



1. Project Data

Project ID

P125021

Project Name

CN-Hunan Forest Restoration

Country

China

Practice Area(Lead)

Environment, Natural Resources & the Blue Economy

L/C/TF Number(s)

IBRD-82150

Closing Date (Original)

31-Mar-2019

Total Project Cost (USD)

80,000,000.00

Bank Approval Date

17-Jan-2013

Closing Date (Actual)

31-Mar-2019

IBRD/IDA (USD)
Grants (USD)

Original Commitment

80,000,000.00

0.00

Revised Commitment

80,000,000.00

0.00

Actual

80,000,000.00

0.00

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2. Project Objectives and Components

a. Objectives

The statements of the Project Development Objective (PDO) in the Loan Agreement (LA), Project Appraisal Document (PAD) and Implementation Completion Report (ICR) are identical.

The project development objective is to: enhance the *resilience* and *environmental function* of selected ice storm affected ecological forest plantations in Hunan Province by increasing forest species diversity and vegetative tree cover in those areas. (ICR p1, PAD p2, LA p5).



Note that in relation to the PDO, the ICR uses environmental function and ecosystem function as interchangeable, confirmed by the Task Team. This ICR Review treats the following as the project objectives:

- PDO 1: enhance resilience of selected ice storm affected ecological forest plantations in Hunan Province
- PDO 2: enhance environmental function of selected ice storm affected ecological forest plantations in Hunan Province

The ICR describes the purpose of the project to be: "to address forest resilience to natural disasters and climate variability, and improve the provision of ecosystem services such as soil water retention, soil conservation, and pollution control." (para 5). Other indicators for environmental function, include carbon sequestration and soil erosion. Indicators of resilience include biodiversity wood tensile strength and resistance to biological pest, weeds and disease. (ICR para 29).

The ICR defines resilience using the Bank's guidance for the evaluation of resilience-building operations (2017) (ICR footnote 20): "climate and disaster resilience is about the ability of individuals, households, communities, institutions or higher-level systems to deal with shocks and stressors without undermining their welfare or functions." In the case of this project, the "community" is the ecological forest community, with functions defined by its ecosystem services. It does not provide a specific definition of environmental function.

b. Were the project objectives/key associated outcome targets revised during implementation?

No

c. Will a split evaluation be undertaken?

No

d. Components

The following summary is taken from ICR p9, and is a faithful summary of the PAD.

Component 1: Reforestation and rehabilitation of damaged ecological forest plantations (cost at appraisal: US\$98.22 million; actual cost: US\$103.22 million) (ICR p47). This component had two parts:

1. *reforestation* of ice storm-denuded forest areas through replanting; and
2. *rehabilitating* ice storm-damaged forest areas through i) interplanting and ii) assisting natural regeneration (nursing spontaneous regrowth and partial replanting) (PAD p3).

Component 2: Institutional support and technology enhancement (cost at appraisal: US\$11.73 million; actual cost: US\$11.70 million). This component had 5 parts:

- a. *Nursery upgrading and planting material development*: Improve nursery management techniques, increase seedling production (particularly of broad-leaf indigenous species), and upgrade facilities at three provincial nurseries.



- b. *Forest cooperatives*: Establish or Strengthen 22 farmer forest cooperatives through provision of office equipment, vehicles, construction of small roads, and technical assistance for development and implementation of forest management plans.
- c. *Research, Technical Service and Extension*: Applied research, capacity building and knowledge dissemination, covering: (i) nursery technologies and management, (ii) silvicultural management systems, (iii) ecological forest plantation management, (iv) enhancing and monitoring carbon sequestration in forest plantations, and (v) climate change impacts on forest ecosystems.
- d. *Monitoring and Evaluation (M&E)*: Establish and implement the project's monitoring and evaluation system.
- e. *Project Management and Institutional Development*: Capacity building and institutional strengthening for Project Management Offices (PMO) at provincial and county levels

e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

The ICR reports that project was completed on time and on budget (p1).

Key dates: The project was approved on 17 January 2013 and became effective on 7 May 2013. The midterm review completion was 4 May 2016. The original and actual closing dates were 31 March 2019.

