

China's Eco Compensation Programme

Case study Module 2

Jin Leshan⁽¹⁾, Ina Porras⁽²⁾, Paris Kazis⁽³⁾ and Alvin Lopez⁽⁴⁾

Authors' affiliations:

(1) China Eco-compensation Policy Research Center (CEPRC) (2) International Institute for Environment and Development (IIED) (3) Independent consultant (4) Asian Development Bank (ADB)

Case study Module 2 in: [Guidance for Practitioners](#) Porras, I and Asquith, N (2018) Ecosystems, poverty alleviation and conditional transfers. International Institute for Environment and Development, London.



Ecosystems, poverty alleviation and conditional transfers

Guidance for practitioners

Edited by Ina Porras (IIED) and Nigel Asquith (Fundación Natura)

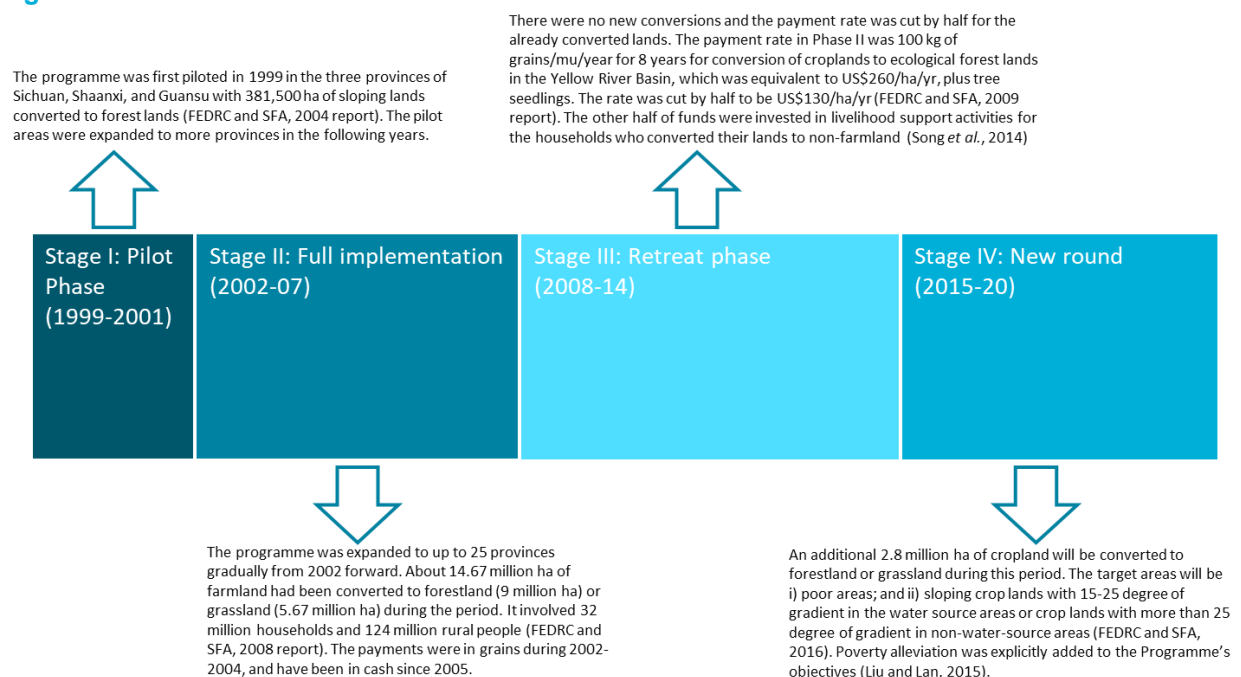


Evidence from the international research community shows that careful management of nature results in benefits to people's wellbeing. Poor people especially depend more heavily on the quality of the ecosystems and have less access to substitutes when they are degraded. Making meaningful impacts in the way ecosystems are managed requires governments to step in and scale up, but the evidence also shows that empowered communities can make strong calls to enact and implement change at the local level. Positive incentives like payments for ecosystem services (PES) and other forms of conditional transfers can provide important signals to enact this behavioural change into positive actions. Carefully designed, these incentives can also contribute to the wellbeing of people, especially poor and vulnerable groups. New tools emerge that can help with scaling up and dealing with inevitable trade-offs, but more efforts are needed to bring this information closer to those making decisions. This case study accompanies a [Guidance for Practitioners](#) that helps to bridge this space by: 1) making evidence accessible, bringing the latest evidence from research on PES in theory and practice with documented case studies written for practitioners; and 2) supporting capacity building to 'train the trainers', through teaching modules which can be used to promote capacity building of practitioners.

