

[309] Only the F-P modality is considered, this is problematic as deforestation rates should be adjusted for the effects of the Reforestation aspect of PSA.

[310] Previous types of incentive programmes and there effects on deforestation rates (or avoided deforestation) are not considered. Prediction so f land-use activity by landowners is overly utilitarian and considers the maximization of utility as the primary and only important factor affecting land-use decision-making. Spatial data only consider pixels within contracted forest polygons; no farm boundary information used.

[311] Only partially

[308] 10,000 randomly selected locations from 51000km² of land ~ 1 location per 5Km. F-P contracts are given only to forested locations. 1882 locations with private forest were identified in 1986, 1770 in 1997 and 1759 in 2000.

[312] The authors find that PSA had a very small impact on deforestation. Deforestation prevented on approx 0.08 to 0.21%/yr of enrolled land.

[313] This is a draft chapter (226th October 2008) – Chapter 9 – prepared for the publication – Ecomarkets: Costa Rica's Experience with Payments for Environmental Services

R9: 1 R10: 1[314], 4[315] R11: 2, 4		farmer level and then a broader regional analysis, thus providing two scales of observation looking at changes in forest cover and deforestation rates during the initial period 1997-2000. Only PSA contracts concerning the forest protection modality are included in the authors' study.							
R1: K R2: C E Smith R3: 1 R4: 2008 R5: 3[324] R6: - R7: 1[325]	S1: CA S2: Costa Rica S3: Esparza (North Puntarenas Province) Durika (South	The focus of the study concerns the capacity of PES to enable climate change adaptive strategies for innovation	M1: 1[326], 3, 4, 6[327] M2: 3[328] M3: Esparza (1) Durika (2, 7) M4: Esparza – 50 (out of 105)	C1: 4[331] C2: 1[332]	HSC1: 1[333] HSC2: 1 HSC3: 1[334], 4[335]	NC0: 1 NC2: 1, 4 (**) NC3: 1[336], 4[337], 5b NC4: 1[338], 2[339], 4	FC0:0	IPC1: 0 IPC3: 0	BP: 4, 9 OP: 1, 2, 4, 9

[316] Qualitative interviews carried out by the authors: landowners (participant and non-participant), representatives of government agencies and intermediary organisations. A quantitative survey was conducted by a hired firm. The contracted firm was to conduct a survey of 50 PSA participants and 150 non-PSA participants. The survey elicited information regarding socio-economic and finca characteristics. The surveys were linked to GPS readings so that these farms could be associated to land-use change maps. Non-PSA sample was determined using pre-matching and propensity scores to find non-PSA fincas with suitable characteristics to PSA-fincas.

[317] This represents the sample for the quantitative survey

[318] As acknowledged by the authors the farmer-level sampling frame was smaller than ideal, to an extent therefore, creating power issues when statistically analysing the data.

[319] It's unclear whether previous land-use trajectories within PSA and non-PSA fincas are accounted for when evaluating the initial 1997-1999 period of PSA operation. Previous land-use management finca histories prior to 1996 could have an important impact on the potential for land-use change during the period of observation and the likelihood of particular farmers taking part in the PES scheme, if this is not accounted for the pattern of observed changes may not be interpreted accurately.

[320] At the Province level the study concerned only the FP modality, whereas at the broader regional level reforestation efforts were taken into account.

[321] At the province scale the authors identified a marginal, though statistically significant effect of the PSA on forest cover of 3 to 10 hectares (smaller than previous estimates taken over the same time frame). As noted by the authors this figure is less than 13 per cent of the average contracted area, as well as being 7 per cent below farm baseline forest cover. Four reasons are proffered to account for this finding: (i) intention to convert (ii) leakage (iii) spill-over and (iv) forest quality being enhanced rather than forest extent. At the regional scale PSA tracts were shown to have resulted in a net gain of 24 to 34 hectares of forest compared to non-PSA tracts. However, this represents less than 2% of average tract size, but more promisingly does represent close to 10% of the contracted area. The important point to note here is that the increase in forest size at the regional scale was due to the rates of reforestation not due to changes in deforestation rates between PSA and non-PSA areas – where gross deforestation rates is approximately the same.

[322] With respect to the time frame under investigation change in forest cover was positive, but very marginal and gross deforestation rates did not differ significantly between contracted and non-contracted areas.

[323] The authors strongly recommend an improvement in identifying and collecting data on suitable comparison regions – more and better quality quantitative and comparative studies using matching methodologies. Improve data collection regarding forest quality, not simply forest cover on and between contracted areas. Improve PSA contract database management for participants and link to forest cover and land-use maps.

[314] National Science Foundation (US)

[315] FONAFIFO

[324] Master's Thesis

R8: 1 R9: - R10: - R11: 1, 2, 7, 10	Puntarenas Province) S4: 1, 4 S5: 1, 4, 5 S6: 2, 4	with regards to land management practices, primarily livestock management, agroforestry and water protection. Essentially, the report is an assessment of the behavioural modification capacity of PES. The study involves a comparative approach, focusing on a CATIE managed PES site and an	PES participants[329] Durika – 5 (out of 30 communal members)[330] M5: 1

[325] Quasi peer review. As a thesis, it would have been reviewed by a committee – this equates to a certain level of peer review analysis, but not to full peer review status.

[326] Esparza PES site is a CATIE managed scheme and the farms are divided between control farms and then two groups of PES participant farmers: those receiving monetary incentives and those receiving technical assistance. This site is then compared to a communally owned site (similar to a commune), Durika, where sustainable agricultural methods are practiced (including methods that combine climate change mitigation and adaptive strategies) but where PES is absent.

[327] Literature review

[328] Survey questionnaire and individual interviews - both conducted in person.

[331] Although there were clear reasons for selecting Espaza as the PES site – primarily associated with the historical data availability – there was no indication that other potential PES areas were considered as possible study locations – raising the question of how typical or atypical is Esparza with regards to the PES experience? Justifying the selection of Esparza from a wider pool of PES areas would add weight to the generality of the conclusions.

[332] I disagree with the exclusion of the control group at the Esparza site. The control group could have offered a valuable insight into whether proximity influences land management practices: do these farmers employ different practices or are they influenced in their management strategies by PES participants. Moreover, I think there remains to a degree a fundamental problem with using Durika as a comparator to analyse the strengths and weaknesses of the CATIE PES model, specifically, with regards to its capacity to encourage climate change adaptation strategies. The contextual differences, topological, altitudinal, biophysical and environmental conditions – in addition to the different motivational drives of these communities are quite stark – in other words there are many covariates that are not controlled for that will affect the implementation of climate adaptation strategies that cannot be accounted for in the present analysis.

[333] Only marginally assessed: the purpose of the paper was to identify whether climate adaptation strategies from a land-use management point of view were incorporated by participating PES farmers not identifying social capital outcomes in terms of rural livelihood improvements.

[334] Farmers identified an increase in the total number of animals they could support, improved health of cattle and 58% stated that they observed an increase in milk production.

[335] According to the paper, all participating farmers had included environmental services into their farming methods, with 96% of farmers surveyed having impleneted some form of water protection on their farms – although the actual extent of this protection is not documented. However, the integration of climate adoption strategies was somewhat less in comparison to the Durika site. Whereas 90% of farmers stated that they 'understood' the nature of climate change and its causes, only 62% of PES participants had long-term climate change plans for their farms, with even fewer acknowledging that it would significantly impact upon their farming activities.

[336] Although the author indicates that all PES participating farmers after one year of project initiation had planted trees on their pasture no other detailed information regarding tree cover is given.

[337] Participating farmers have developed agro-forestry practices, planting grass species, 56% of surveyed farmers employ fodder banks and all farmers use live fences.

[338] Climate change mitigation and water protection

[339] No formal assessment of ESs, however, the research highlights perceptions of ES change: famers have perceived a reduction in soil erosion and increased drought resistance. There are some indications that degraded land decreased by 15.3% in year 1 – although no specific data is used to substantiate this figure.

[329] Out of 136 farms in the Esparza, 105 are associated with the PES programme. Of these 50 were randomly selected to become part of the analysis. No control group participants were included.

[330] Community member inclusion was based on their role within the community. Selection proceeded through stratified random sampling.

		alternatively managed communal site where climate management strategies are in operation, in order to ascertain how well this particular PES project encourages small to medium landholders to increase their adaptive capacity in relation to climate change.						
R1: L R2: R A Arriagada, P J Ferraro, E O Sills, S K Pattanayak and S Cordero R3: 5 R4: 2010 R5: 7[340] R7: 0[341] R8: 1 R9: 1 R10: 1 (NSF), 2 (FONAFIFO),	S1: CA S2: Costa Rica S3: Sarapiqui (Heredia province) S4: 1, 3, 4 S5: 1, 5, 4 S6: 4	The paper examines the impact of PSA effectiveness on increasing forest cover. Two periods are looked at, forest cover from 1986 – 1992 and then from 1992 to 2005. Only the F-P modality is included in the	M1: 1, 2, 3 M2: 3[342], 4[343], 5[344] M3: 1, 2, 5, 7 M4: 50 Participants[345], 150 Non-participants[346] M5: 1, 3	HSC0: 0	NC0: 1[347] NC2: 2 NC3: 1[348] NC4: 2, 4	FC0:1 FC6[349]	IPC1: 0	OP: 7, 11

[340] Unpublished journal manuscript (http://www2.gsu.edu/~wwwcec/docs/Post%20Arriagada%20et%20al.pd)
[341] Manuscript has been commented upon by the authors' colleagues.
[342] Semi-structured interviews, in-depth interviews and household surveys.
[343] Used one-to-one, nearest neighbour covariate matching with replacement with a derivative of the Mahalanobis distance metric alongside a post-matching bias-correction procedure.
[344] Household surveys and farm characteristics were taken for 'treated' and 'control' farms. GPS readings for each farm were taken linked to the land registry in order to create a GIS layer. Aerial photographs were used to identify farm-level land cover differences.
[345] Focused on renewed F-P contracts that were originally signed in 1997-1998 period and still in force in 2005. From a pool of 123 contracts, 70 were renewed from which 50 individuals were randomly selected.
[346] Non-participants were selected via three mechanisms: (i) a sample of immediate neighbours (51 individuals); (ii) a random sample stratified by district of PSA participants (43 landowners); and (iii) a random sample stratified by a buffer region around each PSA parcel (58 landowners).
[347] Only partially
[348] According to the analysis PSA farms gained on average 10.74ha of forest cover (range 8.5 – 12.7ha). Remote sensing indicates that this corresponds to 10 to 15% of mean forest cover on PSA farms in 1992 and 11 to 17% of contracted forest area.
[349] Monetary values presented do not distinguish between contributions, total contributions (Costa Ricans and donors), for the period 1997 – 2005 based on average forest cover gained imply an annual contribution of US$255 – 382.

3 (Conservation International) R11: 2, 4		analysis.							
R1: M R2: T Legrand, G Froger and J-F le Coq R3: 3 R4: 2010 R5: 6 12th BioEcon Conference R7: 1 (2) R8: 1, 2 R9: 1 R10: 3 (French National Agency of Research) R11: 2, 3, 4	S1: CA S2: Costa Rica S3: Country-wide S4:1, 3, 4 S5: 1, 4, 5 S6:1, 4	The conference paper examines the efficiency of the PSA programme to act as a conservation tool, as well as attempting to provide insights as to how the programme may be improved. Primarily considers the F-P PES modality.	M1: 6 M2: 1[350], 3[351]	C1: 1[352], 2[353] C2: 1[354]	HSC0: 0	NC0: 1 NC1: 6[355] NC3: 1[356], 2[357] NC4: 1[358], 2, 4	FC0: 0 FC6: 1[359], 2[360]	IPC1: 1 IPC2: 1, 4, 8 IPC3: 0	BP: 1[361], 2, 3 OP: 4, 7, 11
R1: N R2: A Blackman and R T Woodward	S1: CA S2: Costa Rica S3: Country-wide	The paper focuses on three areas of user financing in the PSA (mainly	M1: 1[362], 5 M2: 1[363], 3[364] M3: 3 M4: 17[365]	C1: 1, 2[366] C2: 1[367]	HSC1: 0	NC0: 1[368] NC1: 3[369] *100% of participants and 75% of non-	FC0: 1 FC4: 1[373] FC6: 1 (2.2 million)[374]	IPC1:0 IPC2: 8[376] IPC3:0	BP: 1, 9 OP: 7

[350] Mainly based on PES literature review
[351] Some interviews (not elaborated upon) were conducted with various actors associated with PSA during the period 2009 and 2010.
[352] No information provided concerning the sample size (i.e. number of people interviewed).
[353] Only the F-P modality is considered, although this is the most favoured modality excluding the other modalities means that a significant area and landowners, companies etc are excluded from the analysis.
[354] No information is given with regards to interview methodology.
[355] 670000ha of forest are under since 1997 (not clear whether this is specific to F-P or all modalities). This figure represents 13% of national territory.
[356] Forest cover has increased from 45% in 1997 to 48% in 2005 (this figure excludes swamp and plantation areas).
[357] Rates of deforestation reduction through F-P (i.e. in contracted areas compared to non-contracted areas) vary from 0.4% (2000 – 2005), 0.2% (1997 – 2000), 38% (avoided deforestation, 1996 – 2000).
[358] Biodiversity (in 2005 30% - 59% of active contracts were within GRUAS conservation priority areas with more than 70% of resources allocated to priority corridors compared to 58% during 1999 - 2002), carbon sequestration (approx 1 million tC sequestered during 1998 – 2005) and hydrological services.
[359] During the period 1997-2009 71 contracts with private companies have been signed.
[360] Implementation of a water tariff is supposed to generate US$5 million/yr.
[361] Transaction costs represent 40% of the total allotted payments.
[362] Part of the analysis involved assessing characteristic differences between participant and non-participant hydropower companies/plants
[363] Information concerning the numbers and types of environmental service users participating was mined from FONAFIFO and literature sources.
[364] Face-to-face interviews (semi-structured) conducted.
[365] 17 owners/managers of 18 companies that owned the 24 active private hydropower plants were interviewed (4 PSA participants, 13 non-PSA participants). The low number of PSA participants is due to some companies owning more than one hydropower plant participating in the PSA and so these are counted once.
[366] Small size with regards to the total number of people interviewed a consequence of only interviewing owners/managers of the plants. This also produces a narrow sample composition giving a restricted institutional perspective.
[367] As pointed out in the article when asked to assess PSA participation perceived benefits there were no mechanisms to accommodate confounding effects resulting from interviewee appeasement i.e. stating overtly environmentally friendly reasons.
[368] From the perspective of accounting for perceptions of programme performance with regards to watershed services.
[369] Negotiated agreements with FONAFIFO: Energia Global/Enel (2000ha protected), Matamoros (750ha), Holcim (1666ha). FONAFIFO/CSAs: Tuis (75ha). Direct payment of water tariff to FONAFIFO: Enel (21ha), Matamorros (24ha)

R3: 2 R4: 2010 R5: 1 R6: Ecological Economics R7: 1 R8: 1, 5 R9: 1 R10: 1 (Cooperative State Research, Education And Extension Service, Hatch Project), 4 (EfD Initiative and Resources for the Future, Fulbright Scholarship, Texas AgriLife Research) R11: 3, 4	S4: 1, 2, 3, 4 S5: 1, 5, 8	from a hydropower perspective): (a) the number and type of users (b) factors affecting participation, and (c) the views of participants regarding programme performance				participants stated that forest protection and provision of ESs were the most important perceived benefits. NC3: 6[370], 7[371] NC4: 1[372], 2	(919000)[375]		
R1: 0 R2: R Cole R3: 1 R4: 2010 R5: 1 R6:	S1: CA S2: Costa Rica S3: Buenos Aires County S4: 4 S5: 5, 9	The study provides an examination of the Systemas Agroforestales (SAF) –	M1:1, 3 M2: 3[377] M3: 1, 2, 4, 6, 7[378] M4: 18 SAF participants[379], 8	C1: 1, 4[380]	HSC1: 1 HSC2: 2[381] HSC3: 1, 3, 5(*), (**) HSC4: 1a[382], 2a, 3a[383]	NC0: 1 NC2: 4 (**) NC3: 1[384], 3[385], 4[386] NC4: 1[387], 2, 4	FC0: 1 FC3: 1[388], 2[389] FC5: 3	IPC1: 1 IPC2: 7, 8 IPC3: 0	BP: 1, 2, 5, 9 OP: 2, 7

[373] Hydropower PSA participants tend to be larger compared to non-participants, have higher revenues (US$ 6.1 million compared to US$ 1.9 million), corporate ownership and greater contact with FONAFIFO. Moreover, the average participant generates 16.2 MW compared to 4.2 MW for non-participants.

[374] This figure represents the contribution from 41 private firms, organisations and individuals. This represents 27% of user financing.

[376] The mean survey respondent reported that programme administration was adequate to good

[370] Survey demonstrated that participating hydropower plants tended to be located in heavily forested and insufficiently protected watersheds.