Costs: IBRD loan of US\$80M approved and US\$79.8M disbursed (plus US\$0.2 front end fees). The Borrower contribution at approval and actual disbursed was \$US35.2M (PAD p4, ICR p2). The total project cost was US\$115.2M, including US\$5.05M contingency budgeted at approval, plus \$0.2M front end fees. The IBRD loan represents 70.8 percent of the total project cost (including front-end fees) (ICR p107).

Component I costs increased by US\$5.08M. This increase was financed by the US\$5.05M contingency plus a transfer of US\$0.3M from component II (ICR p47). This was made possible by a reduction in upgrading nurseries from 3 to 2 (see discussion at Section 5).

3. Relevance of Objectives

Rationale

The overall PDOs of *enhancing resilience and environmental function* of forests in Hunan Province were highly relevant to the context of both acute instances of ice storm damage, as well as the longer-term deterioration of China's natural resources. These were clearly identified by both the Chinese government and World Bank teams, and through independent research (see ICR e.g. p5 and 7). The project's approach took account of the capacity and previous experience of the implementing agency (e.g. PAD para 29 and 46) and the Bank itself (PAD Section IB).

The objectives were strategically aligned to and supportive of Hunan Province's increasing focus on diverse, indigenous, *multifunction* (i.e. of ecological and economic benefit) forests. This was expressed in the Government of China's 12th Five Year Development Plan (2012) and the Banks's Country Partnership



Strategy (CPS) China: 2013-2016. Specifically, the project aligned with the CPS strategic themes of *support for greener growth and inclusive development*.

The project considered both immediate forest restoration requirements for direct environmental benefit, as well as the need for new and long-term silviculture techniques that would support better environmental, socio-economic and commercial benefits of the forests into the future (ICR para 24). The project built upon previous Bank experiences in China's forestry sector and explicitly incorporated lessons from earlier projects into the project design and implementation (PAD p5).

The components were highly complementary, combining direct reforestation and rehabilitation activities (Component I) with institutional strengthening and technology enhancement activities (Component II) to underpin achievement and sustainability of the PDOs. As discussed below (Section 9 *M&E*), however, there were some gaps in intermediate-level indicators against some Component II activities, which blurred links to some elements of sustainability of outcomes.

The ICR points out that the project objective had ongoing relevance to both Bank and Chinese Government policies (including Hunan Province itself, ICR para 27). It was closely aligned with the Bank's draft Country Partnership Framework 2020-2025, and China's 13th Five Year Plan (2016-2020) (ICR para 25). The project informed upcoming World Bank and European Investment Bank projects in China (ICR para 24). Additionally, the project directly supported China's climate policies, including its contribution to the Paris Agreement and its own National Plan for Climate Change (2014-2020) (ICR para 26-27).

Relevance of Objectives is rated *high*, based on full alignment with the relevant Bank and Chinese Government strategies, close consideration of environmental, social-economic, political and institutional context and capacity, including shifting trends over time, and capitalizing on the Bank's previous sector experience in China. The PDOs were appropriately ambitious, taking into account these contextual factors.

Rating

High

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

Objective 1: to enhance resilience of selected ice storm affected ecological forest plantations

Rationale

This sub-section (Objective 1) sets out the project's overall theory of change and summarizes outputs, then discusses Objective 1 Outcomes.



The following sub-section (Objective 2) discusses Objective 2 Outcomes and then overall cross-cutting intermediate outcomes.

OVERALL THEORY OF CHANGE - PDOS 1 and 2

The Theory of Change (TOC) for the overall project was clearly evident and logical (although not explicit) in the PAD's Project Description (p3) and results framework (RF). Activities were linked to outputs and grounded in the project's implementation context. The ICR developed an explicit depiction of the TOC (Figure 2, p8), which accurately reflected the PAD and clearly set out the relevant assumptions (ICR Annex 7).

According to the ICR (p8) and the PAD (Section IIC), the achievement of both PDOs was dependent on the same set of mutually supportive outputs at the PDO and intermediate levels, without distinction – forest resilience *and* environmental function would improve by increasing forest species diversity *and* vegetative canopy cover.