The People's Republic of China (PRC) has been experimenting for many years with eco-compensation programmes, as ways to redress missing market signals for ecosystem services (Zhang *et al.*, 2009). This paper provides a brief insight into one of its larger programmes: the **Sloping Land Conversion Programme (SLCP)**.

The SLCP, also known as 'Grain for Green' is the largest ecological restoration project in PRC and the biggest payment for ecosystem services (PES) initiative in the developing world, with a total current investment of more than US\$69 billion (Liu and Lan, 2015). It was launched together with the Natural Forest Protection Program (NFPP) as a response to the widespread flooding in the PRC in 1998 and has undergone four important developmental stages (see Figure 1). It is a key component of the Eco-Compensation Programme, which is a compendium of environmental policies and instruments, including environmental fiscal reform. The programme uses a series of conditional transfers alongside wider policies promoting off-farm income to encourage ecological restoration and contribute towards PRC's vision of 'ecocivilisation'.

Figure 1. The Four States of China's SLCP



Source: Forestry Economics and Development Research Centre (FEDRC) and State Forestry Administration (SFA); Liu and Lan, 2015; Song *et al.*, 2014)

Political support

Environmental shocks are sometimes triggers for environmental policy. The summer of 1998 saw large floods across China, with the loss of 4,150 lives in 29 provinces and damages estimated at 166 billion Chinese Yuan (CNY) or US\$25.5 billion (Huang, 2016). The Chinese government believed (or was convinced by the forestry community) that soil erosion from deforestation in the middle and upper reaches of Yangtze and Yellow river basins was the main human reason for the large floods and heavy damages. The central government policymakers quickly decided to carry out the SLCP to mitigate the soil erosion in 1999.

The initial objective of the programme was to reduce soil and water erosion by the targeting and conversion of 14.67 million ha of marginal farmland to forest or grassland. In 2007 'livelihood support' was added as an objective to the SLCP, to be achieved through livelihood diversification and increases in rural household incomes. In 2015, 'poverty alleviation' was explicitly added as one of the two objectives of the SLCP.

During recent years, the PRC has made substantial investments to restore ecological functions, and the country has issued more than 300 laws or regulations directly related to ecological compensation. Some provinces are especially engaged in the programme. For example, phase II of the programme in Qinghai province covered 395,000 km² and accounts for 55 per cent of the total province area, with a total estimated investment of 16.06 billion CNY by the end of 2020 (National Development and Reform Commission, NDRC, 2016).

A focus on ecological restoration and towards 'Green is Gold' now underpins China's eco-civilisation model (United Nations Environment Programme, UNEP, 2016). More than a concept, 'eco-civilisation' is an unprecedented transformation on a large scale of how people and the economy interact with nature. It includes recognising the major environmental costs of rapid development, such as an increased vulnerability to natural disasters and water and air pollution and addresses how to correct it. It tackles poverty and environment through direct and inclusive actions and through the Gross Ecosystem Product (see Table 1), it revolutionises performance indicators and the way China understands productivity.

Eco-compensation is one of eight mechanisms designed to bring 'eco-civilisation' into practice. Starting as a pilot in 1999 with the SLCP, it now encompasses environmental fiscal reform (revising taxes, subsidies, prices in line with beneficiary and polluter pays principles), financial transfers to change behaviour such as PES, and custom-made programmes to respond to the needs of key ecological functional areas.

The ethos of China's eco-civilisation can help shape the debate around environment, people and development in other countries. The Belt and Road Initiative (BRI) provides a unique opportunity to foster regional change, and leverage strategies to mainstream nature into economic development, in line with its ecological and environmental plan (Belt and Road Portal, 2017).