[371] Non-participating hydropower plants were indicated to be more likely located in heavily forested, heavily protected watersheds or heavily deforested insufficiently protected watershed.

[372] Hydrological services and carbon sequestration. According to the authors 93% of all funds and 78% of private funds targeted hydrological services, the only other service to garner more than 1% of programme funds was carbon sequestration.

[375] This figure represents the contribution of private hydroelectric plants by June 2009. The contribution per plant varies from Enel, Don Pedro US$ 620/yr (water tariff) to Energia Global/Enel US$12000 – 16000/yr (negotiated agreement). Government-owned hydroelectric plants (CNFL and ICE) have contributed ~ US$6 million from 2003 – 2009, and cooperative hydroelectric plants US$22000 over the same period.

[377] Semi-structured interviews using a questionnaire.

[378] Forestry engineers, leaders of development organisations and farmer's associations.

[379] SAF contract list for 2005-2007 was obtained from FONAFIFO. From an original sample of 76 contracts 44 contracts from four communities were selected from which 18 were interviewed, representing a 24% sampling intensity. 2 communities are indigenous reserves and are within protection areas. A third community is located in a buffer zone

[380] Unclear why no attempt was made to contact all 76 originally identified individual contract holders.

[381] Differential impact of payments was identified between communities with Indigenous communities faring better. According to experts this is due to the level of subsistence farming among such communities and the limited opportunities for out-side income streams, thus payments have a higher positive affect.

[382] SAF farmers had an average of 2.3yrs extra education

International Journal of Sustainable Development & World Ecology R7: 1 R8: 1 R9: 1 R10: 1 (NSF), 2 (Marilyn C Davis Foundation), 4 (University fellowship) R11: 1, 2, 4	S6: 2, 4	agroforestry PES modality introduced in 2004 under the PSA. Specifically, the papers assesses the efficiency of the programme with respect to increasing reforestation, the socio-economic and environment impacts based on stakeholder perceptions and the barriers to adoption of agro-forestry practices.	– 12 non-SAF households from which 18 farmers were randomly selected. 10 key informants. M5: 1						
R1: P R2: I Porras R3: 1 R4: 2010	S1: CA S2: Costa Rica S3: Country-wide	The focus of the report is an assessment of the social	M1: 5, 6 M5: 1	C2: 1[390]	HSC1: 1 HSC2: 1[391]	NC0: 1 NC1: 6[392] NC2: 1 (**), 2 (***), 3 (*), 4 (*)	FC0: 1 FC1: 6[393] FC2: 2, 3[394] FC4: 1[395]	IPC0: 1 IPC2: 2, 4[396], 7, 8 IPC3: 1, 5, 6[397]	BP: 1, 2, 5, 6, 8 OP: 3, 5, 7

[383] 33% of SAF recipients had hired outside day-labour for tree planting and plantation maintenance.

[384] SAF farmers planted an average of 2614± 1279 trees/farm in the previous three years compared to 352± 765 for non-participants. Moreover, SAF farmers planted 44 tree species compared to only 22 for non-participants, covering timber species, fruiting species, medical species and others. 90% of all farmers had some timber species growing on their land. Trees planted in forestry blocks mainly on marginal lands. Also, a high proportion of native trees.

[385] 28% farmers reported an improvement in the agro-forestry system

[386] Experts indicated that the main contribution of SAF was to reduce seasonal burning for slash-and-burn agriculture and pasture renovation.

[387] 72% of farmers indicated that tree planting had improved soil quality and reduced soil erosion.

[388] 78% of SAF participants reported an increase in income level. However, only 44% said when yearly payments were taken into account income was only slightly higher.

[389] SAF farmers had a broader spread of farm-based activities compared to non-participants. Nearly half of the landowners receiving payment ranked subsistence farming (44%) as their main economic activity compared to only 6% of non-participants. Main income of non-participants was generated from off-farm work and commercial agriculture.

[390] No direct contact with companies or individual farmers for information regarding payment details was made: information obtained was derived from company websites or national registry which may provide less detailed information that ideally required. In particular, with respect to the limited personal information regarding programme participants; however, this is a constraint identified by the author.

[391] In 2004 the PSA programme purposefully gave increasing priority to cantons with an SDI score below 40 in order to encourage poorer farm participation. Since then 2500 contracts have been allocated to these areas. However, still many of the immediate beneficiaries appeared to have been medium to large landowners. In many cases contract allocation in these regions since 2004 appears to have been demand driven rather than objective driven.

[392] For the period 1997 – 2008: F-P covers 460400ha (new) and 113400ha (renewed), R covers 698000ha, F-M (1997 – 2003) covers 22600ha, Agro-forestry (since 2003) covers 2.3 million trees and natural regeneration (since 2006) covers 3400ha.

[393] From 1997 – 2008 10,008 contracts were signed (of which1073 were renewed). By 2008 private companies had signed 3736 contracts with FONAFIFO, there were 4729 contracts with individual farmers, 203 contracts with indigenous communities with the rest covering group contracts (functioning from 1997 – 2003) and conservation groups/NGOs.

[394] For individual farmers, 61% of contracts have been allocated to land owners with holdings 30ha and above compared to 39% for those with land under 30ha.

[395] In the sense that larger landowners tend to be wealthier and overall larger landholdings are allocated more contracts, particularly F-P contracts. However, to counteract this trend and increase the participation levels of smaller farms (i.e. poorer farmers) agro-forestry contracts were established in 2003 and forest regeneration contracts in 2008. The combined effect has been to increase dramatically smaller (i.e. under 2ha) farms' participation from less than 1% in 1997 to over 5% in 2008; currently FONANFIFO has 350 contracts with properties of this size.

[396] The number of public and private contracts has increased, particularly in the private sector the number of companies has greatly increased in PSA involvement. Since 2003 FONAFIFO has expanded regionally with 7 offices overall.

[397] FONAFIFO issued Environmental Services Certificates (CSA) as a means for companies and/or people to pay for environmental services. In 2004, law 31767 developed the Social Development Index (SDI) to encourage poorer farmer participation. FONAFIFO created the REFORESTA project to increase capacity building through legal arrangement with banks to allow a greater range of properties to participate in the scheme.

R5: 4 R6: IIED R7: 2 R8: 5 R9: 2 R11: 1, 4, 5, 7, 8	S4:1, 2, 3, 5 S5:1, 5, 8 S6: 2	distributional impacts of the PSA programme. Specifically, concentrating on levels of participation (particularly of poorer farmers), measures within the PSA designed to affect social issues, implications of such activities for contract distribution and mechanism to enhance poorer individuals' uptake of the scheme. All PES modalities considered.

Table 7. Ecuador Case Studies

Foundational Aspects					Capital Asset Outputs				Conclusions and Recommendations
Report character	***Study Context***	***Study Focus/Analysis***	***Methods***	***Method Constraints***	***Human/ Social Capital***	***Natural Capital***	***Financial Capital***	***Institutional Capital***	
R1: A R2: M Echavarria, J Vogel, M Albán & F Meneses R3: 4 R4: 2004 R5: 4 R6: IIED R7: 2 R8: 5 R9: 1 R10: 1[398] R11:1, 2, 3, 4	S1: SA S2: Ecuador S3: San Pedro de Pimampiro, Imbabra Province S4: 1, 2, 3, 4 S5: 2, 3, 4, 5 S6: 1, 2, 3, 4	The paper focuses on evaluating the impact of 'emerging' markets for watershed services and its social consequences by consulting with stakeholders involved in the process as well as benefiting from it.	M1: 3, 6 M2: 3[399] M3: 1, 8[400] M4: 11 of the 20 members of the Nueva América Association and 36 individuals from the town of Pimampiro M5: 1	C1: 1, 2, 4 C2: 1 (information regarding interview processes, data analysis and bias correction are not disclosed) C3: 1	HSC1: 0[401]	NC0: 0 NC4: 1[402], 2, 4	FC0: 1[403] FC1: 2[404] FC2: 1, 2, 3 (size of payment area varies but averages 43ha) FC5: 5[405], 6a[406]	IPC0: 0 IPC2: 1, 2	BP: 1, 2/3, 6, 9[407] OP: 4, 6, 7, 9, 10, 11
R1: B R2: S Wunder & M Albán R3: 2 R4: 2008 R5: 1 R6: Ecological Economics R7: 1 R8: 5[408] R9: 1 R10: 3[409]	S1: SA S2: Ecuador S3: Pimampiro (Palavico river upper watershed), PROFAFOR (Pinchincha, Cotapaxi, Chimborazo and coastal Esmeralda	The paper describes two PES cases operating in Ecuador, namely, Pimampiro and PROFAFOR, as examples of PES schemes closest to Wunder's (2005, 2006) theoretical concept.	M1: 2, 3, 6[410] M2: 3[411] M3: 1 M4: ? M5: 1	C1: 1, 2, 3, 4[412] C2: 1[413]	Pimampiro HSC1: 0[414] HSC5: 2/3[415]	NC0: 1 NC1: 2[416] NC3: 1[417], 3[418], 5b NC4: 1[419], 2, 4[420]	FC0: 1[428] FC1: 2 (19) FC2: 1[429], 2[430], 3[431] FC3: 1[432], 2[433] FC4: 2	IPC1: 0 IPC2: 1, 2 IPC3: 0	BP: 1[440], 9, 10[441] OP: 2, 4, 9, 11

[398] DfID
[399] Consultation with stakeholders
[400] General public
[401] According to the report 'measuring aspects of welfare is difficult and speculative'.
[402] Hydrological services (water quality, water quantity, water flow), forest cover and soil erosion
[403] Marginally assessed
[404] In 2001 27-22 families with agreements.
[405] Average payments are US$21.7/month – less than half of family income.
[406] Average payments ranged from US$0.10 to US$1.00/ha. However, the report establishes that the amount considered fair compensation ranges from US$1-10/ha. The report highlights that Pimampiro citizens regarded US$3.70/ha to be fair compensation for landowners. It is obvious that current payments do not meet this level of 'fairness'.
[407] Also in terms of institutional viability which is linked to financial viability.
[408] CIFOR and EcoCiencia
[409] European Union and Swiss Agency for Development and Cooperation
[410] The authors used data from a 2002-2003 socio-economic study conducted for the IIED. The PROFAFOR database was employed to gather primary data on 6 community plantations.
[411] Interviews and community workshops (2205 – 2006).
[412] Specifically with regards to the interview and workshop aspects of the data.
[413] The conduct of workshops and interviews, accounting for bias and group dynamics are not disclosed.

R11: 1, 3, 4	province) S4: 2, 4 S5: 1, 2, 3, 4, (5) S6: 1, 2	Each scheme is discussed from the perspective of design and implementation and outcomes are referenced within a socio-economic perspective. The analysis presents a set of conclusions based on a comparison of the two PES schemes.			PROFAFOR HSC1: 0	NC0: 1 NC1: 6[421] NC2: 1 (+ afforestation) NC3: 1[422], 3[423], 5b[424] NC4: 1[425], 2[426], 4, 5[427]	FC0: 1 FC1: 4[434] FC2: 1[435], 2[436], 3[437] FC3: 1[438] FC4: 1[439]	IPC1: 0 IPC2: 1, 2 IPC3: 0	BP: 1[442], 9 OP: 2, 4, 7, 9, 11
R1: C R2: K A Farley,	S1: SA S2: Ecuador	The paper attempts to	M1: 3, 6 M2: 3[446], 5[447]	C1: 2[448] C2: 1	HSC1: 1 HSC2: 2[449]	NCO: 0 NC2: 1[450], 2[451],	FC0: 0 FC3: 2[455]	IPC1:0 IPC3: 0	BP: 8

[414] Marginally, but mainly from the point of view of financial capital.
[415] 75% of the Nueva América population live under the poverty line and most are in receipt of PES payments.
[416] 550ha by 2005
[417] Deforestation has stopped. Native vegetation has increased as agricultural conversion has reduced from 198ha in 2000 to 88ha in 2005.
[418] Reduction in agricultural intensity.
[419] Hydrological services (water flow, water quality, water quantity, improved drinking water) – connoted to increased forest and vegetative cover.
[420] As the authors highlight: the ways in which potential land-use changes will affect water services within Nueva America has not been studies. There is a lack of scientific evidence to assess additionality in terms of ES delivery.
[428] To an adequate degree.
[429] 10 contracts 5-20ha
[430] 8 contracts 30-90ha
[431] 1 contract 100-190ha
[432] According to the paper, household income on average exceeded opportunity costs resulting in a net household income. However, the authors point out that the data available to them does not allow them to estimate the nature of these gains. Payments average US$252 equivalent to 31% household expenditure.
[433] Medical plant extraction and ecotourism in some cases.
[440] Project start up costs is US$37800. Running transaction costs are US$864/yr (17% of operational costs > split 42% management and 58% monitoring).
[441] The authors note that because the project does not have a proper trust fund the monetary flows could easily be directed towards other ends.
[421] 22287ha
[422] More trees in respect of plantations which represents largely additional tree cover.
[423] Less pasture land.
[424] The authors advance that additionality with regards to PROFAFORs performance is demonstrated, from the perspective of land-use additionality (i.e. not ES additionality), at the plot level and in comparison with disappointing reforestation results elsewhere.
[425] Carbon storage and sequestration.
[426] Values for net sequestration remain controversial due the impact of exotic species plantations in páramos.
[427] Based on: tC/ha > 3-10tC/ha/yr > tCO2=tC*3.67
[434] 162 contracts with private landowners and communities: 102 private owners and 43 communities, with 7 private owners in the coastal province of Esmeralda.
[435] 37 contracts 5-20ha
[436] 43 contracts 30-90ha
[437] 82 contracts 100-600ha
[438] No specific evidence relating to income; however, payments received relate to 6-50% of household expenditure. Tree harvest benefits supposedly give a NPV of US$7-2481 with an IRR of 13-27% - based on some flexible assumptions.
[439] On the basis of contract distribution
[442] Project star-up costs were US$375000 in 1993. Running PES costs up to 2005 were US$293/hA, of which US$17/ha represented transaction costs (monitoring, certification, administration).

W G Anderson, L L Bremer & C P Harden R3: 4 R4: 2011 R5: 1 R6: Environmental Conservation R7: 1 R8: 1 R9: 1 R10: 3[443], 4[444] R11: 1, 2	S3: Nationwide S4: 4 S5: 1, 4, 5, 9 S6: 2, 4	identify, by considering – in general – 9 case studies[445] with extra detail regarding SocioPáramo and Comuna Zuleta, the information gap i.e. analysis of present programme progress by evaluating emerging PES schemes in the Ecuadorian Páramo grasslands. The article attempts to address the issue of 'progress' by considering three inter-related issues: (i) achieving conservation and	M3: 4, 5, 6, 7 M4: 25 Interviewees M5: 1 (qualitative)	C3: 1	HSC3: 2, 3, 4, 5 (*) (**)	3, 5[452] NC4: 1[453], 4[454]	OP: 2, 3, 11[456] *With regards to capital asset 'outcomes' the case studies presented detail more the underlying capital asset goals and aspirations of the schemes as well as mechanisms by which they are to be achieved rather than detailing specific programme 'impacts'. However, if it is stated that a capital asset outcome has been addressed it is so in the sense described above, as well as this 'asset' being highlighted by the authors.