Therefore, below, **this ICRR first sets out the key outputs and targets for the project overall, then discusses separately, outcomes against each PDO.**

- Increased *resilience* would be basically indicated by: 'increased diversity of species and tree structures in the replanted or rehabilitated forests' (PDO level indicator 1) (ICR para 14)
- Increased *environmental function* would be indicated by: 'increased tree canopy cover in (i) fully replanted forests, (ii) partially replanted forests, and iii) naturally rehabilitated forests'. (PDO level indicator 2) (ICR para 14).

Component I activities (reforestation and rehabilitation) would apply to both PDO level indicators, including a community consultation model for site selection (ICR p8). Component II activities (institutional support and technology enhancement) would integrally underpin achievement of both PDOs, to ensure sustainability of plantations, as well as of the project's concepts and techniques, even beyond the project's sites (ICR para 12).

Outputs:

- **43 species introduced** (108% achieved: baseline 4, target 40). 44 percent were resilient, previously uncultivated, indigenous broadleaf species (ICR p32). This activity was positioned as both an output and an outcome of the project.
- **61,986ha restored and/or reforested** (105% achievement: target of 58,900ha from baseline of 0 – ICR p13). This comprised three types of reforestation:
 - a. full reforestation target was 118% achieved (baseline 0, target 27,700ha, achieved 32,651);
 - b. areas partially replanted was 117% achieved (baseline 0, target 18,600ha, achieved 21,673ha);
 - c. areas naturally regenerated with treatment (from the project) achieved only 61% of the target (baseline 0, target 12,600ha, achieved 7,662).



- **2 upgraded nurseries** able to produce high quality seedlings of indigenous species (Target 67% met: Target 3, completed 2). The upgrades consisted of construction of facilities; new equipment and materials; and staff training.
- **96.4 million seedlings produced** for the project reforestation and rehabilitation (Target 159% achieved: baseline 0, target 60.5 million). 15.5 million of these were produced by the nurseries upgraded through the project, with the remaining coming from existing nurseries.
- **22 forest cooperatives established or strengthened** and able to complete operational plans (Target 100% met: target 22). Support provided in the form of office equipment, vehicles, construction of small roads, and the provision of training for forest farmers and managers (ICR p36). After project close, all operational plans were satisfactorily completed (TTL interview).
- **5 ongoing research programs established**, producing extensive research work in five different areas closely related to the PDO, accompanied by publication of 20 scientific articles, a patent and two science and technology awards (ICR p 42) (Target 100% met: baseline 0, target 5) – an output and intermediate outcome.
- **3 workshops delivered** to disseminate project knowledge and experience (Target 100% met: baseline 0, target 3)
- **14,070 person hours of training provided for management staff** on project management and technical innovation (target exceeded by 102%: baseline 0, target 13,800).
- **62,294 person hours of training provided for project beneficiaries** on project concepts and techniques (overall target 103% met: baseline 0, target 60,200 person hours).
 - Of those, 11,598 person hours were provided to women (Target 114% met: baseline 0, target 10,100).
 - Of the total person hours provided, 4,960 were to ethnic minority/indigenous peoples: (Target 165% met: baseline 0, target 3,000)

OUTCOME:

Objective 1: *Enhanced resilience*

The indicator at PDO level (*increased diversity of species and tree structures in replanted/rehabilitated forests*) was 108% achieved (43 species being introduced against a target of 40 and a baseline of 0). Most of the contributing intermediate level indicators were also clearly achieved and some surpassed. The ICR reports a survival rate of around 95% for trees planted (para 31). Of the 43 species introduced, 38 were native to Hunan Province (ICR para 32), indicating a higher likelihood of resilience themselves (ICR para 42).

The ICR points to further tangible evidence of increased overall forest resilience (built into the project's M&E but not indicated in the results framework) such as: reduced pest and disease occurrence rates by 29-75 percent among afforestation models (ICR p41); and improved physical tree strength (density by 8-9 percent, flexural strength (i.e. maximum bending stress able to be tolerated before breaking) by 65-68 percent, elasticity by 71-73 percent, and compression strength 11-13 percent in most common species – ICR p42), contributing to greater resilience to adverse weather. The ICR also notes that the project used the highest number of species of any provincial forest project to date and could serve as a model for future projects (ICR p32).