Sustainable finance

The programme is financed by the Ministry of Finance, from the national budget of the central government. The budget is guaranteed by the Regulation of the SLCP, which was issued in 2002 by the State Council of the PRC (State Council, 2002).

Between 2002 and 2012, total investment for the SLCP amounted to 438.5 billion CNY (about US\$69 billion), including the grain subsidy, seed fund, maintenance fees and various special funds, of which 326.2 billion CNY (approximately US\$52 billion) constituted direct payments, benefiting 32 million households in 25 provinces (Liu and Lan, 2015)¹. Some of the specific investments for forest ecological compensation are (NDRC, 2016):

- The central government has invested a total of 354.2 billion CNY in the reforestation project during 1990–2013, and a new round of reforestation policy implemented since 2014 has improved its subsidy standard.
- The phase I project of Beijing-Tianjin sandstorm source control invested 41.2 billion CNY within 10 years of starting in 2000, and the phase II project is planned to input 87.792 billion CNY during 2013-2022.
- A total of 126.16 billion CNY has been invested in Phase II Natural Protection Project (2011–2020) of Northeast, Inner Mongolia and other key state-owned forests.
- A total of 117.86 billion CNY has been invested in Phase II Natural Protection Project (2011–2020) of the upstream of the Yangtze river and midstream and upstream of the Yellow river.

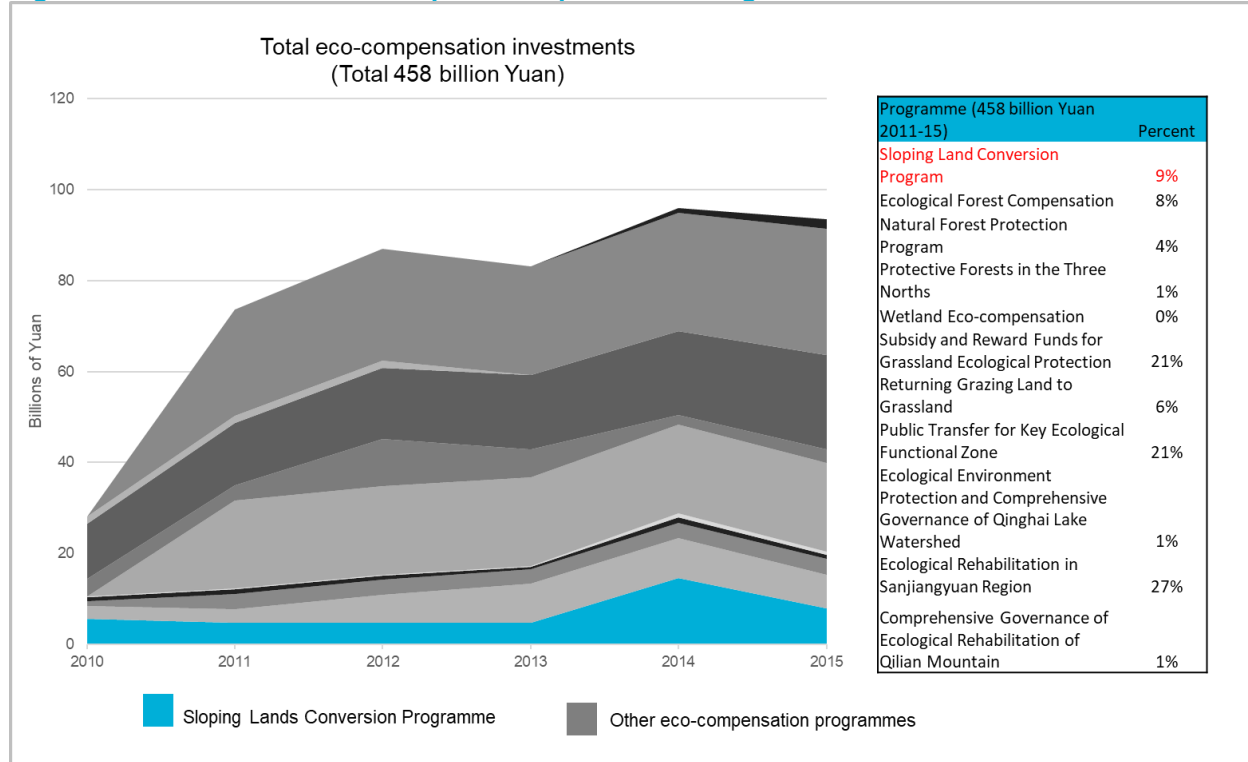
Other investments include direct allocations for grassland eco-compensations (21.6 billion CNY between 2003 and 2014), wetland eco-compensation (about 1 billion CNY), cultivated land ecological compensation (over 7 billion CNY in Hebei to reduce pollution and improve crop systems), as well as river basin eco-compensation, marine eco-compensation and wilderness eco-compensation.