[446] Semi-structured interviews > purposive/stratified sampling – in person – 2009-2010.
[447] Document analysis and archival research
[448] The network centrality of the interviewees is not discussed or disclosed and thus their 'expertise' within the process is not transparent which questions the validity of their responses. It is also questionable as to why PES participants were not interviewed to a get a true-on-the-ground stakeholder perspective, this would to a large degree be able to identify specific smallholder/farmer developments. If PES participants were interviewed this is not made clear.
[449] 6 of the programmes discussed had established socio-economic goals.
[450] Four of the programmes evaluated include re-/afforestation either as a primary tool or a component of land management strategies.
[451] In more than half the programmes there is a link between the PES programme and protected areas (PA), either because the PES programme occurs within a PA or supports a neighbouring PA.
[455] A number of programmes (FONAG, ETAPA, FORAGUA and Comuna Zuleta) sought to enhance household economic activities by providing opportunities for labour activities in plantations, park guards, alpaca raising etc.
[443] National Science Foundation Geography and Special Sciences Programme
[444] San Diego State University Grant Programme
[445] SocioPáramo (National-scale – carbon, water and biodiversity programme), PROFAFOR (national-scale – carbon programme), Comuna Zuleta (Local-scale (Angochagua, Imbabura) – watershed services and carbon programme), Comuna La Esperanza & Municipio de Tulcán (Local – sub-national scale (Tulcán, Carchi) – watershed services programme), Asociacion Nueva América & Municipio de Pimampiro (Local-scale (Pimampiro, Imbabura) – watershed services programme), FONAG – Fondo para la Protección del Agua (Local scale (Quito, Pichincha) – watershed services programme), ETAPA – Acuerdos de Conservación (local-scale (Cuenca, Azuay) – watershed services programme), EMAPA – Pago por Servicios Ambientales (local-scale (Ibarra, Imbabura) – watershed services programme) and FORAGUA – Fondo Regional del Agua (regional-scale (municipios of Loja, El Oro, Zamora-Chinchipe) – watershed services programme).
[452] Prohibition of certain land-uses e.g. burning, grazing, agriculture.
[453] There is a primary focus on hydrological services and carbon (storage and sequestration). Seven of the nine programmes have expectations of providing bundles of ESs which are extended to include biodiversity and scenic beauty.
[454] The report clearly demonstrates that there is no empirical data to support the underlying assumptions regarding management and service output and delivery. Most programmes had not conducted baseline surveys of ecological/biophysical conditions. Given the level of afforestation employment, there is currently no data regarding the impact of afforestation species on the medium and long-term production of ecosystem services.
[456] Require greater monitoring, baseline assessments and the development of appropriate proxy indicators that link land management activities to ecosystem functioning and service production and delivery.

		poverty alleviation, (ii) the production of conservation landscapes (i.e the relationship of PES to the protected area paradigm) and (iii) the production of desired ecosystem services.						
R1: D R2: F de Koning, M Aguiñaga, M Bravo, M Chiu, M Lascano, T Lozada & Lu Suarez R3: 7 R4: 2011 R5: 1 R6: Environmental Science & Policy	S1: SA S2: Ecuador S3: Nationwide S4: 1, 2, 4 S5: 1, 4, 5, 8, 9 S6: 3→5[457], (1, 2, 4)[458]	The article describes Ecuador's Socio Bosque Programme – design, implementation and putative outcomes – and it's function as a mechanism to connect and bridge the somewhat potentially	M1:6 M5: 1	HSC0: 0[459] HSC3: 2, 3, 5 (*) (**) > areas the programme wishes to influence HSC5: 2→3	NC0: 1 NC1: 6[460] NC2: 2(***) NC3: 1[461], 5b NC4: 1[462], 2, 3[463]	FC0:1[464] FC1: 6[465] FC2: 1→ 2[466], 3, 4[467] FC3: 2[468], 4[469] FC4: 3[470]	IPC1: 1 IPC2: 1, 2/3[471], 5, 7 IPC3: 1, 2, 4, 6	BP: 8 OP: 7[472], 11[473]

[457] Programme design and implementation
[458] Somewhat, with respect to a brief discussion of programme results to date
[459] No formal assessment is made, rather the authors identify the ways in which Socio Bosque would hope to influence social capital through poverty alleviation
[460] 5S7503ha: 68730ha under individual families, of which 97% of agreements are for land parcels below 500ha, and 458773ha under communities, of which 81% of agreements are for land parcels above 500ha.
[461] 260000ha/yr of forest have been protected under the scheme
[462] Carbon storage, watershed services (water protection) and biodiversity
[463] With respect to carbon storage – the authors identify a recent study that demonstrated that the Socio Bosque programme had already stored over 5% of the country's biomass and that the various priority areas store significant amounts of carbon.
[464] To a marginal degree, but the analysis presented here is not a more formal economic household account of the impacts of the programme on income streams and the implications of transaction and opportunity costs and the ramifications of payment equity and efficiency.
[465] 1985, number of beneficiaries/sellers benefiting from individual agreements. 60720, number of beneficiaries/sellers benefiting from community agreements.
[466] Mainly with regards to individual landholders
[467] Indigenous communal lands
[468] According to the authors, many individual agreement holders engage in a wide range of productive activities.
[469] Monetary investment is directed to various areas of human, social and physical capital: health, education, family consumption, payment of debts, institutional strengthening and infrastructure.
[470] Only 19% of community agreement families receive more than US$500/yr whereas 92% of individual agreement families receive more than us$500/yr.
[471] Individuals and communities can choose how much land they wish to enrol under the agreement. Signing up to an agreement imposes a certain level of conditionality on the individuals and communities involved with regards to practices and activities that require or must not be undertaken.
[472] Mapping is a process already used, however, the resolution could be improved.
[473] This refers to socio-economic as well as ecological monitoring of various ESs – especially biodiversity – this will increasingly focus on the prospects for REDD+ developments.

R7: 7 R9: 2 R11: 1, 2, 3, 4	divergent agendas of forest conservation and poverty alleviation.

Table 8. Kenya Case Study

Foundational Aspects					Capital Asset Outputs				Conclusions and Recommendations
Report character	***Study Context***	***Study Focus/Analysis***	***Methods***	***Method Constraints***	***Human/ Social Capital***	***Natural Capital***	***Financial Capital***	***Institutional Capital***	
R1: A R2: - R3: - R4: 2010 R5: 7[474] R6: World Bank R7: 0 R8: 3 R9: 1 R10: 3[475] R11: 1, 2, 3, 4, 7	S1: A S2: Kenya S3: western Kenya, selected watersheds within the Nzola, Yala and Nyando river basins S4: 4 S5: 1, 4, 5, 9, 10[476] S6: 1, 2, 3, 4	The document seeks to appraise the Western Kenya Integrated Ecosystem Management Project (WKIEMP)[477]. The document appraisal approach is based on assessing the extent to which the intended project objectives	M1: 3, 6[478] M2: 3[479] M3: 1 M4: 362 (households – economic analysis) Unclear if the beneficiary survey was undertaken on the same households or used a separate sample[480]	C1: 1, 2, 4[481] C2: 1[482]	HSC1: 1 HSC2: 2 HSC3: 1[483], 2[484], 3, 5(*)[485] (**), 6[486] HSC5: 2[487]	NC0: 1 NC1[488]: 3[489] NC2: 1 (**)[490], 4 (**)[491] NC3: 1[492], 3[493], 5b, 8[494] NC4: 1[495], 3[496], 5[497], 7[498]	FC0: 1 FC1[499]: FC3: 1[500], 2 FC5: 3	IPC1: 1 IPC2: 1, 4[501], 7[502], 8[503]	BP: 9[504], 10[505] OP: 1, 2[506], 8[507], 9, 11

[474] A project 'Implementation Completion and Results Report' produced by the World Bank

[475] World Bank

[476] Food security, population expansion and infrastructural developments

[477] The purpose of WKIEMP was ultimately to provide a model for community-driven development projects in western Kenya. It has two principle objectives: to improve land-use productivity and sustainability within selected watersheds by providing on and off-farm support for conservation strategies and improving local community institutional capacity; and to promote a set of management interventions to achieve local and global benefits in terms of biodiversity and carbon sequestration and storage. These objectives are underpinned by four components: (i) capacity building (institutional development and a pilot carbon finance scheme); (ii) scaling up and financing integrated ecosystem management interventions (agro-forestry, green technologies, local training and infrastructure projects); (iii) establishing a monitoring and evaluation system (assessing project outcomes and impacts directly) and (iv) project administration.

[478] The report is principally a synthesis of the available information regarding whether the project met its targets or not.

[479] A component of the report was an economic-financial analysis employing scenarios and discounts rates to work out Net Present Values – this relied on a structured questionnaire administered to a randomly selected number of households from the micro-watersheds within the Nyando, Yala and Nzora rivers. In addition a beneficiary survey was conducted to assess the impact of the project on the community's attitudes, perceptions and experiences over the course of the 5yr life of the project.

[480] Nine focus group discussions across the project area were undertaken.

[481] 362 households were surveyed for the economic analysis component of the report; however, it is not clear whether more than one individual per household was surveyed. Moreover, the compositions of the households – which would have significant bearing on the interpretation of project impacts, are neither detailed nor verifiably included in the analysis. In addition, they note that households were selected randomly; however, the mode of this random selection is not outlined i.e. stratified random sampling.

[482] With regards to the 12% discount rate used for the economic analysis there is no indication given of how this particular figure was arrived at or indeed whether it is a conservative or optimistic value. Furthermore, the economic significance of the calculations rely on control groups acting as a robust counterfactual – however the determination of the control groups is not outlined i.e. whether they are effective control groups. In addition, there is extensive extrapolation from household level figures to project level figures, increasing potential errors and widening uncertainties, as well as demonstrating an over reliance on the underlying assumptions that have to be made for the calculations to 'work'.

[483] Beneficiaries identified food yield and food security as the second largest impact (23% of all impacts identified). Decrease in food deficit months from 9 months (baseline value) to 4.3 months in 2010.

[484] Increased food production had a direct impact on poverty alleviation. The report suggests that nearly 60% of beneficiary households had an increase in production and consumption of food over the period, compared to 34% (31% - 37%) of control households.

[485] 90% of those households sampled gave an overall satisfactory rating for the project.

[486] Gender empowerment – in some cases women formed groups of resource persons training other community members in integrated ecosystem management, others supported those living with HIV/AIDS.

	(developmental as well as environmental) were met through an analysis of the key indicators used to measure progress in these areas. Ultimately the purpose of the document is to give a formal	M5: 1	

[487] 80% of the beneficiaries within the watershed area were farmers – generally poor – although no specific graduation of beneficiary poverty levels is detailed (although in western Kenya over 58% of households reside in absolute poverty i.e. below US$1/day) – originally the project aimed to work within the nine blocks (the area was spatially cleaved in to nine zones) initially designated (each having approx 7500 households). However, after the mid-term review the project concentrated on five blocks, effectively 22500 households of which 4451 households or approx 20% benefitted from the project – equivalent to 20000 beneficiaries. Elsewhere in the report it is stated that over the last five years 7500 households have collaborated with the project approx 40000 people. The exact figure is not clear; nevertheless it remains a fairly significant number of individuals.

[488] The project intervention in the 15 micro-watersheds within the three river basin area represents approx only 2% of the entire watershed

[489] 1820ha reforested for carbon sequestration and 2220ha brought under sustainable forest management.

[490] Beneficiary households are estimated to have planted an average of 400 trees between 2004 and 2009 compared to 127 for control households. Based on 2.6 million tree seedlings planted with a 70% survival rate and a population of 1000 seedlings/ha.

[491] Land-use activities included terracing, ditches, vegetative strips, minimum tillage, improved fallows etc.

[492] 1820ha were reforested from a baseline value of 500ha at the M-d Term Review.

[493] Increase in cash crop (e.g. banana and vegetable) productivity. High adoption rate of tree planting activities among beneficiaries compared to control households e.g. 23% increase in timber and fruit trees, 39% increase in fodder trees and 40% increase in soil fertility trees.

[494] No quantitative measures of biodiversity changes – however the report notes that there were qualitative increases in tree and crop species in and off-farm intervention areas.

[495] Carbon sequestration and storage (climate mitigation), soil erosion and biodiversity

[496] Partially assessed: GHG emissions said to have been reduced through reforestation. No quantitative assessment of biodiversity was undertaken. Beneficiaries indicated that the incidence of observed soil erosion decreased from 60% to 45% - based on an original biophysical baseline survey undertaken in 2006.

[497] Partially linkages understood – with reference to carbon sequestration and storage and reforestation processes. Types of timber species planted, in favourable conditions, can give rise to 15kg of carbon per tree.

[498] Probably in relation to soil erosion and carbon storage/sequestration, with respect to biodiversity the picture is far more uncertain.

[499] With regards to payments WKIEMP does not specifically issue payments, rather household economic benefits arise through income derived from improved land productivity i.e. in terms of increased cash crops and timber species, livelihood diversification, potential carbon finance markets and technical capacity.

[500] The economic analysis calculated that the NPV per household from households adopting intervention strategies, namely, tree planting, crop productivity strategies depending on the scenario used ranges from US$1193 TO us$2844. During the project period of assessment approx US$167000 in net income is thought to have been accrued across households for seedling production efforts.

[501] The project created formal institutional linkages i.e. the technical advisory group and associated committees and informal networks between extension service providers to enhance the community sustainability of promoted activities post-project. Memoranda of understanding were signed between the project and various NGOs.

[502] The report identifies an increase in the number of participatory action plans (PAPs) at the micro-catchment level from 11 (baseline level) to 15 in 2010. Implementation of PAPs increased from 40% in 2008 to 82% in 2010, exceeding the 70% target. Community participation in decision making, planning and evaluation of integrated ecosystem management increased from 75% of households to 90% of households i.e. targeted households. In addition, the report also identifies greater participation of local and regional institutions in coordinating management activities, from 75% (2008 baseline value) to 95% in 2010. A number of Basin Technical and micro-catchment committees have been established.

[503] The report identifies that cross-collaboration between bodies established by the project enabled and fostered greater understanding between local institutions that will contribute to providing further community development capacity.

[504] As the report identifies financial flow constraints undermined the achievements of some aspects of the project, for example 98 sub-projects received programme funds only shortly before project closure, and indeed, another 65 sub-projects projects were not run due to lack of funds. The lack of co-financing funds significantly impacted upon the performance of the project.

[505] The report highlights that the project lacked capacity with regards to dealing with land degradation in certain parts of the broader watershed, and moreover, was unable to extend its interventions to the upstream parts of the watershed.

[506] As the report notes: 'The project gave insufficient focus on linking upstream and downstream interventions in addressing broader ecosystem management aspects'.

[507] The project ran for only five years (2005-2010) its value would have been enhanced by its continuation.

	assessment of the project, assessing its impacts and thereby justifying project funds.	

Table 9. Madagascar Case Studies

Foundational Aspects					Capital Asset Outputs				Conclusions and Recommendations
Report character	***Study Context***	***Study Focus/Analysis***	***Methods***	***Method Constraints***	***Human/ Social Capital***	***Natural Capital***	***Financial Capital***	***Institutional Capital***	
R1: A R2: M Sommerville, E J Milner- Gulland, M Rahajaharison, J P G Jones R3:4 R4: 2010 R5: 1 R6: Conservation Biology R7: 1 R8: 1 R9: 1 R10: 4[508] R11: 2, 4	S1: A S2: Madagascar S3: Menabe S4: 1, 4 S5: 5, 9 S6: 2, 4	The focus of the paper concerns conservation management interventions and their capacity to alter individual behaviour (forest-use behaviours). Specifically, focusing on a community PES intervention scheme, initiated by the Durrell Conservation Trust, and assessing aspects of additionality, influential behavioural factors and community differences.	M1: 1, 3, 4 M2: 3[509] M3: 1 M4: 8 communities receiving payments (n=651), non-recipients (n=213) M5: 1, 3	C1: 4[510] C2: 1[511]	HSC1: 1[512] HSC2: 2[513] HSC3: 5**	NC0: 1[514] NC2: 2(**) NC3: 3[515], 5b[516] NC4: 1[517], 2[518], 5	FC0: 0	IPC1: 1 IPC2: 1, 2 IPC3: 1, 6	BP: 2, 3. 6, 8 OP: 2, 4, 6
R1: B	S1: A	The central	M1: 2, 3, 4	C2: 1[523]	HSC1: 1	NC0: 0	FC0: 1	IPC1: 1	BP: 1, 2, 9

[508] Leverhulme Trust Grant
[509] Structured interviews and self-report concerning past, present and future forest-use practices.
[510] Not clear how non-participant communities and individuals were chosen.
[511] The authors discuss the problem of self-reporting and their methods to constrain the potential biases.
[512] From a behavioural perspective
[513] Interventions in operation within the community had significantly varying effects on individuals' decision-making behaviour with regards to forest resource-use. In participating communities monitoring and environmental outreach were most significant in altering behavioural change. Individuals who changed behaviour on the basis of social reasons were more likely to retain those new behaviours, whereas those adopting alternative forest-use behaviours on the basis of fear had a higher desire to revert to early forest-use activities. Large scale decision-making factors were similar between participating and non-participating communities. Fear was the prime motivating factor for behavioural change, from a monitoring/sanction point of view, and particularly at the local and community-level.
[514] Cursorily so in the context of this investigation.
[515] Reductions observed in agricultural expansion and bushmeat (i.e. lemur) hunting.
[516] Clearly, change was produced but payments were not the prime motivator although inducement in the form of incentivsation improved farmer attitudes towards more positively accepting alternative management activities, fear of sanctions arises from monitoring activities were more important.
[517] Forest protection and biodiversity
[518] Ecosystem services in the form of biodiversity are measured but are not evaluated and presented in this article.