Overall, the efficacy under Object 1, *increased resilience*, as indicated at PDO level, was high, based on the project exceeding its targets at PDO level (and most at intermediate level), and supported by evidence collected through the project's research activities.

Rating

High

OBJECTIVE 2

Objective

Objective 2: to enhance environmental function of selected ice affected ecological forest plantations

Rationale

Please see detail above for Objective 2 Outputs summary

OUTCOMES

Objective 2: *Enhanced environmental function*

The PDO level basic indicator for this objective (*increasing incremental tree canopy cover to improve environmental protection function*) was exceeded. This indicator had three sub indicators: Tree canopy cover increased in:

- (a) fully replanted forests by 232%, (*Baseline* of 0, target of 25%, achieved 68%);
- (b) partially replanted forests by 127% (baseline of 32%, target 42%, 61% achieved); and
- (c) treated naturally regenerated forests by 124% (baseline of 24%, target 50%, achieved 62%) (ICR p33).

Exceeding sub indicator (a) by such a large margin as explained by the project team as a combination of: higher usage of sites with original vegetation, good quality and higher than expected survival rates of seedlings, and more extensive use of indigenous broadleaf species, as their value was demonstrated to local communities over time. Initial conservative estimates were reasonable, given the new approach for the local area.

The ICR presents several types of evidence in support of increased environmental function broadly. It states that the tree canopy coverage for all eight forestry models (in 8 pilot areas) under the project was higher than that of the control forests (para 33). The project's research activities further demonstrated the environmental function of the forests through reduced rates of soil erosion (41-44 tons per ha for project forests compared to 48 tons per ha in control stands of forest) and runoff (225-243mm in afforestation models compared to 271mm in control stands over same five-year period). Soil water storage capacity was also higher. Taken together, this was reasonably expected to lead to water catchment benefits (ICR para 36) into the future. Relative to baseline conditions, improvements in soil quality were also recorded in contaminated ex-industrial sites, indicating the positive potential of the reforestation to mitigate pollution (ICR para 37). None of these elements were explicitly built into the results framework, although the PAD indicates that the



implementing agencies included them in their monitoring plan (P25), but they do offer convincing support to achievement of PDO2.

Overall, the efficacy under *increased environmental function* as indicated at PDO level, was high based on exceeding all targets and strong complementary evidence collected through the project's M&E and research.

Cross-cutting Intermediate level Outcomes (i.e. outcomes that equally supported PDOs 1 and 2)

Component I (Reforestation and rehabilitation of damaged ecological forest plantations): At the intermediate level, this component had one target (with three sub-targets): *Area restored/reforested*, which applied to achieving both PDOs (see Project Results Summary table above). Overall, reforestation targets were surpassed but the sub-target for natural regeneration was not met (61 percent achieved). However, the site self-selection model for farmers anticipated that target predictions would likely shift (ICR p35). The natural regeneration model proved least popular, due to being least well suited to individual circumstances. Thus, the shortfall is understandable. Evidence in the ICR of achievements against Component I was strong, since the nature of the indicators and outputs were quantifiable and measurable. There was a direct clear line of sight between the inputs and both increased resilience and ecosystem/environmental function.

Component II (Institutional support and technology enhancement): This component had 7 indicators (plus some sub-indicators), all at intermediate level (i.e. designed to support PDO level indicators). Evidence in the ICR of the contribution of these outputs to achieving the PDOs is more mixed. There is sufficient evidence that most of the indicators were met and some exceeded (see Key Outputs above). But the heavy quantitative focus of the indicators (all output-based) makes it more difficult in some instances to see evidence of the contribution to the PDOs, of broader qualitative elements of institutional strengthening and sustaining new silviculture practices in particular.

See analysis of each intermediate indicator below, related to its efficacy in supporting achievement of both PDO 1 and 2.