Institutional set-up

¹ Amounts in USD are estimated using the 2012 average CNY exchange rate of 1 USD = 6.3125 CNY.

The SLCP is one programme within a larger portfolio of ecological investments led by the PRC government. This is important, as the different compensation programmes are designed to support and complement each other. Provinces with important natural endowments are making significant investments in nature, see Figure 2.

Figure 2. SLCP within the eco-compensation portfolio in Qinghai Province



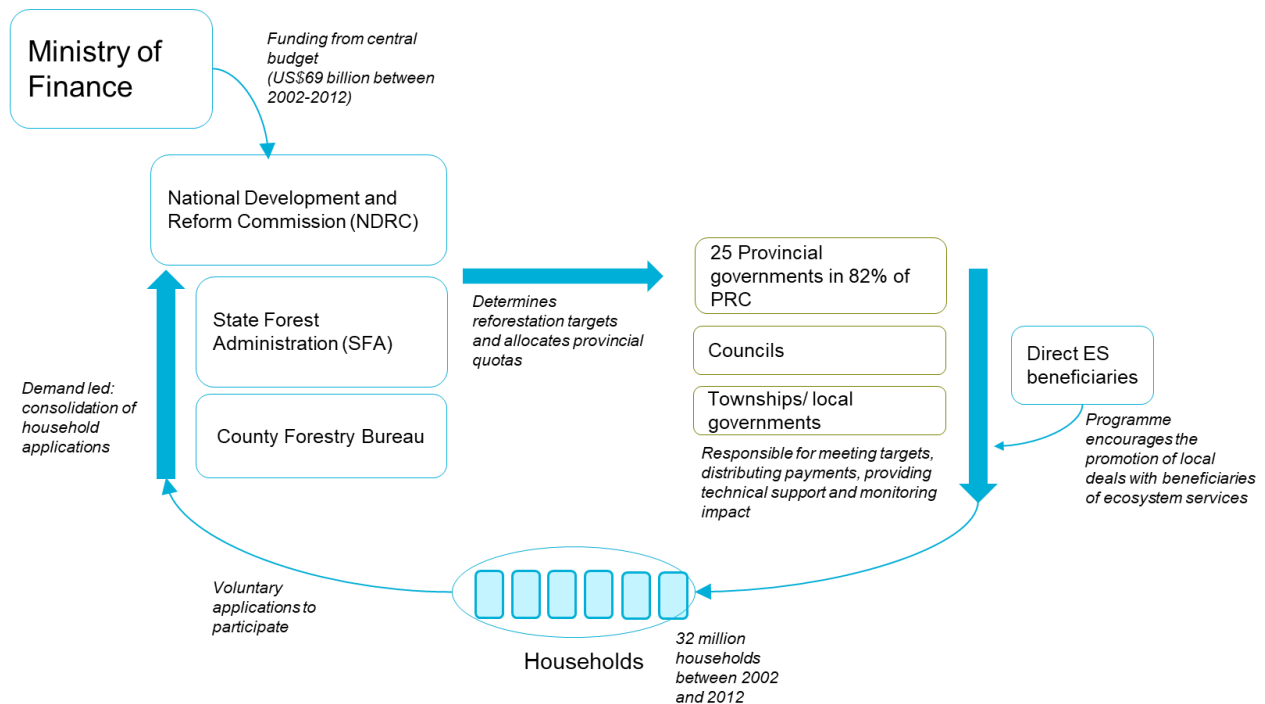
Source: authors' own, prepared with NDRC (2016)