R2: M Sommerville, E J Milner-Gulland, M Rahajaharison, J P G Jones R3: 4 R4: 2010 R5: 1 R6: Ecological Economics R7: 1 R8: 1 R9: 1 R10: 4[519] R11: 1, 4, 8	S2: Madagascar S3: Menabe S4: 1, 4 S5: 5, 9 S6: 2, 3	theoretical notion behind the paper is the assessment of fairness and benefits and how the perceptions of these aspects can affect individual and community participation and therefore programme effectiveness. The paper addresses the distribution of incentives and the implications for perceived fairness and net benefits with regards to a community PES scheme originated by the Durrell Conservation Trust.	M2: 3[520] M3: 1 M4: 8 out of 10 communities participating interviewed. N=656 (structured interviews)[521] and n=55 (semi-structured interviews)[522] M5: 1, 3	HSC2: 2	FC2: 4[524] FC3: 4[525] FC4: 3[526]	IPC2: 1, 2, 4, 7, 8 IPC3: 1, 2[527], 3[528], 6[529]	OP: 2, 4, 7, 12

[523] Self-reporting aspects of the interviews provides an arena for bias and falsification of individual information.
[519] Leverhulme Trust grant
[520] Structured interviews with individuals and semi-structured interviews with focus groups.
[521] Interviews concerned the weighting of costs and benefits of incentive use at the family and community level.
[522] These interviews concerned more institutional governance regime issues.
[524]The authors established that there were community differences in benefits derived from the PES scheme. In some communities due to high agricultural opportunity costs in areas near protected zones individuals expressed that they had undergone a net loss from the PES scheme.
[525] 77% of respondents thought that PES incentives had positively benefitted individuals at the community level. Whereas, only 47% thought that programme incentives benefitted individuals at the family level, 40% thinking it remained unchanged. In some cases, due to contextual reasons as well as perceptions, there were significant differences between community responses to the incentive-based mechanism.
[526] 60% of respondents thought the distribution of incentives was fair, although 29% indicated that they didn't know. Individual status within the community, with regards to decision-making, was influential in perceiving fairness.
[527] 79% of respondents had knowledge of the relationship between actions and incentives and 80% were aware of the work carried out by Durrell.
[528] Those in power perceived the highest net benefit highlighting the potential for elite capture. In some cases poor governance lead to breakdowns in perceived fairness as leadership undermined payment distributive benefits.
[529] There are both strictly protected areas and multi-use zones within the territory of the communities involved in the PES scheme. In the protected areas hunting of lemurs, cutting timber, clearing forests, expanding agriculture are prohibited. Permits are distributed to those individuals in order to use multi-use forests.

Table 10. Mexico Case Studies

Foundational Aspects					Capital Asset Outputs				Conclusions and Recommendations
Report character	***Study Context***	***Study Focus/Analysis***	***Methods***	***Method Constraints***	***Human/ Social Capital***	***Natural Capital***	***Financial Capital***	***Institutional Capital***	
R1: A R2: L R Garcia-Amado, MR Pérez, F R Escuita, S B García & E C Mejía R3: 5 R4: 2011 R5: 1 R6: Ecological Economics R7: 1 R8: 1 R9: 1[530] R10: 3[531] R11:2, 3, 4, 8	S1: CA S2: Mexico S3: Ejido Sierra Morena (La Sepultura Biosphere Reserve, Chiapas) S4: 1, 2, 4 S5: 5 S6: 1, 4	The paper focuses on identifying the influence of PES, in the form of the PSAH scheme, in relation to stakeholder perceptions of benefits derived as well as addressing issues concerning equity and additionality.	M1: 2, 3, 4 M2: 3[532] M3: 1, 4/5, 7 M4: 66 (31 households) ~ 50% of population M5: 1, 2, 3	C2: 1[533]	HSC1: 1 HSC2: 2[534] HSC3: 3, 5(**)[535]	NCO: 1 NC1: 2[536] NC2: 3[537] NC3: 1/2[538], 3[539], 4[540] NC4: 1[541], 2, 4[542]	FC0: 1 FC1: 2[543] FC2: 4[544] FC4: 1[545], 2[546], 3[547] FC5: 6b[548]	IPC1: 1 IPC2: 1, 2[549], 4[550] IPC3: 1, 2, 5[551]	BP: 2, 3, 6, 8, 9 OP: 4, 6
R1: B R2: J Scullion, C	S1: CA S2: Mexico	The paper analyses the	M1: 1, 3, 4[552] M2: 3	C1: 1[555], 2[556] C2: 1[557]	HSC1: 1 HSC2: 1[559]	NC0: 1 NC1: 3[560]	FC0: 1 FC1: 2[564]	IPC1:0 IPC3: 0	BP: 1, 2[566], 3[567], 4

[530] Partially funded
[531] Spanish Cooperation Agency AECID
[532] Key informant interviews, structured questionnaire
[533] No information given regarding the nature of the interviews or the structured questionnaire
[534] The community has received rewards for its conservation work
[535] Cultural services and landscape beauty
[536] Originally 762ha in 2004 expanded to 800ha in 2009
[537] Erosion control terraces
[538] 68%-93% (including land expansion) covers areas with low deforestation risk
[539] Reduction in forest clearing, hunting, poaching and habitat allocation
[540] Reduction in cattle numbers, increased effort direct to surveillance and patrolling
[541] Hydrological services
[542] All respondents agreed that the PES programme had conservation benefits mainly through avoided deforestation and reducing pesticide use
[543] 23 out of 31 households are receiving payment
[544] Payment distribution is based on seniority and property rights. Senior Ejidatarios receive US$826/yr, whereas less senior (newer) ejidatarios residents receive US$550/yr and pobladores the lowest payments around US$138-183/yr.
[545] Payments favour lower income Ejidatarios
[546] Payments favour middle income Pobladores
[547] Payments favour those will formal property rights
[548] PES payments lower the Gini coefficient of both Ejidatarios and Pobladores. 87% of respondents said payments were too low.
[549] Community control, but where the community landowners represent the decision-making apparatus
[550] From 2007 Mexican PES incorporated into PROARBOL, a comprehensive programme that includes a number of PES modalities and development strategies (reforestation, commercial plantations, tourism and certification. Indeed, since 2010 commercial crops such as coffee and palm are now eligible for PES.
[551] Within groups i.e. Ejidatarios and Pobladores but not between groups.
[552] Land cover change analysis using Landsat data, policy intervention impacts through difference-in-difference estimator econometrics and field interviews.

W Thomas, K A Vogt, O Pérez-Maqueo, M G Logsdon R3: 5 R4: 2011 R5: 1 R6: Environmental Conservation R7: 1 R8: 1 R9: 2 R11: 2, 4	S3: Contepec S4: 1, 4 S5: 4, 5 S6: 2, 4	efficacy of the PES model by analysing the effects of two PES programmes (PSAH – the national programme and FIDECOAGUA a municipal programme) on PES participants and regional forest conservation.	M3:1, 2, 4, 7 M4: participants (38)[553] noon-participants (19)[554] M5: 1	C3: 1, 2[558]		NC2: 2(*/**) NC3: 1[561], 2[562], 5a/b[563]	FC5: 5[565]		OP: 4, 5, 7, 11
R1: C R2: N Kosoy, E Corbera, K Brown R3: 3 R4: 2008 R5: 1 R6: Geoforum R7: 1 R8: 1 R9: 1 R10: 4[568]	S1: CA S2: Mexico S3: Lacandon Rainforest, Chiapas S4: 1, 2, 3 S5: 4, 5 S6: 2, 3 An institutional multi-scaled approach	The paper focuses on participation, and looks at the reasons behind the choice to join or decline entering a PES agreement. This is within a common property and institutional context and from	M1: 1 M2: 3[569] M3: 1, 4, 5, 6 M4: 4 (participating Ejidos) 4 (non-participating ejidos)[570]	C1: 1 (n=unknown), 4 C2: 1[571] C3: 1	HSC1: 0	NC0: 1 NC2: 1[572], 2[573] (*) (**) NC4: 1[574], 2	FC0: 1 FC2: 4[575] FC3: 1, 2[576], 3[577] FC5: 5	IPC1: 1 IPC2: 1, 2, 7, 8 IPC3: 0	BP: 1[578], 4, 9 OP: 1[579], 2

[555] No information given regarding the proportion of eligible participants represented by the 38 individuals (is this a small, medium or large fraction?).
[556] Sample composition is not detailed.
[557] No assessment of biodiversity changes (species composition, loss, distribution) is attempted just the assessment of topographical land cover (i.e. forest cover) change. The methodology does not distinguish between the effects of the two different PES programmes in operation, rather they are lumped together, but a more nuanced approach capturing the effects of each programme would have provided greater insight into the aspects of PES the authors are seeking to analyse. Furthermore, the methodology does not address the important issues of leakage and efficacy which would necessarily impact on equity and additionality outcomes, though this is an aspect acknowledged by the authors.
[559] Most respondents stated that the programmes had not improved economic well-being of participants.
[560] 2355ha (total), comprising 1992ha of Cloud Forest (representing ~ 51%) and 363ha of Oak-Pine (representing ~ 70%).
[564] 35 jointly funded by PSAH and FIDECOAGUA
[566] Average opportunity cost of forest land-uses (US$ 30-150ha/yr)
[567] Potential earnings from other alternative livelihood land management activities: Coffee production (US$384ha/yr) and sugar cane plantation (US$2088ha/yr)
[553] Participants were randomly selected from an approved FIDECOAGUA list.
[554] Non-participants were identified via snowball sampling.
[558] Multivariate statistics demonstrating the influence of covariates.
[561] 1997-2009 Pine Oak increased by 120ha or 4.1%/yr. The gain was seen prior to 2003 with 101ha (+63.9%) on participating lands and 82ha (+96.4%) on non-participating lands. Since 2003 Pine Oak has decreased represented by a reduction of 3ha (-1.1%) on participating lands and 60ha (-35.9%) on non-participating lands.
[562] From 1997-2009 there was a net loss of 596ha of cloud forest (combining participant and non-participant lands). This is represented by a loss of 122ha (24ha (-2.1%) pre-2003 and 98ha (-8.8%) post-2003) from participant land compared to the loss of 473ha (112ha (-7.7%) pre-2003 and 363ha (-27.1%) post-2003) from non-participant land.
[563] DiD estimator showed a positive policy impact for PES on participant lands compared to non-PES lands on both pine oak (+34.8%) and cloud forest (+18.3%). Survey work identified mixed results with regards to additionality; indicating that one third of participants did not conserve their forests because of receiving payments, yet another third stipulated that without payments they would convert some of their land to other non-PES land-uses.
[565] PES payments were <3% of total income

R11: 1, 5		the perspective of Mexico's PSA-CABSA scheme.							
R1: D R2: C Muñoz-Piña, A Guevara, J M Torres, J Braña R3: 4 R4: 2008 R5: 1 R6: Ecological Economics R7: 1 R8: 1 R9: 2 R11: 2, 3	S1: CA S2: Mexico S3: Nation-wide S4: 1, 2, 3, 4 S5: 4, 5 S6: 1, 3, 4	The paper aims to give an overview of Mexico's PSAH PES system, both with regards to its development, operation and its output between 2003 and 2006	M1: 6 M5: 1		HSC1: 0	NC0: 1 NC1: 6[580] NC2: 2(**)[581] NC3: 1[582], 6[583] NC4: 1[584], 2, 4	FC0: 1 FC1: 5[585] FC2: 4[586] FC3: 3 FC4: 3[587]	IPC1: 0 IPC2: 1, 3 IPC3: 0	BP: 1, 3, 4, 9 OP: 1, 4, 7, 10, 11
R1: E R2: J Alix-Garcia, A de Janvry, E Sadoulet, J M Torres R3: 4 R4: 2005	S1: CA S2: Mexico S3: Nationwide S4: 1, 2, 3, 4 S5: 4, 5, 8 S6: 1, 2, 3, 4	This report presents an analysis of the first two years of Mexico's PSAH programme, focusing on programme	M1: 3, 6[590] M2: 3[591] M3: 1 M4: (?) M5: 1	C1: 1, 4 C2: 1[592]	HSC1: 1 HSC2: 1/2[593] HSC3: 5(**)	NC0: 1 NC1: 6[594] NC2: 2(**) NC3: 1[595], 4[596], 5a/b[597], 6[598] NC4: 1[599], 2, 4	FC0: 1 FC1: 6 (1259)[600] FC2: 4[601] FC3: 3[602]	IPC1: 1 IPC2: 1, 3, 8 IPC3: 1, 2[603], 3[604], 4, 6	BP: 3, 4, 6 OP:1, 2, 3, 4, 7, 11

[568] Research grant → ICTA-UAB (European Institute)
[569] Mixed methods involving interviews, focus groups, surveys and questionnaires
[570] 18 interviews, 8 focus groups (n=?), 8 questoinnaires, 3-10 surveys/ejidos (Total n=?)
[571] Little methodological detail revealed difficult to assess robustness
[572] In La Corona the community assembly has agreed to reforest 24% of degraded pasture land.
[573] In Peña Blanca money has been received for the development of a private bird reserve. In La Corona the community has been awarded funds to protect 1450ha of fragmented forest.
[574] Carbon and biodiversity (these are the aspects the programme pays for). From an environmental values perspective participants identified climate regulation, watershed protection and scenic beauty as of importance.
[575] A significant proportion of payments have been used to cover labour expenses, business development, extending infrastructural capacity and social developments.
[576] Puerto Bello Metzabok has received its funds for a ecotourism development based on a bird watching site.
[577] Puerto Bello Metzabok: 500,000Mx$/yr (5yrs) > 27000Mx$/household/yr; Peña Blanca: 325,000Mx$/yr (5yrs) > 15500Mx$/household/yr; La Corona: 600,000Mx$/yr (5yrs) > 10500Mx$/household/yr; Reforma Agraria: 618,000Mx$/yr (5yrs). According to the authors PES payments represent more than 10% of on-farm income.
[578] PES Promoter fees can be extortionately high and prohibitory ranging from 20% to 50% of the project design total budget.
[579] The success rate for applications i.e. those approved for implementation ranges from 0.91% to 5.68%!! (calculated from Table 2 in the paper). This low success rate is attributed to applications not being fully complete or applicants not meeting the eligibility criteria yet applying anyway.
[580] Approximately 600,000ha from 2003 – 2005, cumulative area (126800 (2003), 184200 (2004), 169000 (2005) and 118000 (2006)).
[581] Cloud forest represents 10 to 15% of the total accepted forest-type enrolled each year into the PSAH, compared to its national prevalence of 3.4% and an eligible area of 6.6%
[582] The programme has no reported deforestation in participating areas.
[583] In 2003 only 11% of participating forests were from designated high or very high risk of deforestation, in 2004 this increased to 25% but then dropped to 20% in 2005. Only 10% - 25% of PSAH payments have gone to areas with over-exploited aquifers, and only 7% have gone to the most exploited aquifers.
[584] Hydrological services
[585] 879 contracts from 2003 - 2005
[586] 559 contracts went to collective owners (2003 – 2005)
[587] The very highly marginalised are under-represented

R5: 4 R6: N/A[588] R7: 2 R8: 1 R9: 2 R11: 4, 5[589]		development and design, implementation and outcomes and institutional accountability.							
R1: F R2: E Corbera, C González Soberanis, K Brown R3: 3 R4: 2009 R5: 1 R6: Ecological Economics R7: 1 R8: 1 R9: 1 R10: 4[605] R11: 10[606]	S1: CA S2: Mexico S3: Nationwide (Oxaca, Veracruz, Tabasco and Pueblo states) S4: 1, 2, 3, 4 S5: 1, 4, 5 S6: 3	The article assesses Mexico's PSA-CABSA programme (primarily the carbon forestry aspect) from an institutional perspective. The analysis takes a multi-dimensional approach to address the impacts of institutional	M1: 3, 6[607] M2: 3[608] M3: 1, 4, 5, 7 M4: 16 interviews[609], 4 out 7 rural communities receiving carbon payments were chosen as specific case studies (examined by focus groups)[610], 117 semi-	C2: 1[612] C3: 2	HSC1: 1 HSC2: 2 HSC3: 3, 5(*), (**)[613]	NC0: 1 NC1: 3[614] NC2: 1(**), 2, 4 NC3: 1[615], 5 NC4: 1[616], 2[617], 5[618]	FC0: 1 FC1*[619] FC2: 4[620] FC3: 1, 2, 3[621] FC4: 3[622]	IPC1: 1 IPC2: 1, 2/3[623],4[624], 7, 8 IPC3:1, 2, 5	BP: 1[625], 3[626], 4, 8, 9 OP: 1, 2[627], 4, 8, 10