- **Number of upgraded nurseries**: although only two nurseries were upgraded, not the planned three (one was completed ahead of the project, making project financing redundant, resulting in informal target revision – no restructuring – ICR para 18), this does not seem to have adversely affected the project overall. The capacity and quality of seedling production from the upgraded nurseries increased (ICR p36) and was of high quality and the target for seedling production was exceeded overall (see below). The change afforded savings of around US\$800k, largely absorbed by Component II activities, such as extra training that was provided, and some extra planting activities as part of Component I. Exact figures were not available (source: Task Team Leader (TTL) interview). The TTL also confirmed that upon project completion, seedling production from the upgraded nurseries exceeded expectations and requirements for PDO achievement, and contributed to broader Provincial production capacity beyond the needs of the project itself.
- **Number of seedlings produced for the project reforestation and rehabilitation: Target 159% achieved**: of 60.5m was exceeded by 159% (96.4m produced) – 15.5m were produced by the nurseries upgraded through the project, with the remaining coming from existing nurseries. Forty four percent of the total were the desired broadleaf species (central to enhancing resilience and environmental function (ICR p55)), which were previously unavailable (ICR para 42).
- **Number of forest cooperatives established or strengthened with their operational plans completed (Target 100% achieved)**: This indicator was all output based and did not provide a qualitative picture of impact or quality of the activities. No further information is provided on the quality or impact of



these. The ICR does indicate that 70.5 percent of surveyed households considered that the 'capacity of forestry cooperatives had improved' (ICR para 42), although it does not indicate by how much nor whether these improvements would be adequate for sustaining the PDOs.

- **Research and technical services extension**

- *Number of on-going research programs (Target 100% achieved):* The ICR describes extensive research work in five different areas closely related to the PDO, accompanied by publication of 20 scientific articles, a patent and two science and technology awards (ICR p37).
- *Number of workshops to disseminate project knowledge and experience (Target 100% achieved):* The ICR does not assess the effectiveness or impact of these workshops.

- **Number of management staff trained on project management and technical innovation (Target 102% achieved):** Evidence of the efficacy of the training is presented as results from household interviews, showing that 92 percent of those surveyed reported obtaining skills and knowledge from the training. 85 percent reported more efficient working practices as a result (ICR para 41). This underwrites achievement and sustaining of the PDOs.

- **Number of beneficiaries trained (overall target 103% achieved).** Of those:

- *Female: (Target 114% achieved).* Given the target for training women (at around 16% of total farmers) was convincingly surpassed, but that the percentage of women in poor and ethnic minority areas specifically was 51% and 72% respectively, it indicates that the target for training women was perhaps, set too low at appraisal. There is, however, no data presented in the ICR regarding the percentage of female farmers overall, in relation to the target for training them.
- *Ethnic minority/indigenous: (Target 165% achieved):* The TTL confirmed that exceeding this target was principally due to decisions to intensify training for these groups in order to meet identified needs and address risks. It was not that the training was necessarily extended to more people. Extra training was provided on economic and medicinal crop planting and management techniques to help income generation for poor farmers (TTL interview). The ICR notes that there were delays to implementation in ethnic minority areas, 'due to labor and land shortages, outside the Bank's control' (ICR para 70). Perhaps these delays could also have been further minimized however, had data collection on these risks been stronger at appraisal.

- **Indicator: M&E: system fully operational (Target 100% met).** The ICR reports (p38) that the M&E system was fully functional from the first implementation status report (May 2013) and throughout the project.

Rating
High

OVERALL EFFICACY

Rationale

In summary, the ICR demonstrates the project surpassed both its PDO level indicator targets and sub indicators. In the Results Framework, both these indicators were positioned to contribute to achieving both PDO 1 and 2 (increase *resilience* and *environmental function*) without distinction.



The overall efficacy rating of the project is *high*, based on strong evidence of having met or surpassed both PDO level indicators, and having links between the inputs, particularly of Component I, and the overall outcomes. Intermediate targets against Component II were also largely met, and some exceeded.

Overall Efficacy Rating

High

5. Efficiency

Economic Efficiency:

The ICR's Economic Efficiency analysis (Annex 4) states that cost-benefit analysis was undertaken at project closure to re-assess the project's economic viability at completion, using the same approach as at appraisal. The higher Economic internal rate of return (EIRR) at completion (21.3 percent) than appraisal (17.6 percent) (ICR para 46) is explained in the ICR (p49) as mainly due to increased carbon value. The ICR also notes the assessment is considered conservative, given the exclusion in this analysis of 'not-readily-quantifiable economic benefits' such as biodiversity conservation, landscape amenity improvements and contributions to agricultural tourism.