The innovative character of the SLCP lies not only in its scale — targeting 25 provinces that cover about 82 per cent of PRC’s total land area — but also in its institutional design. Its hybrid form of governance combines a top-down approach with decentralisation at the provincial and local government levels, and voluntary participation at the household level. In practice, it works by compensating farmers for the provision and improvement of ecosystem services that they facilitate by retiring part of their land from cultivation and restoring it to either forest or grassland. In that way, it is an eco-compensation project that is distinctively different from the country’s traditional command-and-control instruments of environmental governance (Jin and Wenjuan, 2010).

The programme is planned by the NDRC based on bottom-up applications of households who want to join the programme, and it is implemented by the State Forestry Administration (SFA), with its finances managed by the Ministry of Finance.

After deciding on country and provincial level reforestation tasks, the SFA distributes the retirement quotas to provincial governments who then allocate them to the counties, townships and, finally, to the participating households. By signing liability agreements, the local governments are held responsible for meeting the targets set by the SFA. Accordingly, their responsibilities include allocating the quotas, targeting the enrolled areas, determining the participants, distributing payments, providing technical support and monitoring the programme’s achievements, see Figure 3.

Figure 3. Institutions: how does the SLCP in China work?



Systems and tools for effective implementation

Targeting strategies: In the planning stage, the areas targeted in Phase I, II and III of the SLCP are water source areas, riversides, lakesides and catchment of reservoirs. All these areas must be in the middle or upper reaches of the Yangtze river basin or Yellow river basin. The cropland plot to be converted must be of 25 degrees gradient or steeper. Poverty alleviation and ecological restoration were added as objectives in the latest Phase (IV, 2015-2020) of the SLCP. Marginal or poor areas is the necessary criteria for the local forestry administration to confirm household access to the SLCP and poor households are prioritised in joining the programme (FEDRC and SFA, 2016).

In selecting the croplands for conversion, two criteria might conflict with each other. One criterion is that the croplands to be converted should be as consolidated and connected as possible; and the other criterion is that the households should join the programme in a voluntary fashion. The programme manager at the local level might compromise voluntary participation to attain a consolidated piece of converted land that is as large as possible. In Phase IV this kind of manipulation is explicitly prohibited. Some researchers, (for example Barton *et al.*, 2012; Barton *et al.*, 2011), looking at PES in other countries suggests the use of agglomeration bonuses, to encourage blocks of landowners to apply together, while keeping their contracts voluntary. This is especially important for biological corridors or to achieve hydrological thresholds.

Suggestions for improvement include targeting the most disadvantaged communities and individuals, by basing quota allocation across the provinces not just on the geographical location of land, but also on socioeconomic indices such as regional differences in income. In addition, due to the structural changes in the economy effected by the programme, it is important to ensure the availability of alternative livelihood options to absorb the displaced labour in the nearby towns and urban areas. To achieve that goal, parallel projects could be implemented at the local level to spur job creation but reduce the entry barriers to non-farm employment, for example by easing access to credit (Liu and Lan, 2015). At the same time, promoting agroforestry and more intensive cultivation in remaining lands could increase agricultural income and thus reduce the incentive to return the retired land to cultivation once the programme ends (Yin *et al.*, 2013). Finally, given sufficient funds, the payments to farmers could increase to more fairly reflect their provision of ecosystem services. Braimoh and Huang (2014)

found the monetary compensation to equal only about 26 per cent of the sequestered carbon social value.

Payment to landowners: The format of the compensation to the farmers varied. Between 1999 and 2004, payments to households were in grains when there were heavy surpluses of grains in the National Grain Reserve, hence the 'Grain for Green' programme slogan.

In the middle of Phase II, the payments were changed to cash when the grain surplus was no longer available. Payments have remained in cash form since then. Compensation was given in the form of subsidies, as well as tree seedlings by the central government, and levels vary based on geographical differences and the type of intervention.