[590] Principally the document is a synthesis of previous work.
[591] Interviews (group and individual) conducted between 2004 and 2005 with selected enrolled Ejidos communities (11 in total) from 6 States.
[592] No information detailing interview methodology
[593] Lack of participation of the most marginalised populations. The correspondence between payments in poverty is generally regarding to be coincidental to the fact that most land enrolled is Ejidos or communicades (80% of Mexican forests are located in these regions) and within these regions 86% of the population would be considered marginalised.
[594] In 2003 169958ha were enrolled with a further 170030ha in 2004.
[595] Most forests in participant lands have a low or very low risk of deforestation and according to the received wisdom would have likely been conserved in the absence of the programme. Only 5 of the 11 Ejidos were deforesting (participating in extractive activities) prior to receiving payments. A large proportion of cloud forest, 6.8% in 2003 and 16.3% in 2004, has been enrolled compared to a national distribution of 3.4%.
[596] Some reductions in cattle infringement in forested areas, reduced firewood extraction and increased levels of surveillance and monitoring have occurred.
[597] Many communities were undertaking conservation activities prior to payments commencing. Potentially, a bias towards communities already undertaking conservation activities exists in the programme design. Also highlighted is the fact that payments were being used to incentivise for mandated conservation activities.
[598] 78% in 2003 and 85% in 2004 of PES hectares were in areas where water scarcity was not an issue, i.e. where aquifers were not over-exploited.
[599] Hydrological services
[600] This number was calculated from data tabularising the annual payment amount (to each Ejidos) and the payment each member would receive (based on the assumption of an equal sharing of the funds), therefore it may well be inaccurate.
[601] Payments were used to invest in infrastructural developments, extra cattle, construction activities and conservation activities.
[602] The highly marginalised were under represented, which questions whether PES reaches the poorest sectors of the community.
[603] Between intermediaries and final service providers
[604] Between clients and final service providers
[588] Academic document prepared for the UNFAO
[589] Viewed from a socio-economic and environmental perspective.
[605] British Academy of Sciences small research grant
[606] Institutional dimensions explored from a socio-economic and governance perspective
[607] Analysis of CONAFOR databases and two early research evaluations of PSA-CABSA (in Spanish)
[608] Interviews/semi-structured interviews and focus groups
[609] Policy makers, academics and NGOs > programme development
[610] A focus group exercise was conducted in each community > exploring community perceptions of PES (ranged in size from 18 to 53 attendees).

		change and development in relation to determining PES effectiveness in delivering ESs.	structured interviews[611] M5: 1						
R1: G R2: J M Alix-Garcia, E N Sahpiro & K R E Sims R3: 3 R4: 2010 R5: 7[628] R6: N/A R7: 2 R8: 1	S1: CA S2: Mexico S3: Nationwide S4: 4[629] S5: 4, 5 S6: 1, 4	The paper investigates, by producing a theoretical-model subsequently applied to real data, the extent to which Mexico's PSAH programme has been effective in	M1: 1[630], 4[631] M2: 2, 4, 5[632] M3: 1, 2 M4: Use the 2004 Cohort of participants though no sample size is given M5: 2, 4	C1: 1, 2[633] C2: 1[634]	HSC1: 0	NC0: 1 NC2: 1, 2 (**) NC3: 1[635], 2[636]	FC0:0	IPC1: 0 IPC3: 0	OP: 5, 11

[612] No detailed information given regarding how interviews were conducted, how biases were negated, how the focus groups functioned with so many individuals and the data was synthesised.
[613] Specifically in terms of capacity building e.g. forest management training course (San Bartolomé Loxicha) and greenhouse establishment (Niños Heroes)
[614] During the period 2004 to 2006 602758ha were under PSA-CABSA, but only 68200ha were in the implementation phase during this period (31448ha in 2004, 29477ha in 2005 and 7281ha in 2006) as opposed to the area included in the project design stage.
[615] A total of 1652ha over the four case study areas have been reforested (this refers to those areas which are under carbon payments): in San Bartolomé Loxicha 66,000 pines (3 species) have been planted on 272ha of commons, in El Volcán del Cofre de Perote 1000ha have been reforested with native pine, in Niños Heroes 100ha has been reforested with Tabebuia rosa and in El Cajón 280ha of commons have been reforested with native pine.
[616] Carbon and biodiversity
[617] At the 5yr stage in San Bartolomé Loxicha 33100 $tCO2_{eq}$, in Orilla del Monte 30624 $tCO2_{eq}$, in Niños Heroes 32752 $tCO2_{eq}$ and in El Cajón 29076 $tCO2_{eq}$
[618] In relation to carbon storage and sequestration
[619] * The total number of individuals receiving payments in each community is not detailed
[620] In San Bartolomé Loxicha the community received 70.57% share of the total investment (2004 – 2007 = Mx$1898821), in Orilla del Monte the community received 38.73% share of the total investment (2004 – 2007 = Mx$485562), in Niños Heroes the community received 77% share of total investment (2004 – 2007 = Mx$1709400) and IN El Cajón the community received 43.66% share of the total investment (2004 – 2007 = Mx$589977).
[621] Assuming equal distribution
[622] A significant proportion of (total) funds were directed towards project design, project valuation and verification, technical assistance and capacity building, anywhere from 22% to 57% (depending upon the case study) and so not directly allocated to the community. Therefore raising some issues with regards to payment equity distribution in relation to whether these activities diminished community benefits.
[623] Local assemblies disbursed funds to the community according to their own institutional decision-making procedural rules.
[624] Interactions with global institutions, this is not always beneficial and with some difficulties arising in difference between global outlooks and local outlooks e.g. in reference to the CDM (Clean Development Mechanism).
[625] Significant amounts of funds were directed towards project design and implementation.
[626] Several interviewees said that carbon payments should increase.
[627] Several interviewees felt that they did not receive sufficient advice from CONAFOR.
[611] CONAFOR officials, intermediaries, local authorities, formal (77 men, 22 women) and informal (4 men and 1 woman) right holders
[628] University working paper series
[629] Partially in relation to PES's theoretical underpinnings but also the negative and important impacts of PES programme slippage, in addition to a short overview of the PSAH scheme.
[630] Environmental effectiveness is measured through the comparison of deforestation rates in PES parcels enrolled in PSAH compared to parcels in control sites
[631]Quantitative assessment of deforestation and slippage based on a theoretical model of household land allocation between forest and agriculture given certain constraints.
[632] Data from the period 2003 - 2006
[633] Unknown in each case, but could affect household choice when it comes to allocations of land between agriculture and forest.
[634] Given the assumptions underlying the econometric model there is still a degree of uncertainty in the conclusions and their robustness. This is also the case for avoided deforestation due to satellite image quality, which the authors acknowledge.
[635] The authors identify that the PSAH programme have reduced the probability of deforestation by 24 – 44% and a decrease amongst deforesters of 2 to 11%
[636] The authors find that the higher the surrounding area an enrolled programme has (with regards to that area also being under the PSAH scheme) increases, significantly, the chances of deforestation occurring in all buffer zones. But the effect is reduced with increasing road density. Furthermore, the authors characterise that this spillage phenomenon arises due to both price and substitution spill-overs.

R9: 2 R11:2, 4	reducing deforestation and the extent of slippage within the programme

Table 11. Mozambique Case Study

Foundational Aspects					Capital Asset Outputs				Conclusions and Recommendations
Report character	***Study Context***	***Study Focus/Analysis***	***Methods***	***Method Constraints***	***Human/ Social Capital***	***Natural Capital***	***Financial Capital***	***Institutional Capital***	
R1: A R2: R Hedge, G Q Bull R3: 2 R4: 2011 R5: 1 R6: Ecological Economics R7: 1 R8: 1, 4 R9: 1 R10: 3[637], 4[638]	S1: A S2: Mozambique S3: Chicale Regulado near Gorongosa National Park (Sofala province) S4: 1, 4 S5: 1, 5 S6: 1	The paper focuses on assessing the financial capital impacts – at the household level – of a small agro-forestry carbon sequestration project[639]. Specifically, the authors look at	M1: 1, 3, 4 M2: 3[640], 4[641], 6[642] M3: 1, 2 M4: 290[643], 96 (participants), 194 (non-participants) M5: 1, 2	C1: 1[644] C2: 1[645]	HSC1: 0[646] HSC4: 1a, 1c, 2a, 2d	NC0:0[647] NC2: 4 (**/***) NC3: 3[648], 4[649] NC4: 1[650]	FC0: 1 FC1:3[651] FC2: 1, 2, 3[652] FC3: 1[653], 2[654], 3[655] FC4: 1[656], 3[657] FC5: 5[658]	IPC1: 0[659] IPC3:0	BP: 1[660], 7 OP: 3, 4[661]

[637] World Bank
[638] University of British Columbia research grant
[639] The Carbon Livelihoods Project.
[640] Questionnaire-based quarterly house-hold survey: integrating environmental resource use, household economic and tree planting data. In addition, two annual household surveys and two annual village surveys were undertaken – one prior to the research and one at the end of the research phase.
[641] To assess the level of household impact (i.e. the average treatment affect on the treated) the authors take a comparative participant vs. non-participant approach. Given the number of differing ways of matching participant and non-participant groups – to form a treatment and control quasi-experimental design, the authors assess a range of different matching methods and compare their outputs – specifically nearest neighbour matching, stratified matching, radius matching and kernel matching.
[642] The authors use decomposition analysis to assess the levels of discrimination across the distribution of economic benefits
[643] This figure represents the total number of households in the sample upon which the analysis focused. This sample is spread across five villages: Nhambrita (18 households), Bue Maria (15 households), Mumhanganha (16 households), Mbalawa (115 households) and Pungue (126 households).
[644] An artefact of the matching process is that the sample size between participant and non-participant is highly different – this can create, due to the number of observations, differences that may in reality be smaller than those identified.
[645] The various matching techniques tested, based on the fact that each has its own advantages as well as limitations, indicates a thorough approach. However, all these matching techniques use the propensity score, computed using Rosenbaum and Rubin's (1983, 1985) method, as their fundamental unit. Producing a propensity score is not without controversy given the information that fails to make it into the index value – which means that although some matching estimates are 'better' than others they all suffer from the same fundamental flaw. It is also not clear how the differences between villages in terms of subsistence level, market accessibility and general wealth was accounted for in regards to defining the economic impacts within the participant group, and between participant and non-participant groups.
[646] In the context of this paper social outcomes were not investigated.
[647] See foot note 10
[648] Tree planting reduced crop production for all households, female-headed households and poor households indicated by reductions in crop values. However, this is was not an unexpected outcome since tree planting likely has this effect. The authors offer no indication that this reduction in crop production produced a concomitant reduction in general household welfare.
[649] The project showed flexibility in land use activities – within certain boundaries landholders could choose which plant species to plant, commercial fruit crops, local fruit species, indigenous timber or a mixture.
[650] Carbon sequestration and storage and biodiversity.
[651] 96 PES households
[652] Landowners of different sizes all receive payments but wealthier landowners are more likely to be in receipt of a PES project than smaller, poorer landowners.
[653] All the matching estimates indicated that participants had higher cash income per capita, and that participants had greater levels of expenditure.
[654] The project encourages community development in the form of a carpentry programme, bee keeping unit, a plant nursery and garden demonstration – this provides full time employment for around 100 people, with some seasonal employment arising through forest fire watch and prevention activities.
[655] One third of the carbon sales revenue is channelled into a community trust fund that builds local capacity and develops community support programmes.
[656] In the sense that wealthier households tend to have more land they can earn higher payments through increased levels of tree planting – particular if their planting is biased towards timber species. Moreover, decomposition analysis indicated that PES projects tend to favour wealthier households

R11: 3, 4, 5	the benefits gained from participating in the project and the distribution of benefits among participants. Economic benefits assessed are direct payments to farmers, direct employment opportunities and potential impact on crop yields.

[657] Amount of PES-income received by male headed households was shown to be higher than female-headed households – in part this is a consequence of female-headed households having smaller landholdings. Decomposition analysis showed that 46% of the difference between female-headed and male-headed households was due to discrimination

[658] Payments accounted for approx 10% of household cash income.

[659] See footnote 10

[660] About 2/3 of revenue from carbon sales is spent on project overheads and transaction costs. Plan Vivo thought to be cost effective, however, it would seem that the overheads suggest otherwise.

[661] Because of the project costs farmers' share of the revenue is not adequate. Splitting of payments into cash payments, community enterprise development and general community development the authors argue may reduce the incentive aspect of the scheme, because individual farm cash income is lower.

Table 12. Nicaraguan Case Studies

Foundational Aspects					Capital Asset Outputs				Conclusions and Recommendations
Report character	***Study Context***	***Study Focus/Analysis***	***Methods***	***Method Constraints***	***Human/ Social Capital***	***Natural Capital***	***Financial Capital***	***Institutional Capital***	
R1: A R2: S Pagiola, E Ramírez, J Gobbi, C de Haan, M Ibrahim, E Muurgueitio, J P Ruíz R3: 7 R4: 2007 R5: 1 R6: Ecological Economics R7: 1 R8: 1, 3, 5 R9: 2 R11: 1, 2, 3, 4	S1: CA S2: Nicaragua S3: Matiguás Río Blanco S4:1, 4 S5: 5 S6:1, 2, 4	The paper provides an overview and analysis of the initial results of the Regional Integrated Silvopastoral[662] Ecosystem Management Project (RISEMP)[663] in Nicaragua. Specifically, detailing program characteristics, structure and operation and then focusing on	M1:1[664], 3, 4, 6 M2: 2, 3[665], 5[666] M3: 1 M4: ? M5: 1	C1: 1, 2, 3 C2: 1[667]	HSC1: 0[668] HSC5: 2[669]	NC0: 1 NC1: 3[670] NC2: 3, 4[671] (**/***)[672] NC3: 1[673], 3[674], 4[675], 5b NC4: 1[676], 3[677], 4/5, 6[678]	FC0: 1[679] FC1: 4[680] FC3: 1[681]	IPC1: 0 IPC3: 0	BP: 1, 9 OP: 8, 9, 10

[662] Silvopastoral management practices focus on planting shrubs, trees and legumes on degraded pasture to improve the environmental condition for animal nutrition and other additive uses. The underlying notion is that such management practices could also improve specific ecosystem services flows whilst providing a reasonable alternative income generating suite of activities.
[663] This programme also operates in Columbia and Costa Rica.
[664] Originally a comparative study, however, the authors excluded the control group on the grounds they were poorly chosen and could therefore not offer a suitable control sample.
[665] Pre-project survey to define household characteristics (conducted in 2002) and a land-use survey to assess landscape-scale changes (conducted in 2004).
[666] Remote-sensing land-use maps prepared annually for each farm.
[667] No information regarding survey methods, the resolution and accuracy of remote-sensing data and the link between the spatial mapping data and land-use activity from which the service delivery is estimated.
[668] According to the authors it is too soon tell.
[669] The authors note that poor and extremely poor households accounted for a significant component of land-use changes e.g. contributing towards a 50% reduction in degraded pasture and a 58% decline in annual crops.And moreover, that 71% of fodder banks and 64% of high tree density pasture was established by poorer farmers.
[670] Total area 3139 ha
[671] Silvopastoral management practices.
[672] Results indicate that substantial land-use changes were made that affecting over 24% of the total area in the first two years (2003 to 2005).
[673] In 2003 there were 627.9ha of secondary and riparian forest which increased to 657ha by 2005.
[674] The area used for annual crops was reduced by 52%, from 231ha (2003) to 111ha (2005), and degraded pasture was reduced by 68% from 868ha (2003) to 281ha (2005).
[675] Pastures with low tree density had a net increase of 19% and those with a high tree density a 23% increase. Fodder bank area increased from 88ha to 192ha and live fence area when from 128km to 323km (a 160% increase).
[676] Biodiversity and carbon storage and sequestration
[677] Environmental services index (ESI) has been developed to give an indication of the extent to which services have and are being delivered. The ESI is an aggregate score derived from up to 28 different land uses (not all apply to a specific area) and their capacity to generate services, and is calculated from a biodiversity index score and a carbon sequestration index score. Each land use is given an individual score based on service delivery potential. The ESI score is then based on the extent to which different land-uses have been adopted or reduced over time.
[678] Total ESI score for participants increased by 42%. Birds are used as a proxy for biodiversity monitoring. 151 species (including 29 species of conservation importance) were identified in project areas, many were forest dependent (<33%).
[679] Only very tentatively discussed
[680] Budgetary constraints meant that only 100 or so households could participate.
[681] Some evidence that milk production and stocking rates have increased which would translate into higher income generation.

		environmental and socio-economic impacts.							
R1: B R2: G Van Hecken & J Bastiaensen R3: 2 R4: 2010 R5: 1 R6: Development and Change R7: 1 R8: 1 R9: 1 R10: 4[682] R11: 4[683]	S1: CA S2: Nicaragua S3: Matiguás-Rio Blanco (two micro-watersheds) S4: 1, 4 S5:5 S6: 1, 2, 4	The paper focuses on three issues (i) addressing the PES literature (ii) analysing a PES case study and (iii) addressing the wider implications the case study has for PES. The case study example performs a quasi-experimental analysis of the	M1:1, 3, 6[684] M2: 2, 3[685] M3: 1, 2 M4: 123 households split into three groups[686]: PES (28), PES + TA[687] (70) and Control (25) 35 in-depth interviews with participants In-depth	C1: 4[688] C2: 1[689]	HSC1: 1 HSC2: 2 HSC3: 5(**)	NC0: 1 NC1: 3[690] NC2: 3, 4[691] (**/***) NC3: 4[692], 5a[693]/b[694] NC4: 1[695], 3[696], 4/5, 6	FC0: 1 FC1: 3[697] FC2: 1, 2 FC4: 1[698] FC5: 5, 6b[699]	IPC1: 0[700]	BP: 1[701], 2, 8 OP: 2, 3, 4, 7