Financial analysis undertaken to evaluate incentives for beneficiaries to participate in the project, calculated the overall all financial internal rate of return (FIRR) as 8.3 percent (7.9-9.2 percent across models), slightly lower than at appraisal (at 8.1-10.1 percent across models), due primarily to input price increases including labor (ICR para 4.7 and 112). The ICR states that these were, however, 'broadly in line with stakeholder expectations (para 112). All forestry models proved financially attractive to farmers, with effective FIRRs for individuals above 12 percent. This was supported by grants from Bank loan proceeds, provided to subsidize costs of establishing forestation models.

Adjustments to component costs were managed within the existing overall budget (ICR para17) using existing contingency funds and a transfer from Component II to I, of around \$300K (2 rather than three nurseries were upgraded – see Section 4). The changes were based largely on the success of and need for more demonstration forests, and expected variations in preferred site selection by farmers (ICR paras 17-19).

Despite foresight in the PAD (table 3-2 p31) and resulting attempts to minimize issues, some relatively minor counterpart funding challenges did occur, such as delays in the early years (ICR para 66, 88). These were reportedly common in provincial level projects in China (ICR para 65). The ICR states they were relatively minor and successfully addressed by the time of the MTR, through Bank team supervision and support (ICR para 88).

Administrative Efficiency:

According to the ICR, project implementation efficiency was high (para 114), citing most activity completion ahead of schedule; loan proceeds disbursed a year ahead of schedule (p56); similar component costs at appraisal and completion (components I and II were at 105.2% and 99.7% of approval estimates respectively); and comparable costs to other forestry projects (presumably Bank projects).



The ICR also notes several other factors that likely contributed to efficient implementation, namely: that the project actively incorporated lessons, recommendations and analysis from earlier Bank operations (ICR Figure 1, para 62 and footnote 40); clear, simple project design, well suited to the context and objectives (para 63); and high local capacity and familiarity with project processes at the provincial level (para 64). The ICR also points to a number of additional positive outcomes and impacts (p18-19) – discussed in section 10c below – suggesting the efficient use of resources overall.

The project did, however, face some challenges regarding implementation (ICR para 66), such as: early stage incomplete understanding of the project's philosophy and techniques amongst farmers and at county level (ICR para 67), resulting in for example, overly dense planting in early years, compromising biodiversity objectives. This was satisfactorily addressed through increased training (with budget reallocated to training from items such as vehicle purchase (rentals were used instead ICR para 48) and overseas trips; increased coordination between planting and research activities (components' I and II respectively); and increased use of demonstration farms. A short severe drought caused 40-50 percent seedling mortality rates in some sites. Delays in planned project activities in ethnic minority areas (due to rapid economic growth leading to labor shortages; remote locations and market access concerns; and land constraints due to other government programs – ICR para 67) necessitated an informal revision of targets in those areas. Both issues were addressed in relatively timely and cost-effective ways (para 69 and 70).

The project's efficiency is rated *substantial*, based on good EIRR, reasonable FIRR, minimal budget adjustments (within project resources), reasonable and timely target adjustments, and clear evidence of meeting project objectives in a timely way overall, within the planned and approved financial and human resources. The moderate shortcomings (i.e. requiring shifting of resources to fully embed the project's innovative approach) were successfully addressed.

Efficiency Rating

Substantial

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal	✓	17.60	0 <input type="checkbox"/> Not Applicable
ICR Estimate	✓	21.30	0 <input type="checkbox"/> Not Applicable

* Refers to percent of total project cost for which ERR/FRR was calculated.

6. Outcome

The project's overall rating of *highly satisfactory* is based on high relevance, high efficacy and substantial efficiency. The project was well suited to its context and the needs and capacity of stakeholders. Valid evidence (according to the project's results framework indicators) of increased resilience and environmental function is



strong, supported by extensive research output of broader and longer-term relevance. Project resources were appropriately used in a timely way. Extensive focus and Component II resources were also necessarily given to ensuring successful embedding of the innovative silviculture techniques introduced by the project. These adjustments were central to achieving the very strong physical outcomes of the PDOs themselves.

a. Outcome Rating
Highly Satisfactory

7. Risk to Development Outcome

Overall, the risks to the project's development outcome are relatively low. The project's outcomes face environmental risks, such as storms, fire and pests but are relatively unlikely (ICR para 99-100). The project itself also successfully focused on reducing these risks through PDO1. Some risks to sustaining the new technical approaches introduced by the project may exist, since the challenge of embedding them was significant and data to support the eventual depth of its uptake was somewhat thin (see section 9 below).