There were separate uniform payment rates in the Yangtze river basin and Yellow river basin. Given the large areas of the river basins, the uniform payment rate was not cost effective in many places. Xu *et al.* (2004) showed that the payment rate was either higher or lower than the opportunity cost of land conversion. In most cases the payment rate was higher than the opportunity cost of land conversion. This made SLCP very attractive to many households, and thus created room for rent-seeking. This is also one of the reasons why the payment rate was cut in Phase III (as well as that many households had found alternative livelihoods — especially off-farm).

Since 2005 the transfers have been in cash, and the payments are transferred to the personal bank accounts of the householders. The variety of payment types and amounts shows that adaptive management is crucial, especially in developing countries where context changes fast.

Conditionality: The duration of subsidies varies from two years if grassland is rehabilitated, to five years if commercial trees (species producing timber, fruits, nuts and other products) are established, to eight years if 'ecological' trees (species mainly providing ecological functions and services) are planted. Payments are made only after the trees have been planted with a survival rate of 85 per cent or more, yet in practice those standards have been adaptable to local conditions (He, 2014). Each year before payments are made, forested land is verified by the forest institutes affiliated to the forestry bureaus. Chinese farmers are smallholders, with an average land size of 0.5 ha per household, making verification costs high.

Monitoring and evaluation: The SFA, together with FEDRC have conducted monitoring and evaluation of the SLCP annually since 2003 and have published these reports since 2004. They also sampled 1,156 households in 100 counties and monitored implementation, payment, tree survival, household incomes and alternative livelihoods, among other factors.

The FEDRC directly reports the findings of monitoring and evaluation to the SFA. However, there is no independent evaluation, as the FEDRC, which is designated by the SFA to monitor and evaluate the programme, is affiliated to SFA which is responsible for implementing the programme. For example, the Qinghai province has formulated different appraisal methods for the various eco-compensation policies. The basic methods include county-level self-inspection and joint spot checks by provinces or prefectures (cities), where the amount of spot checks should be no less than 30 per cent of reported and completed tasks. The problem with this assessment is that it focuses on project activities and project implementation progress; not only is this incomplete, but it also lacks assessment of ecology protection and restoration.

According to NDRC (2016), there are limitations in the ability to assess the result of the considerable investments made through eco-compensation. This year sees the official launch of the **Gross Ecosystem Product** (GEP) as indicators to appraise performance at the local level (see Table 1).

Table 1. China's GEP performance indicator

In 2013, China's President Xi called for a revamp of indicators for livelihoods, social progress and ecological benefits not reflected in GDP. By 2016, over 70 counties and cities had stopped the assessment of GDP and switched to a more environmentally friendly indicator: the Gross Ecosystem Product (GEP).

GEP was proposed by the International Union for Conservation of Nature and Natural Resources (IUCN) and the Chinese Academy of Science as a GDP-based local government performance indicator that incorporates physical quantities with monetary values. It includes measures for resource consumption, environmental profit and loss, and contribution of environmental improvement to the system of economic and social development evaluation. Combined with GIS, RS and GPS, the basic data of GEP accounting can be obtained at lower costs, making monitoring more cost effective.

Using GEP assessment can have a direct impact on the way the various eco-compensation programmes are managed, for example:

providing a combined performance system at regional level, reducing monitoring costs and promoting horizontal feedback

facilitating a transition towards a more comprehensive mechanism, which integrates various policies

decentralising access to funds to local governments, with central government departments responsible for the appraisal of final results.

The GEP methodology as performance indicators has many potential benefits but it also has drawbacks with regard to social linkages where ecological considerations are important but are not the only ones for the population. While it will provide better indicators for the quality of the environment, it can also restrict local economic development and create conflict with some segments of the population.

Source: NDRC (2016)

Ability to demonstrate impact

The socioeconomic impact of the SLCP has been diverse and difficult to pinpoint, given the widely varying local conditions in the targeted areas and the rapid social and demographic changes in rural China.