[682] University research grant
[683] Impacts of PES adoption, from a socio-economic and environmental perspective
[684] Synthesising information from previous surveys and databases
[685] In-depth interviews
[686] 123 households (predominantly small to medium-sized farmers) split into different treatment groups. The groups contain both poor farmers (campesinos pobres con tierra CPT: approx 20ha land/household lacking capital to invest), an intermediate group (campesinos ganaderos CG: approx 20 – 50ha land/household with 20 – 100 animals) and a rich group (finqueros ganaderos FG: approx 150 to 250ha land/household with 200 – 300 animals).
[687] Technical assistance: monthly workshops, farm visits and exchange of experiences and advice.
[688] Selection of control group is problematic as their composition is very different from the other two groups, this is acknowledged by the authors, although from an analysis point of view firm distinctions and conclusions are harder to derive and make.
[689] Details regarding the exact nature and way the in-depth interviews were conducted are absent.
[690] No actual figure is given. 3059ha is based on the multiplication of those involved in PES by their average household area. This is obviously an estimate, standard deviations are high and it assumes that all household area is enrolled.
[691] Silvopastoral management – a 'system [that] integrates trees into livestock systems for multiple purposes including soil amelioration, shade, fodder, fruit, wood, and habitat for fauna' Dagang and Nair (2003: 149) in G van Hecken & J Bastiasensen (2010).
[692] Observing the 123 households together during 2003 – 2007 crops (annual, garins, tubers), semi-permanent crops and degraded pasture all decreased significantly, -187ha, -19ha and -881ha respectively. Natural pasture with trees, improved pasture with trees, fodder banks and secondary forest all increase, +169ha, +621ha, + 220ha and + 22ha respectively.
[693] PES and PES+TA groups had a 5.5% further reduction in crop cultivation, more total pasture, more improved pasture with trees and less living fences than the control group. Differences in the extent of some of the management practice adopted were observed according to social-class/wealth category – some of which is explained by capital constraints and labour limitations and land abundance. Although all farmers invested in improved pastures and fodder banks.
[694] With respect to degraded pasture, fodder banks and natural pasture with trees there was little difference between PES participants and non-participants. According to interviews farmers claimed that alternative practices adopted during the project would have occurred anyway it was just that the projected promoted their uptake at a quicker rate. Moreover, although payments were welcome they farmers claimed they were not decisive. Thus begging the question of the programmes claims to provide measurable additionality
[695] Carbon and Biodiversity
[696] ESI
[697] 98 households receiving payments between the PES and the PES + TA group.
[698] Transaction costs increased the likelihood that poorer farmers had a higher probability of being excluded from the process.
[699] In the sense that for most payments weren't the most important factor then by default they were not enough to supply an alternative income stream although they may have been a nice addition to overall income.
[700] Not specifically assessed, but some suggestion that depending upon the location of the RISEMP project it had the potential to erode social institutions or to build-upon existing strong local institutions and increase their capacity.
[701] Establishment of silvopastoral practices ranged from US$170/ha (sowing improved pasture on degraded pasture) to US$390/ha for conversion of degraded into improved pasture with a high tree density.

		RISEMP project and aims to assess whether programme adoption of silvopastoral practices can be attributed to PES.	interviews with project staff (n=?)						
R1: C R2: J Hack R3: 1 R4: 2010 R5: 1 R6: Advances in Geosciences R7: 1 R8: 1 R9: 1 R10: 3[702] R11:5, 7, 9	S1: CA S2: Nicaragua S3: Belén S4: 1, 4 S5: 5 S6: 2, 4	The paper presents a preliminary analysis of the Gil González Catchment project[703], specifically focusing on sustainable environmental conservation, poverty reduction and integrated water management perspectives.	M1: 3 M2: 1[704], 3[705] M3: 1[706] M4: ? M5: 1	C1: 1, 2, 4[707] C2: 1[708] C3: 1	HSSC1: 1 HSC2: 1/2[709]	NC0: 1 NC1: 2[710] NC2: 1, 2 (*/**) NC3: 1[711], 3, 5a/b[712] NC4: 1[713], 3, 4	FC0: 1 FC1: 2[714] FC5: 6b	IPC1: 0 ICP2: 6, 7, 8	BP: 2, 3, 8 OP:4, 5, 9, 10, 11

[702] GTZ National Programme 'Sustainable Natural Resource Management and Formation of Entrepreneurial Capacities'.
[703] This is a PILOT public-private partnership which aims to reforest 800ha of the upper Gonzalez catchment, establish defined areas for cultivation and protection for ecosystem service provision and generate alternative income streams for rural development.
[704] Use of multiple socio-economic databases
[705] Two field surveys
[706] This is a presumption as the actual composition of surveyed individuals is not detailed.
[707] The robustness of the database data is not detailed. The sample size, composition and selection strategy for the survey data is not disclosed.
[708] No methodology regarding how interview data was obtained or how the socio-economic data was subsequently processed having been retrieved from the various databases.
[709] As a stable payment system and as reforestation would provide future benefits the PES scheme was regarded favourably.
[710] 200ha, although the area under payments detailed in the results table is given as 109ha.
[711] Of the 200ha currently under protection reforestation is taking place but the number of hectares reforested is not detailed.
[712] Only a quarter of the proposed 800ha is currently under protection. Water quality aspects are not equally addressed. A quarter of the beneficiaries acknowledged that they would be still undertaking reforestation activities without payments. Half of the beneficiaries would include more land into the payment scheme.
[713] Hydrological services (water quantity and water quality)
[714] 28 beneficiaries

Table 13. Programme Operation and Implementation Arrangements – Fully Annotated

Country & Programme	Environmental Conditions	ESs Considered	PES Modality	PES Modality Criteria	Land-use ES link	Environmental Legislation	Programme Activity	Programme Permanence	Spatial Extent (Ha)
Costa Rica **PSA (National programme)**	2[715], 3[716] ,4	1, 2, 3, 4, 7[717]	(i) FP[718] (ii) R[719] (iii) NFR[720] (iv) Agro-forestry[721] (v) FM[722]	FP[723] R[724] NFR[725]: Agro-forestry[726] FM[727] (Daniels et al 2010)	1	No PES Law Fourth Forestry Law 7575[728] Law 31767[729]	0	4[730]	670000[731]
Mexico **PSAH (National programme)**	1, 4, 5, 6, 9	1	FP and R Commercial crop plantations and certification[732]	Not indicated	1	No PES Law General Law for Sustainable Forest Development (2003) Article 223 of Mexico's Law of Rights[733]	0	3[734]	2.27 million[735]

[715] Montane areas.
[716] Pasture, agricultural fields, fruit orchards, charral (Sierra and Russman 2006)
[717] Scenic beauty
[718] F-P (Forest Protection) dates from 1997. The programme is still in operation, and from 2009 has four variants: (i) Protection in wildlife protected areas (ii) Protection of hydrological services (iii) Protection of forest and (iv) Protection of conservation blanks (Legrand et al. 2010).
[719] R (Reforestation) dates from 1997 and is still in operation.
[720] NFR (Natural Forest Regeneration) dates from 2005 and is still in operation. The programme has three variants: (i) Natural regeneration with production potential (ii) Natural regeneration in pastures and (iii) Natural regeneration in Kyoto land (Daniels et al 2010; Legrand et al 2010).
[721] Agro-forestry has been in operation since 2003.
[722] F-M (Forest Management) dates from 1997 but was only in operation until 2002.
[723] 2 to 300ha enrolled. 600 ha for indigenous areas.
[724] 1 to 300ha enrolled
[725] Minimum of 2ha.
[726] 350 to 3500 trees per participant. 336,000 trees for a joint project
[727] Specific criteria determined by the conservation area.
[728] Instituted in 1996 this law represents the enabling legislation that allowed the introduction of the PSA programme (Daniels et al 2010).
[729] Instituted in 2004 this law introduced the Social Development Index as a means to encourage poorer farmer participation (Porras 2010).
[730] PSA programme has been active since 1997.
[731] For the period 1997-2008 according to Legrand et al. (2010). Daniels et al. (2010) has a more specific figure of 668,369ha. Both sets of figures include contract renewals.
[732] Since 2007 Mexico's PES activities have been incorporated into the PROARBOL programme which now includes commercial crop plantations as an eligible PES component.
[733] Collective these legal adjustments created the Mexican Forestry Fund as the financial instrument to establish an incentive-based conservation system and allowed a levy on national water tax payments to be introduced.
[734] Active since 2003
[735] Cumulatively enrolled between 2003 and 2009

Mexico	1, 4, 5, 6, 9	2, 3	FP, R	Early rules 2004[736]	1	No PES Law	0	3[739]	671000[740]
PSA-CABSA (National programme)				Rule change 2006-2007[737]		The National Rural Agreement (2003)[738]			
Mexico	2, 5, 6	1, 3	FP, R	Not indicated	1	No PES Law	1	3[741]	2335[742]
Fidecoagua(Municipal programme)									
Nicaragua	3[743] 4, 9	2, 3	Agro-forestry[744]	Location	1	No PES Law	1	3[745]	3139
RISEMP (part of a trans-national programme)				Herd size					
Nicaragua	1, 3[746] 9	1	R, FP	Not indicated	1	No PES Law	0	3	200
PPSA-H (local programme)						National Water Law (2007)			
Nicaragua	1, 4	1[747]	1, 2, 4[748]	Not indicated	1	No PES Law	1	4[749]	39
San Pedro del Norte (PASOLAC)									
Ecuador	2, 3[750] 5, 6, 8	1, 2	2, 3[751]	Not indicated	0/1	No PES Law	0	3[753]	550 (in 2005)[754]
Pimampiro						1972 Water law, 1973 Special Decree No.40, 1994 Special			

[736] Eligibility rules included: No payments received from the PSAH scheme, proof of property rights, forest management plan, PES area must be one listed as eligible by CONAFOR (Kosoy et al 2008)
[737] During this period all PES schemes were integrated under a single rubric of payments for forest services and with this integration specific rules changed or were introduced. Carbon payments eligibility required a minimum area of 500ha to a maximum of 3000ha for a project, and must have be absent of tree cover since 1990, with an annual sequestration rate of 8000 tCO2eq. Biodiversity payments required a commitment of 10yrs to conservation management, which was subsequently reduced to 5yrs in 2007 (Kosoy et al 2008).
[738] PSA-CABSA was a lobbied for programme (by community and forest-based organisations e.g. Mexican Council for Sustainable Agro-forestry and the National Union of Community Forestry Organisations) and the NRA which was ratified in November 2003 introduced a development plan for rural Mexico that would allow a policy of payments for ecosystem services (on a broader scale than PSAH) to be implemented (Kosoy et al 2008, Corbera et al 2009).
[739] Since 2004
[740] This figure includes land designated in the project design phase and project implementation phase during the period 2004 – 2007 (Corbera et al 2009).
[741] Since 2003
[742] In 2009, this refers to the total area of Coatepec under PES, which includes PSAH, actual area under payments for FIDECOAGUA is around 700ha (According to the Fidecoagua blog).
[743] Pasture
[744] Silvopastoral management
[745] Project active from 2002 to 2008
[746] Pasture for cattle or crop cultivation e.g. rice, beans etc.
[747] In addition to hydrological services wood and climate regulation are important extra benefits of forest cover.
[748] Among the land uses promoted by the scheme include: prevention and control of fires, restricted timber extraction and reduction in subsistence crop farming
[749] Programme was established in 2003.
[750] Crop and livestock
[751] Forest and páramo

						Decree No. 2224, 1999 Environmental Management Law, National Forest Law[752]			
Ecuador PROFAFOR	2, 6, 11[755]	2	3[756]	Area[757] Management[758]	2	No PES Law	0/1[760]	4[761]	22287 (in 2005)[762]
Ecuador Socio Bosque	1, 2, 4, 8, 9	1, 2, 3, 5	2, 4	Live-stock [759] Conservation Contract[763] Investment Plan[764]	1	No PES Law National development plan[765]	0	3[766]	527503 (Oct 2010)[767]
Bolivia	2, 3, 4, 5, 8[768] 9	1, 3[769]	2, 4[770]	No minimum farm size	1	No PES Law	0	4[771]	2774 (in 2007)
Los Negros (Local NGO /municipal govt programme) Bolivia	1, 2, 3[772] 4	2[773]	1[774], 2, 4[775], 5[776]	No minimum land to be enrolled Not indicated	3	No PES Law	0	4[777]	634000

[753] Programme established in 2000.
[754] The initial target laid down in 2000 was 638ha.
[752] Water laws and regulations provide the contextual background and operating space in which PES instruments could develop.
[755] Coastal lowlands
[756] Re-and Afforestation
[757] Since 2000 minimum contract area is 50ha
[758] Active plantation management, fire control and surveillance is required.
[759] Livestock is required to be removed.
[760] The signing of new contracts stopped in 2002.
[761] The programme began in 1993.
[762] The initial target in 1993 was for 75000ha
[763] The Conservation agreement stipulates prohibited activities and those still allowed to continue: Prohibited land-use activities include: no conversion of conservation areas to other uses, no form of burning and no logging. Sanctioned actions include some non-timber product extraction and some subsistence hunting.
[764] According to the authors the purpose of the investment plans is not to be prescriptive but to provide guidance regarding the optimal means for utilising the monetary incentive for conservation and community development purposes.
[765] Otherwise known as Plan Nacional para d Buen Vivir the document rpvides a range of environmental and social goals to be achieved, in particular: to reduce deforestation, 30% by 2013, reduce Ecuador ecological footprint and reduce rural and urban poverty by 20-60% respectively by 2013.
[766] The first agreements were signed in November 2008.
[767] The goal is to enrol 3.6 million ha.
[768] Puna: native Andean alpine grassland
[769] Cloud forest migratory avifauna species.
[770] Prohibited practices include no tree cutting, hunting or forest clearing.
[771] Project initiated in 2003, pilot phase lasted three years.
[772] Slash and burn cultivation
[773] Carbon storage and sequestration

Noel Kempff Mercado Climate Action Project **Brazil** **Bolsa Floresta (Local-Municipal scale)**	1, 3, 4, 9	2, 4[778]	2, 4	Families must commit to specific obligations.[779]	1	There is no PES law but contextual laws that enable market mechanisms to operate n Amazonas State.[780]	0	3[781]	10x10[6] (Sept 2009)[782]
Columbia	1, 3[783]4, 9	2, 3	1	Location Herd size	1	No PES Law	1	3[784]	2893
Honduras	1, 2, 3, 4	1 [785]	1, 2, 3, 4[786]	First come fist served Not indicated[787]	1	No PES Law	1	3[788]	74[789]
Jesus de Otoro PES programme (PASOLAC) **Madagascar** **Durrell**	1, 3, 4	2, 3	FP	State of biodiversity in forest areas	1	No PES Law[790]	0	4[791]	unclear

[774] Reduction in slash and burn agriculture practiced by indigenous communities within the Noel Kempff Park.
[775] Deforestation avoidance project through the purchasing of logging concessions.
[776] Monitoring of logging companies
[777] NKMCAP was initiated in 1997.
[778] Functioning to improve the livelihoods of traditional and indigenous people
[779] Families are required to attend a two day environmental awareness training programme. They must commit to undertake zero deforestation, through the non-expansion of crops and pasture, and lastly they must enrol their children into school.
[780] Climate change, environmental conservation and environmental awareness law (passed in 2007) and Law 53, which established the States' system of conservation units.
[781] The programme commenced in 2007.
[782] This figure covers 14 State conservation areas. The aspiration of the programme is to cover 17 million ha across 34 State reserves (8 fully protected and 26 with small partial resource extraction activities – both timber and non-timber).
[783] Pasture for cattle and land for crops.
[784] Project ran from 2002 to 2008
[785] In addition to hydrological services which is the main benefit, wood and climate regulation are also listed as secondary benefits.
[786] Land uses promoted to meet these alternative practices include: planting live fences and designing terraces, no burning and establishing agroforestry system
[787] Although payment depends upon the number of practices each landholder adopts and on the type of forest protected.
[788] The programme was initially set-up on 2001.
[789] The programme aspires to 200ha coverage.
[790] Although there is no specific environmental legislation enacted that specifically sanctions PES implementation the Durrell Conservation Trust has worked in the region since 2000, the consequence of which has been to lay the ground work for enabling the introduction, development and operationalisation of an incentive-based initiative for forest-use.
[791] Programme was first developed in 2003.