Institutional risks appear low, given: a) the alignment of the project with an established forest management system, budget and set of expertise (ICR para 98); b) the commitment of the Government to continue the program, demonstrated by the follow-on projects planned and the extension of the approach to other areas (e.g. ICR para 59) (although not convincingly demonstrated by the project's own RF, given the exclusively output-based indicators in this regard – see section 9 *M&E* below); and c) strong incentives built into the project over time, for continued engagement by farmers and stakeholders (e.g. ICR para 113).

The ICR reports that policy or market changes could affect the incentives for maintaining the project's approach, particularly given the need for ongoing public subsidy of these forests. These were considered unlikely overall and the project's incentive structure aimed to mitigate such effects (ICR para 101), although these could not be assessed within the timeframe of the project.

8. Assessment of Bank Performance

a. Quality-at-Entry

The ICR provides strong evidence to confirm good quality at entry. Comparison with the PAD demonstrates that all necessary and complementary elements for successful achievement of the PDO were established at approval (e.g. see PAD section III.A – *Project Components*). This was demonstrated by the fact that changes that took place through the course of implementation were both relatively minor and able to be accommodated within the existing plans, components and financing of the project. The inferred Theory of Change in the PAD remained relevant throughout, with the exception of the challenge of embedding the innovative practices being underestimated, although it was recognized (ICR para 102). Actual EIRR and FIRR estimates were relatively accurate against completion, demonstrating thorough initial economic analysis.



The project was responsive to jointly identified needs (by the Bank and Chinese Government). It was context appropriate, aligned with country and Bank strategies and sector experience over time, and with current research (see ICRR section 3; PAD Section B; and ICR figure 1, p6). The ICR sets out ways in which the technical project design proved simple and sound (e.g. ICR Section C), with highly complementary, measurable and attainable activities, including M&E design and risk management (see ICRR sections 5 *Efficiency* and 9 *M&E*). Lessons from previous projects, e.g. the importance of demonstrating new approaches and the existing solid capacity in the sector) were deliberately incorporated into the design (see PAD Section C). Also supporting successful implementation overall were efforts to ensure a participatory design process (PAD para 21); and the location of project implementation arrangements at provincial level where there was appropriate capacity.

The ICR also confirms (para 67) that the central challenge and risk of the project was ensuring sufficient understanding and embedding of the project's innovative techniques – as identified in the PAD (e.g. paras 17, 18, 28 and 29), but the challenge exceeded expectations and required corrective action (ICR para 102 and 103), such as extra training, better connection between research and planting activities and increased use of demonstration sites (ICR para 68). But because the project RF did not provide indicators to drive assessment of how well these techniques were taking hold (e.g. behavior and perception change), these critical adjustments were made as a result of good management decisions – rather than being provided for in structure of the results framework. Inclusion of such indicators could have further minimized corrective action and risks to PDO achievement and sustainability that rested on embedding these techniques (see also section 9 below).

Insufficiencies in socioeconomic baseline data collection, for example, substantial variation in samples between survey periods and low sample density (ICR para 78), especially in ethnic minority areas, hampered both efficacy and assessment of socioeconomic benefits (ICR para 68). This did not, however, affect the overall achievement of the PDOs (since this data did not affect the environmental data against which the PDOs were measured – see further discussion in ICR Section 9 *M&E*). Minor financial and contract management deficiencies delayed disbursement in the early years, but were subsequently adequately addressed (ICR para 88 and 90).

Quality at entry is rated *satisfactory*, based on the ICR's reporting of and confirmation at completion that appropriate plans, structures, risk and economic assessments were in place. The results framework, however, lacked indicators of behavior change related to embedding new techniques that were critical to both achieving and sustaining the PDOs. Neither did it allow for demonstration of the socioeconomic impacts of the project. Overall though, the project design coupled with good management decisions regarding adjustment of resources, was able to successfully address issues that arose. The theory of change remained relevant and the outcomes of the project met or exceeded targets.