Most of the case studies available show that the programme has been, to a certain degree, successful in alleviating poverty. Specifically, it has resulted in net increases in household incomes directly through its subsidies, and indirectly through its promotion of off-farm employment (Duan *et al.*, 2015; Li *et al.*, 2015). SFA's Task Force on Assessment of Socio-economic Impacts of Key Forestry Programmes (2014) reported that the payments for conversion account for about 14 per cent of the per capita income of the average household, and the poverty incidence decreased from 36 per cent in 1998 to 6.6 per cent in 2011. The Task Force had taken a sample of 1,156 households in 100 counties to monitor and assess the socioeconomic impacts of the SCLP as well as the progress and implementation of the programme.

It has also contributed to reducing income inequality, as livelihood diversification seems to have increased across all income groups with a stronger effect on low-income households (Liu and Lan, 2015; Li *et al.*, 2011). Yin *et al.* (2014) used longitudinal household data and found a larger than 250 per cent increase in household income in two provinces, mostly due to increases in off-farm income. Yet it is uncertain whether these results can be translated into long-term impact (Duan *et al.*, 2015). For example, a study in the Dunhua County highlights that 58 per cent of households participating in the SLCP considered themselves worse-off after the afforestation, and 16 per cent plan on returning to

cultivating their retired land once the subsidies end (Wang and Maclaren, 2012). Contrastingly, FEDRC and SFA (2014) reported that although 26 per cent of households claimed to be planning to reconvert their forest lands back to crop lands if the yearly payments are cut off, only 1.32 per cent of households in the SLCP did so in phase III of the programme.

A recent study in the Changting county, southeast China confirms the many benefits of PES for poverty reduction, by empowering participants' access to natural resources (Wang *et al.*, 2017). However, they highlight that this effect is only felt by those directly engaged in the programme, with little or no trickle-down benefits for non-participants. The very benefits of land tenure reforms needed to participate in PES changes the original power relationships and excludes non-participants (usually the very poor); for example, by denying access to forest resources. For China and most countries, this is a problematic trade-off — between simplifying structures to achieve scales and unwittingly excluding the most vulnerable farmers.

Lessons

Many useful lessons can be drawn from the SLCP experience, all pointing to the crucial, inextricable link between the institutions, incentives and ultimate success of a programme. Decentralisation under the SLCP focused disproportionately on distributing responsibilities rather than on fostering a local sense of ownership, causing the programme to expand too fast in its phase I and first half of phase II (1999–2005) at the cost of its budget, its democratic character and effective targeting. Recognising the trade-offs inherent between scale and targeting, the critical importance of the latter should not be understated, as revealed by the SLCP's unintended, negative impacts on the environment (water shortages and decreased biodiversity) and local livelihoods (lower incomes, higher inequality and disempowering of nonparticipants). Therefore, implementation, including compensation, should be sensitive to local heterogeneity and be guided by a management strategy that is flexible, inclusive and responsive to feedback (Yin *et al.*, 2014a). Beyond implementation, scaling up a programme of such magnitude requires a strong focus on the initial phases of planning, demonstration and piloting, as well as on strong safeguards that will maintain the programme's incentive structures long after its implementation and thus guarantee its long-term success (Yin *et al.*, 2014b; Chen *et al.*, 2015).

Fortunately, some of the lessons learned from the previous phases of the programme have been used to re-shape the programme. For example, in its latest phase IV, the programme is targeting only those who are poor, willing to convert, and whose crop lands are in a steep slope (25° in one case, and 15–25° in another). Adaptive management is vital for the programme's success, yet absence of independent monitoring and evaluation might undermine its adaptive capacity in the long run.