Conservation Trust PES scheme (local programme) Mozambique	1, 3[792]4, 9	2, 3	3[793]	Not indicated	2	No PES Law	0	4[794]	35000[795]
Carbon Livelihoods Project Kenya	1, 2, 3, 4, 9	1[796]2, 4, 7[797]	1, 3	Project Action Plan for each water-shed	1	No PES Law	1	3[798]	Project occurs across 15 micro-water-sheds
Western Kenya Integrated Ecosystem Management Project (WKIEMP)									1820[799]
Cambodia*	1, 3, 4[801], 8[802]	3, 7[803]	5[804]	Land-use plan	1	No PES Law	0	4[805]	2220[800] n/a
Community-based Ecotourism Cambodia*	1, 3[806]	3, 4	See footnote 138	Land-use plan	1	No PES Law	0	3[807]	?
Agri-payments for wildlife friendly products Cambodia*	1, 3, 8	3	2	n/a	n/a	No PES Law	0	4[808]	n/a
Bird nest protection programme China	2, 3, 8, 9, 11[809]	1, 2, 3, 6[810]	1, 3[811]	The majority of	2	No PES Law	0	4[812]	20.7 million

[792] Depending upon the village agriculture is mainly subsistence or subsistence substituted with commercial growing e.g. tobacco.
[793] Predominantly new tree planting for carbon sequestration and storage – fruit trees and or indigenous timber – within an agro-forestry framework.
[794] Programme was begun in 2002.
[795]Refers to the area managed and rehabilitated (EnvrioTrade 2012, http://www.envirotrade.co.uk/html/projects_gorongosa.php)
[796] In terms of international waterways
[797] Soil erosion and fertility
[798] Project began in 2005 and closed in 2010
[799] This figure refers to the area reforested for carbon sequestration
[800] This figure refers to the area of land brought under sustainable land management
[801] Deciduous dipterocarp forest
[802] Flooded grassland and wetlands
[803] Tourism/leisure
[804] No hunting
[805] Programme began in 2004
[806] Rice cultivation
[807] Programme started in 2007
[808] Programme initiated in 2002 with four pilot sites in Kulen Promteo Wildlife Sanctuary and in 2004 it was extended to Preah Vihear Protected Forest. By 2007 the scheme was operating in 15 villages.
[809] Arid regions
[810] Drought, flooding and desertification reduction

				house-hold land MUST be retired or afforest-ed under the SLCP					afforest-ed and enrolled.[813]
Sloping Land Conversion Programme (National Programme) China **National Forest Conservation Programme (National Programme)**	1, 2, 3, 8, 9	1, 2, 4, 6	2, 3, 4	Not indicated	1	No PES Law	0	4[814]	~10 million by 2005 across 18 provinces[815]

[811] Timber plantations are also of particular importance to the SLCP process.
[812] The SLCP was initiated in 1999. The pilot phase ran from 1999-2001 in Shaanxi and Gansu Provinces (Yellow river basin) and Sichuan Province (Upper Yangtze Basin) with full implementation occurring in 2002.
[813] By 2006 11.7 million Ha was afforested and 9 million Ha of cropland enrolled in the programme across 25 provinces and 2000 counties. The goal of the SLCP is to increase vegetative cover by 32 million Ha, to be achieved through 18 million ha of barren land being afforested and converting 14.7 million Ha of sloping cropland to grassland and forest.
[814] Programme initiated in 1997/1998.
[815] Programme aims to afforest 31 million ha by 2010 through montane closure and reduce timber extraction from 32 million m^3 in 1997 to 12 million m^3 in 2003.

Table 14 Programme Design and Institutional Arrangements – Fully Annotated

Programme	Buyer	Seller	Intermediaries	Project Initiator	Seller Selection	Conditionality	Monitoring	Sanctions	Contract Length
Costa Rica PSA	4[816]	1, 3[817], 4	1[818], 4[819]	4	2, 4, 5, 6	3	1, 4, 5	1, 3	5[820], 7
Mexico PSAH	2[821], 5[822]	1, 2, 4	4[823]	4	4, 5, 6, 7[824]	3	1, 5	1,2	3, 6[825]
Mexico PSA-CABSA	5	1, 2, 4	4[826]	2	4,6	1	1, 5	2	3
Mexico Fidecoagua	4	1	3[827], 4[828]	5	6	?	1, 5	?	7[829]
Nicaragua RISEMP	3[830]	1	1[831]	3	2	3[832]	1	5[833]	3[834]
Nicaragua PPSA-H	1[835]	1	1, 2, 3[836]	1, 3[837]	2	?	1	6	?
Nicaragua	4[838]	1	1[839]	2[840]	7	?	?	?	?

[816] FONAFIFO (semi-autonomous agency). Board members are from the Ministry of Environment, Ministry of Agriculture, the National Banking System and private forest sector (Pagiola 2008).
[817] Hydropower companies, breweries, construction, tourism and agriculture-related (Blackman & Woodward, 2010).
[818] FUNDECOR
[819] SINAC (Sistema Nacional de Areas de Conservacion) until 2003 after which FONAFIFO took over.
[820] 5yrs to 10yrs depending upon PES modality. Forest conservation contracts are 5yrs whereas for timber plantations it's 10-15yrs.
[821] Monarch Butterfly Conservation Fund and the Scolel Té Project
[822] CONAFOR
[823] CONAFOR (semi-autonomous agency) which is the National Forestry Commission –whose function is to allocate, handle and disburse programme funds, liaise between policy/government and service providers and essential be the body primarily responsible for administrating the PSAH programme.
[824] Near urban centres and areas of water scarcity (exploited aquifers)
[825] 5yr contracts
[826] CONAFOR
[827] FIDECOAGUA
[828] CONAFOR acts as a facilitator
[829] Contracts are renewable every year.
[830] International facility – GEF, implemented by the World Bank
[831] Nitlplan, affliated with the Central American University
[832] Payments are conditional on a net increase in ESI points, and are proportional to the level of service provided.
[833] Payments are performance based, service delivery determines payment amount, so if the service reduces so does the payment level. Thus potential future loss of payments through not earning enough ESI points is the sanction.
[834] Contract length is four years.
[835] CASUR – local sugar company
[836] Management committee includes members of GTZ, local municipality and service providers and users.
[837] GTZ/DED (German development agencies) > now renamed GIZ

PASOLAC									
Ecuador Pimampiro	1[841] 4, 6[842]	1, 2[843]	1[844], 3	2[845]	1[846]	2[847]	2[848], 4[849]	1, 2[850]	3[851]
Ecuador PROFAFOR	1[852]	1, 2	5[853]	1	2[854], 3[855]	3	2[856], 4[857]	2[858], 3[859]	5[860]
Ecuador SocioBosque	5	1, 2, 4	4[861]	1/4	2[862], 6[863], 7[864]	3	1, 5, 6[865]	1, 2, 4[866]	4[867], 7
Bolivia	4[868]6[869]	1	1[870]	2[871]	6, 7	3[872]	1[873]	1 /2[874]	6[875], 7

[838] Local Water Committee charge 125 households US$ 0.31/month extra water fee.
[839] PASOLAC
[840] PASOLAC
[841] Industry and commercial firms, pay an industrial tariff of US$2.16 per 17 cubic metres of potable water.
[842] 1350 households, pay a residential tariff of US$0.96 per 17 cubic metres of potable water.
[843] Nueva América Association established in 1985.
[844] DFC→CEDERENA/UMAT. Desarrollo Forestal Communitario (DFC) was established as part of an FAO project. It has been working in Ecuadorian highlands since 1993, providing technical assistance, training and community empowerment to farmers and indigenous connunities. In 1994 the DF worked with Nueva American Association to develop a forest management strategy. In 1997 several individuals from the DFC established CDERENA (the Ecological Corporation for the Development of Renewable Natural Resources as a national NGO as an institution to enable community management of resources, development and environmental services. In 1998 the Environment and Tourism Unit (UMAT) within the governance structure of the town was created.
[845] CEDERENA
[846] Focused on the Nueva América Association.
[847] Conditionality has been limited by personnel security. Theoretical conditionality should be relatively strong as an agreement is made and signed with Pimampiro municipality that outlines the areas covered, determines payment with respect to present land use and establishes a land management plan for the property.
[848] Quarterly
[849] Municipal Environment Unit.
[850] Payments maybe suspended for up to two quarters, if the conservation agreement is violated again then payments maybe suspended entirely.
[851] Originally this was the contract length, and then in 2005 contracts were extended in perpetuity.
[852] International Dutch Electricity Generating Board via Forest Absorbing Carbon Dioxide Emissions Consortium (FACE).
[853] PROFAFOR service-buyer designed Ecuadorian company.
[854] Slope, soil and altitude
[855] For example local timber markets
[856] 1 to 4 times annually
[857] PROFAFOR
[858] Some contracts have been cancelled.
[859] 20% of payments are held back until year three, and payments are made contingent on plantation condition (~ 75% survival).
[860] Initially 15 to 20yrs, in 2000 PROFAFOR increased contract length to 99yrs
[861] Ministry of Environment
[862] Threat of deforestation
[863] Focus on native forests and parámo
[864] In two senses: the importance of ecosystem services and with respect to poverty levels
[865] The use of satellite and aerial photography
[866] In the case of early retirement from the scheme
[867] Contracts are for 20yrs
[868] Downstream irrigators via the local municipality of Pampgrande > paying to conserve forest/puna landscape for the maintenance of dry season water supply.
[869] US Fish & Wildlife Service > paying for the projection of migratory bird species habitat.
[870] Fundación Natura Bolivia
[871] Fundación Natura Bolivia
[872] However, compliance is not based on the delivery of the paid environmental services per se but on the use of the stipulated land management actions.
[873] Monitoring is conducted by a specially created Project Control Team, which visit the parcels of land enrolled under the scheme. Following, they submit a report of their monitoring findings to the Enforcement Directorate.
[874] Exclusion for up to five years is within the remit of the Enforcement Directorate to deliver.

Los Negros									
Bolivia Noel Kempff Mercado Climate Action Project	1[876]	3[877]	5[878]	2[879]	7[880]	1[881]	3[882]	6	?
Brazil Bolsa Floresta	4[883], 7[884]	1, 2, 4	1[885]	1	6, 7	2	1, 2[886], 4	3[887]	7[888]
Columbia	3[889]	1	1[890]	3[891]	2	3[892]	1	5[893]	3[894]
Honduras Jesus de Otoro (PASOLAC)	4[895]	1	1[896]	3[897]	7	1/2[898]	?	?	?
Madagascar	3[899]	2	2[900]	3[901]	2, 6	3[902]	1, 4[903]	4[904]	1, 2[905]

[875] Contract lengths can vary from a minimum of 1 year to a maximum of 10 years. Sellers decide on the length of contract to which they wish to agree to. Contracts are not linked to long-term conservation agreements – according to Asquith et al (2008) this was a political decision taken to allay fears that there was a government-backed policy to permanently introduction land prohibitions.
[876] Noel Kempff: a partnership between the Bolivian Government, The Nature Conservancy and a national NGO Fundacion Amigos de la Naturaleza.
[877] Logging concessionaires
[878] APOCOM (Apoyo Communitario) – a 10yr subsidiary programme of Noel Kempff that operates with the indigenous communities to provide human and physical capital.
[879] Fundacion Amigos de la Naturaleza
[880] Logging concession areas
[881] With respect to the indigenous communities the suggestion is that there is little in the way of conditionality with few restrictions in place to prevent pejorative forest uses.
[882] In relation to the carbon sequestration and storage project component, in 2005 Noel Kempff became the first emission reduction project that was externally verified by a third party compliant with international standards.
[883] Government of Amazonas State.
[884] Bradesco Bank, and latterly 'other' (not specified) private partners.
[885] Fundacao Amazonas Sustentavel (FAS) – responsible for community relations, liaison and communication – not responsible for the distribution of funds.
[886] In-loco inspections and monitoring via satellite imagery
[887] Severe infarctions would to cessation of financial benefits. The Bolsa Floresta scheme works on a card penalty scheme – with red and yellow indicating differences in severity. There remain doubts about how well these sanctions are enforced.
[888] Annually
[889] GEF
[890] CIPAV (Centre for Research on Sustainable Agricultural Production Systems)
[891] GEF, supported by the World Bank, LEAD (Livestock, Environment and Development Initiative) and FAO.
[892] Payments are conditional on a net increase in ESI points, and are proportional to the level of service provided
[893] Payments are performance based, service delivery determines payment amount, so if the service reduces so does the payment level. Thus potential future loss of payments through not earning enough ESI points is the sanction
[894] Contract length is four years.
[895] JAPOE (local Council for Administration of Water and Sewage Disposal). JAPOE charges water fees to 1269 households, water tax, of an additional US$0.06/household/month
[896] PASOLAC (Programme for Sustainable Agriculture in Hillsides of Central America)
[897] Swiss International Cooperation
[898] Payment amount depends upon the number of practices adopted and the type of forest protected.
[899] Durrell Conservation Trust
[900] Community forest association has responsibilities for local enforcement of management rules, the granting of access permits to multi-use forests and the distribution of awards
[901] Durrell Conservation Trust
[902] Payments are contingent of the state of strictly protected areas (biodiversity) and on factors that affect the system (governance).
[903] Monitoring is undertaken by Durrell and local community members.
[904] There are a number of activities which are prohibited in the strictly protected forests which if individuals are found perpetrating may lead to fines (local and national ones) and, potential, prison. However, in a number of cases enforcement of illegal activities is low.

Durrell Conservation Trust PES scheme									
Mozambique Carbon Livelihoods Project	6[906]	1	5[907]	5[908]	1	2	6[909]	5[910]	4[911]
Kenya Western Kenya Integrated Ecosystem Management Project (WKIEMP)	5	2	4[912]	1 →4	2, 6, 7	1 /2[913]	3	6	8[914]
Cambodia Community-based Ecotourism	1[915], 4[916]	5[917]	1[918], 5[919]	3[920], 4[921]	1, 6	3[922]	3[923]	3[924]	?
Cambodia	6[925]	1	4, 5[926]	1[927], 3[928]	1	3[929]	4[930]	3(?)	?

[905] Interventions range from 2yrs to 5yrs.
[906] As a verifiable emission reduction scheme generating credits, the international voluntary carbon market is the ultimate 'buyer'.
[907] The Carbon Livelihoods project is overseen by an international consortium of partners that act to establish voluntary contracts with individual landholders, under a Plan Vivo system, to plant trees for carbon sequestration and storage that will then function as a credit system on the international market. The consortium is an intermediary between the international market and the landholders and provides a trust fund from which a portion of the sale deeds is directed which is then subsequently disbursed to landholders as a cash payment and the community for development activities.
[908] EnvioTrade (Private firm), University of Edinburgh, Edinburgh Centre for Carbon Management (Consultancy)
[909] Monitoring is undertaken by technical staff e.g. seed survival prior to release of payment, as well as monitoring of specific practices e.g. new clearing but the level of inspections i.e. monitoring frequency is not detailed.
[910] With held payments, if plant seedlings do not survive as identified through the monitoring process presumably initial payment is not made (my inference from article description)
[911] Contracts are made on the basis of conditional payments to plant trees and manage the area in the same way for 25 years. Payments are made asymmetrically over the course of seven years: 30% yr1, 12% for years 2 to 6 and then 10% in year 7.
[912] Kenya Agricultural Research Institute – semi-autonomous government agency
[913] Several low to moderate examples were identified of instances in which funds and management activities could be mis-directed, breached or not adhered to.
[914] The length of the project: 5yrs.
[915] Private sector taking tourist bookings that provide revenue
[916] Protected Area Authorities approve tourism agreements, as well as as local statutes and law enforcement
[917] Elected village committee manage income received and fund disbursement and local enforcement of land-use plan and no hunting agreements – interacts with PA authorities.
[918] Sam Veasna Centre – civil society partner which has activities with respect to marketing, tourism booking management and monitoring.
[919] WCS functions as a general support and monitoring agent.
[920] WCS
[921] PA authorities
[922] Tourism revenue to villagers relies upon abiding by the land-use plan and the no hunting agreement. In addition visitors pay $30 for all species seen and $15 for a subset of species.
[923] WCS/PA are involved in monitoring agreements – not specifically monitoring ecosystem service (in the broadest sense) outcomes.
[924] Payment is based on agreements being honoured – specific sanctions are not mentioned – but payments are conditional on the observance of agreements.
[925] The village committee are the agents through which landholder rice is sold to a marketing association and they offer a preferential price to farmers by selling direct to national markets.
[926] WCS acts as an independent verifier. Market association, monitors agreements and trade prices.
[927] Village committee

Agri-payments for wildlife friendly products									
Cambodia Birds Nest Programme	3[931]	6[932]	n/a	3[933]	1[934], 6	3	2[935]	3[936]	6[937]
China Sloping Land Conversion Programme	5[938]	1	3[939]	1→4	1, 5, 6[940]	3	2, 4, 5[941]	3	1[942], 4[943]
China National Forest Conservation Programme	5	1	3	1→4	2, 5	4	?	?	?