References

- Barton, D, K, Benavides and M, Miranda (2012) Analysing spatial PES priorities in the Osa Peninsula using the property cadastre. In: PESILA-REDD: Payments for Ecosystem Services in Latin America in the context of REDD integrating methods for evaluating the enabling conditions and cost-effectiveness of PES (2011-2014). Armenia, Colombia.
- Barton, David N, Primmer, E, Ring, I, Adamowicz, V, Robalindo, J, Blumentrath, S and Rusch, G (2011) Empirical analysis of policymixes in biodiversity conservation – spatially explicit ‘policyscape’ approaches. In: *9th International Conference of the European Society for Ecological Economics, Istanbul, 14-17 June 2011*.
- Belt and Road Portal, May 2017. The Belt and Road Ecological and Environmental Cooperation Plan. Belt and Road Portal: <https://eng.yidaiyilu.gov.cn/zchj/qwfb/13392.htm>.
- Braimoh, AK and Huang HQ (eds) (2014). Vulnerability of land systems in Asia. John Wiley & Sons, Ltd, Chichester.
- Duan, W, Lang, Z, Wen, Y (2015) The Effects of the Sloping Land Conversion Program on poverty alleviation in the Wuling Mountainous Area of China. *Small-scale Forestry* 14 (3):331–350.
- FEDRC and SFA (various) A Report for Monitoring and Assessment of the Socio-economic Impacts of China's Key Forestry Programs. Beijing: China Forestry Publishing House. Individual reports in Chinese for years 2004, 2008, 2009, 2014, and 2016.
- He, J (2014) Governing forest restoration. Local case studies of sloping land conversion program in Southwest China. *Forest Policy and Economics* 46:30-38.
- Huang (2016) Big Floods in 1998. <http://goo.gl/BdY0Fk>
- Jin, L and Wenjuan, Z (2010) Conference Paper 1: Eco-Compensation in the Environmental Policy Tool Kit. In: Zhang Q *et al.* (eds.) *Payments for Ecological Services and Eco-Compensation: Practices and Innovations in the People's Republic of China*. Asian Development Bank, Manila.
- Li, H, Yao, S, Yin, R, Liu, G (2015) Assessing the decadal impact of China's sloping land conversion program on household income under enrollment and earning differentiation. *Forest Policy and Economics* 61:95-103.
- Liu, Z and Jin, L (2015) The Sloping Land Conversion Program in China: Effect on the Livelihood Diversification of Rural Households. *World Development* 70:147-161.
- NDRC (2016) Developing Gross Ecosystem Product Accounting for Eco-Compensation (Interim Report). In: *ADB TA-9040 (PRC). Project Group*. National Development Reform Commission, Kunming.
- SFA (2014) SFA's Task Force on Assessment of Socio-economic Impacts of Key Forestry Programmes: ten-year's Review on Assessment of the Socio-economic Impacts of National Key Forestry Programmes. *Forestry Economics* 1:10-21.
- Song, X, Peng, C, Zhou, G, Jiang, H and Wang, W (2014) Chinese Grain for Green Program led to highly increased soil organic carbon levels: a meta-analysis. *Scientific reports* 4:4460.
- UNEP (2016) Green is gold: the strategy and actions of China's Ecological Civilization. UNDP, Geneva.
- Wang, C and Maclaren, V (2012) Evaluation of economic and social impacts of the sloping land conversion program. A case study in Dunhua County, China. *Forest Policy and Economics* 14 (1):50-57.
- Wang, C, Pang, W and Hong, J (2017) Impact of a regional payment for ecosystem service program on the livelihoods of different rural households. *Journal of Cleaner Production* 164:1058-1067.
- Xu, Z, Bennett, M, Tao, R, Xu, J (2004) China's Sloping Land Conversion Program four years on: current situation, pending issues. Special Issue: Forestry in China – Policy, Consumption and Production in Forestry's Newest Superpower. *The International Forestry Review* 6 (3-4):317-326.
- Yin, R, Liu, C, Zhao, Yao, S and Liu, H (2014) The implementation and impacts of China's largest payment for ecosystem services program as revealed by longitudinal household data. *Land Use Policy* 40:45-55.

Yin, R, Zhao, M and Yao, S (2013) Designing and implementing payments for ecosystem services programs: what lessons can be learned from China's experience of restoring degraded cropland? *Forest Policy and Economics* 35:66-72.

Zhang, Q, Bennett, M. T., Kannan, K and Jin, L (2009) 'Payments for ecological services and eco-compensation: Practices and innovations in the People's Republic of China'. Paper presented at the International Conference on Payments for Ecological Services, Mandaluyong City, 6–7 September 2009.