[928] WCS
[929] Less than 8% of families were identified as having broken land-use plan rules
[930] In addition to monitoring by the village committee, there is external verification by the Market Association
[931] WCS – individual contracts are made with WCS.
[932] Local people, not specifically local landholders, can participate in the scheme
[933] WCS
[934] Individual focus
[935] Protection teams are visited every two weeks by village rangers
[936] Full payment is received if it can be demonstrated that nests failed due to natural consequences e.g. predation. In other words the second half of payment is made when the birds have successfully fledged.
[937] Nesting season dependent
[938] State Forestry Administration is dominant in the design, operation and implementation aspects of the SLCP.
[939] Both village and township level administrations/governments.
[940] Highly influenced by local government structures and preferences as only those within participating villages are allowed to participate.
[941] Village, township, municipal and central government level.
[942] Grasslands (2yrs).
[943] Ecological forests (8yrs) and economic forests (5yrs). According to Zheng et al (2008), after the SFA, ecological forests are defined as timber producing forests; whereas, economic forests are defined as orchards or forests with medicinal values.

Table 15. Programme Financial and Funding Arrangements – Fully Annotated

Programme	Payment Mode	Payment Amount (US$/ha/yr)	Payment Heterogeneity	Payment Frequency	External Donor Support	Programme Cost (US$)	Total Level of Investment (US$)
Costa Rica PSA	2	45-163[944]	1	3	1 (World Bank, GEF[945], GTZ, KfW[946], CI[947])	3[948]	206million (17.2million/yr)[949] 175million (15.9million/yr)[950]
Mexico PSAH	2	18.2& 27.8[951]→ 27.3 & 36.4[952]	1, 2[953]	2	1[954]	1[955], 2[956]	97.9 million[957]
Mexico PSA-CABSA	2	$4x10^5$ to $5x10^5$ plus extra funds[958]	1[959]	3	1[960]	1	165.62 million[961] From 2007 (60 million[962], 80 million[963] and 25 million[964])

[944] F-M (US$64-70/ha/yr from 1997 to 2002), F-P (US$46/ha/yr in 1997; in 2009 depending on the ES and area payments are US$64, 75, 80/ha/yr), R (US$55/ha/yr in 1997, from 2004-2005 US$60-82/ha/yr and 2008-2009 US$82-98/ha/yr), NFR (US$41-64/ha/yr depending on Carbon accounting), Agro-forestry (US$1.30/tree over 3yrs), Private sector Hydropower companies (US$15/ha/yr to US$67/ha/yr). (Sources: Miranda et al 2003; Pagiola, 2008' Wunder et al 2008; Daniels et al 2010; legrand et al 2010).

[945] Ecomarkets funded by GEF (US$8million) and the World Bank (US$16million). MMBIEM Project received US$10million from GEF.

[946] German aid agency supplied the Huetar Norte Forest programme have with US$11.9million of funds in 2003.

[947] Conservation International (~ US$0.5million funding)

[948] A 7% levy (originally 5%), fixed by law, placed on the flow of funds handled by FONAFIFO finances the programmes own costs. Some transactions are borne by participants (anywhere from 12% to 25%). FONAFIFO costs increased dramatically since 2008 to 22% of the budget (Legrand et al 2010).

[949] According to Porras (2010) this is the amount the programme disbursed during 1997-2008.

[950] According to Legrand et al (2010) this is the amount channelled through the programme during 1997-2008.

[951] Original prices proposed in 2002/2003 with higher prices per hectare for cloud forest (US$27.8) compared to other forest types (US$18.2).

[952] However, the original prices were subsequently increased in 2004 to US$27.3 for non-cloud forest and US36.4 for cloud forest. Cloud forest thought to have higher impacts on the production and maintenance of hydrological services.

[953] Increase of ~ US$10/ha/yr for cloud forest protection.

[954] World Bank, GEF

[955] Annual cost of monitoring in the first year of the programme was US$714285 which was borne by CONAFOR

[956] Water-user fee – federal water fee set annually by congress – originally it was an earmarked 2.5% cut of the funds.

[957] These are funds obtained between 2003 and 2006: 18.2 million (2003), 27.3 million (2004), 26.2 million (2005) and 26.2 million (2006)

[958] Values shown here are in Mexican $ and do not refer to $/ha/yr. Payments are set annually by congress. Initially applicants would receive Mx$400000 for project design and implementation. For carbon projects prices were guaranteed between a minimum of Mx$50 to a maximum of Mx$98 per tonne of carbon sequestered. For biodiversity projects applicants would receive Mx$500000 for implementation over a 5yr period. Extra funding could be applied for on top of this: Mx$150000 to pay for programme verification, Mx$1500000 for local capacity building activities and up to Mx$250000 for technical assistance and project follow-up (Kosoy et al 2008; Corbera et al 2009). Since 2007 payment amounts have changed substantially and are set according to Mexican minimum daily wage.

[959] Payments differ according to project size.

[960] GEF loan and World Bank Grant

[961] This figure refers to Mexican$ over the period 2004 to 2006.

[962] This refers to a EGF loan of US$15 million and a World Bank Grant of US$45 million.

[963] CONAFOR is supplying US$ 80 million over two years

[964] This figure refers to Mexican$ and will be supplied by Congress.

Mexico Fidecoagua	2	78[965] & 68[966]	1, 2	3[967]	0	3[968]	90000[969], 45000[970], 27000[971], 162000[972]
Nicaragua RISEMP	2	Up to 75	2[973]	3	1[974]	3	4.5million
Nicaragua PPSA-H	2	35	0	3	1[975]	4	3790[976]
Nicaragua PASOLAC	2	18.7 – 33.1	2[977]	?	0	1	10000[978]
Ecuador Pimampiro	2	6 - 12[979]	1[980]	3	1[981]	1[982]	82444[983]
Ecuador PROFAFOR	1, 2[984], 3	60 – 635 per household[985]	1[986]	3	0	1	6.54 million[987]
Ecuador SocioBosque	2, 3	30[988], 20[989], 10[990], 5[991], 2[992],	3[994]	3	0	1[995]	8.5 million[996]

[965] Cloud forest
[966] Pine Oak
[967] Monitoring by CONAFOR
[968] Municipal water tax and national government
[969] Initial seed fund: Federal funds MxS400000, CONAFOR (through the PRODEFOR programme) Mx$500000 and municipal water utility Mx$100000 (Watershedmarkets.org)
[970] Amount supplied for payments in 2003
[971] Amount supplied for payments in 2004
[972] Funds allocated for payments in 2009 (Fidecoagua blog)
[973] The project specifies up 28 different land-uses, each with a specified number of biodiversity and carbon sequestration index points, so depending on the type of land-uses changes made the ESI point scores will differ quite substantially as therefore will payments.
[974] GEF
[975] As above
[976] This refers to the amount of payments made so far, it does not represent the complete project costings.
[977] Forest conservation (51US$/ha/yr), reforestation (US$124 (yr 1), US$100 (yr 2), US$67 (yr 3)/ha/yr
[978] This figure represents the initial start-up costs.
[979] Payment amounts are the consequence of political negotiation rather than a result of technical analysis.
[980] Páramo with an absence of human activity ($1/month/ha), Páramo with some human activity ($0.5/month/ha), Primary forest ($1/month/ha), Primary forest with some human activity ($0.5/month/ha), Mature secondary forest ($0.75/month/ha), Young secondary forest ($0.5/month/ha), agriculture and livestock ($0/month/ha) and degraded land ($0/month/ha) Echavarria et al (2004).
[981] FAO – Rural Forestry Programme/Forest Action Plan for Ecuador and the Inter American Foundation.
[982] External donors, water users and municipality.
[983] This amount reflects the input between 2000 and 2005. Net revenue for this period is US$19457.
[984] 70-100% value of harvested wood, 100% value of non-wood products
[985] Total = cash, in-kind and technical assistance for year 1 to 3.
[986] As a result of the differences in carbon sequestration rates with altitude lowland per hectare payments i.e. on the coast are larger than those received in the highlands.
[987] This represents to the total project cost between 1993 and 2005.
[988] Refers to payment level for the first 50ha enrolled
[989] Refers to the payment level for every hectare enrolled after 50ha between 51-100ha
[990] Refers to the payment level for every hectare enrolled after 100ha between 101-500ha
[991] Refers to the payment level for every hectare enrolled after 500ha between 501-5000ha
[992] Refers to the payment level for every hectare enrolled after 5000ha between 5001-10000ha

Bolivia Los Negros	1[997], 3[998]	0.5[993] 3[999]	2[1000]	3	1[1001]	1[1002]	50000 (external funds)
Bolivia Noel Kempff Mercado Climate Action Project	2, 3[1003]	1.6 mill-ion[1004] 0.85 mill-ion[1005]		4[1006]	1[1007]	1	4500 (municipal funds) External donors contributed ~ 11 million[1008]
Brazil Bolsa Floresta	2, 3	29[1009], 2320[1010], 4640[1011]	0	1,3	1[1012]	1	23.2 million[1013]
Columbia	2	75[1014]	2	3	1[1015]	3	4.5million
Honduras	2	9.5 to 15.9	2[1016]	?	1[1017]	1[1018]	30000[1019]
Jesus de Otoro (PASOLAC)							
Madagascar	1, 2[1020]	136 - 2230[1021]	3[1022]	3	1[1023]	3[1024]	8500[1025]

[994] Payment varies according to the land area enrolled
[995] Public funds
[996] This refers to the amount invested during the first two years of programme funding
[993] Refers to the payment level for every hectare enrolled after 10000ha from 10001ha onwards
[997] In-kind payments were made at the request of sellers. In-kind payments are represented by a single beehive unit given for every 10ha of forest protected per year. This is equivalent to a cash payment of US$3/ha/yr. Those with smaller farms are able to increase their contract length so that the equivalent payment is made. Other farmers have called for a broader array of in-kind compensation 'gifts' which now include a roll of barbed wire or fruit seedlings.
[998] Technical assistance includes: apical training, environmental education and skills workshops set up by Fundación.
[999] This represents the in-kind cash equivalent.
[1000] Cloud forest and grassland (without intervention) is US$3/ha, moist forest (without intervention) and old growth forest (subject to less than 6 months cattle grazing) is US$2.25/ha, and finally, old growth forest (with greater than 6 months cattle grazing) and secondary forest is US$1.5/ha.
[1001] US Fish and Wildlife Service (primary), some secondary funds received from UNDP, Blue Moon Fund and the Conservation, Food and Health Foundation.
[1002] External donors and municipal government.
[1003] Technical assistance provided to indigenous communities: aiding the acquisition of land title, access to micro-credit, national park employment and ecotourism opportunities.
[1004] This figure is not related to plot area. It represents the total net payments made to concessionaires in return for abandoning logging operations within protected area. Payments made immediately.
[1005] This figure is not related to plot area. It represents APOCOMs compensatory fund, provided over a 10yr period, for the purposes of providing technical assistance in the form of human and physical capital.
[1006] One-off payments made to concessionaires. Communities receive payment in technical assistance terms for which there is a dedicated budget of 0.85 million US$ spread over 10yrs.
[1007] American Electric Power, British Petroleum Amoco, PacifiCorp.
[1008] Unsure if this represents the total project costs, however, it does represent the majority investment by a significant margin.
[1009] This figure is not area related. The amount refers to the monthly amount (in dollars) given to forest dweller families – specifically distributed to women.
[1010] This figure is not area related. The amount refers to annual community funds for activities that do not involve deforestation.
[1011] This figure is not area related. The amount refers for annual funds given to community infrastructural development investments.
[1012] World Bank, GEF
[1013] Minimum investment fund, provided by Amazonas municipal government and Bradesco Bank.
[1014] This value is per incremental ESI point computed over the entire farm area (it is not US$/ha)
[1015] GEF
[1016] Primary forest (5.5US$/ha/yr), Secondary forest (4.1US$/ha/yr) and Young forest (2.8US$/ha/yr). Variation also according to the number of practices adopted, two practices (5.5 – 11US$ha/yr), three practices (8.3 – 13.8US$/ha/yr) and four practices (11 – 16.6US$ha/yr)
[1017] Swiss International Cooperation
[1018] Borne by the programme through water-user taxation
[1019] This figure represents the initial start-up costs.
[1020] Forest management associations receive payments but then distribute these payments to community members in terms of in-kind incentives e.g. cooking supplies, construction materials etc.
[1021] These values are not per hectare. They are monetary amounts awarded to communities and express the range of payments received by communities. Communities do not receive the same payments.
[1022] Payments in part are competitively determined thus there is community heterogeneity in payment awards.

Durrell Conservation Trust PES scheme Mozambique	2, 3[1026]	60[1027]	?	3	1[1028]	1[1029]	?
Carbon Livelihoods Project Kenya	3, 4	n/a	0	4[1030]	1[1031]	1	4.1 million
Western Kenya Integrated Ecosystem Management Project (WKIEMP)							
Cambodia Community-based Ecotourism	2	128 - 5846[1032]	1[1033]	1[1034]	1[1035]	1	50000[1036] 25000[1037]
Cambodia Agri-payments for wildlife friendly products	2[1038]	255 (160)[1039]	0	?	1[1040]	1	50000[1041] 10631[1042]
Cambodia	2	1 - 2[1043], 5[1044]	n/a	4[1045]	1[1046]	1	25000[1047]

[1023] Durrell Conservation Trust.
[1024] Each community has an annual membership fee from US$0.7 to US$7, in addition to a one time joining fee of US$0.5 to US$2.
[1025] This is distributed annually among 10 communities, total sum may therefore be approx US$72000 since first payments were made in 2003/2004.
[1026] The project assists in local development activities e.g. by providing funds for community enterprises
[1027] This figure is for per household per year
[1028] Original project funding was provided by the EU – cover transaction costs, livelihood support programmes, project set-up in the pilot phase (2002- 2008).
[1029] Since the end of the pilot phase in 2008 the programme has supported itself from carbon sales revenue.
[1030] Technical assistance and provisions were a continuous aspect of the programme.
[1031] World Bank, GEF, World Agroforestry Centre
[1032] This figure refers not to $/Ha/yr but $ amounts awarded to villagers (collectively) from 2003-4 ($128) to 2007-8 ($5846). The increase in 2007-8 is due to an additional $5000 contribution from UNDP. Average service payment per tourist is $10 (2003-4) rising to $68 (2007-8). It is not specifically stated in Clements et al (2010) but the assumption is the $ refers to US$.
[1033] Varies in the sense that visitors pay extra fees if they see all the species (bird species) that have been sought to be protected.
[1034] Revenues will be received during the tourist seasons. It's unclear whether additional revenues are achieved outside of the tourist season, and whether payments made to villagers occur during the tourist season months or are spread throughout the year. Furthermore, it is not clear how the monitoring functions in the respect of payment disbursement, but presumably it is ex post.
[1035] WCS supports the programme – not clear whether there is financial help, perhaps in the original start up costs, but in the main WCS offers technical advice and support.
[1036] Initial investment.
[1037] Cumulative revenues from tourism between 2003 and 2008. $14000 has been directed to pay for services provided by villages and $10000 has been used by the fund for various administration costs.
[1038] Farmers offered an average price of $0.25/kg of rice with profit sharing – 20% premium on the standard price.
[1039] These figures refer to the average and (median) family payment in year 1 in $. The payment is not area based i.e. the figure does not refer to $/ha/yr.
[1040] WCS
[1041] This figure represents the initial investment – it is not clear where the contributing sources to this investment originate – perhaps a combination of WCS, village committee, market association and local government – the market association does provide start-up capital and training.
[1042] This figure represents total village payments in year 1.
[1043] $1/day for their work plus S1/day worked upon completion if nests are successful = $2/day.
[1044] S5 represents a reward to local people for reporting nests/nesting sites – these people are then subsequently asked to participate in the monitoring programme. The amount acts as an initial incentive to participate.
[1045] Per day

Birds Nest Programme							
China Sloping Land Conversion Programme	1[1048]2, 4	36 (~300 yuan) 91[1049]	0[1050]	3	0	1[1051]	40 billion[1052]
China National Forest Conservation Programme	2	1050 yuan[1053] 750 yuan[1054] 3000/4500 yuan[1055] 10^4 yuan[1056]	1	3	0	1[1057]	61 billiion yuan[1058] 96.2 billion yuan[1059]

[1046] WCS
[1047] This figure represents the annual level of investment by WCS. WCS funds support the programme entirely, there are no other revenue streams.
[1048] Grain subsidy, which due to differing growing conditions and yield outputs is 1500kg/ha in Yellow river basin and 2250kg/ha in Yangtze river basin. Free seedlings are also provided to the farmer at the beginning of the project.
[1049] This amount refers to seedling provision for afforestation of cropland and barren wasteland.
[1050] Differences in compensation levels between Yangtze and Yellow river basins reflect inherent differences in regional yields.
[1051] Some central government funding, however, a significant proportion of funding is accessed from local management and township funds.
[1052] Total programme budget.
[1053] This is for forest regeneration via mountain closure.
[1054] For aerial seeding.
[1055] For artificial planting in the Yangtze and Yellow river basins respectively.
[1056] The price paid per worker for protecting 340ha forest patches.
[1057] Central government 81% and local government 19%
[1058] Spending between 1998 and 2005.
[1059] Projected allocated budget between 2000 and 2010.