Quality-at-Entry Rating Satisfactory

b. Quality of supervision

The ICR reports that the Bank actively tracked progress; performance reporting, including safeguards tracking. Reporting was candid, comprehensive and timely (para 96). The Bank team used the mid-term review (MTR) and other monitoring to successfully respond to changes in context and made necessary



adjustments to implementation, for example: decreasing planting areas in ethnic minority areas, due to labor and land shortages resulting from rapid economic development (para 22); increasing demonstration forest areas due to their effectiveness in engaging the beneficiaries; increasing training and connections between activities within the project to ensure knowledge transfer and better embed the innovative techniques of the project ((para 68) - the central challenge of the project. As such, the latter two examples were key to achieving the PDOs and increasing likelihood of sustaining them.

The ICR points to the Bank's supervision as key to resolving some minor financial management and procurement deficiencies (paras 88-90). The Bank team also mobilized external resources (such as Food and Agriculture Organization (FAO) forestry specialists) where needed (ICR para 96).

The Bank team leader remained the same throughout and maintained strong relationships with the client. This is confirmed in ICR para 71 and annex 5 *Borrower Comments*, which commended the Bank task team for their 'outstanding contributions' to successful implementation.

Quality of Supervision Rating

Highly Satisfactory

Overall Bank Performance Rating

Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

The ICR described the M&E design overall as thorough, realistic, practical and clearly indicative of achieving the PDOs (para 72), despite the lack of an explicit theory of change in the PAD. The indicators of PDO achievement were clear, measurable and achievable and the relationship to both PDOs was evident.

The intermediate level indicators and sub indicators spanned components I and II. Against component I (*reforestation and rehabilitation of damaged forests*) in particular, indicators were clear, measurable and achievable, given their quantitative focus, appropriate to the related objectives.

Against Component II (*institutional support and technology enhancement*), all indicators were likewise quantitative and all output-based. Although also clear, achievable and related to achievement of both PDOs, they did not allow for sufficient capture of some of the qualitative outcomes sought – such as evidence of institutional strengthening (not just inputs or outputs) through behavior or perception changes (e.g. socializing and embedding the new techniques of the project, described in the ICR as *the central challenge* of the project – paras 98 and 67). Neither is there discussion of the impacts on beneficiaries, of the project's technological enhancements.

Consequently, the lack of qualitative indicators or their proxies, meant the project results framework had limited scope to demonstrate the sustainability of its innovative approaches. Therefore, it was also limited in demonstrating the sustainability of the project outcomes.



The M&E design did appropriately include surveys of various stakeholder groups during and at completion of the project that considered these issues, but did not link the results of these surveys to achievement of the PDOs in any way. Further, the ICR describes deficiencies in socio-economic data collection through these surveys (e.g. para 78). Had it not been for the other ‘unintended outcomes and impacts’ of the project, such as uptake of the approach elsewhere (ICR para 59), assessment of sustainability of the project’s approach and the project’s ability to have addressed its own ‘central challenge’ would have been much less convincing. (See also section 12 *Lessons* below.)

The ICR describes minor gaps in the M&E design, being the absence of snow and wind event metrics, which could have been helpful in establishing likelihood of longer-term resilience of the forests to winter storms (para 78). This indeed appears to be a minor deficiency, given the other strong evidence provided and what was realistically within the project’s control to monitor.

Other significant strengths of the M&E design which enhanced the quality of outcome assessments were: provision for continuous input from experts during project implementation (PAD p42) to manage risk and maximize benefits of project activities; control sites for comparison, drawing on extensive local data collection capability; and detailed additional metrics (e.g. soil water retention, erosion, pollution abatement) (ICR paras 74 and 75).

b. M&E Implementation

Responsibility for implementation of M&E system was well placed with the Provincial Project Management Offices, which had the necessary capacity and expertise (ICR para 77). They were also appropriately invested in the project to carry out the responsibilities. County Project Management Offices (CPMO) were appropriately supported to build needed skills and capability, and largely carried out the responsibilities well. Overall, according to the ICR, reporting was regular and on time. Data collection was carried out as planned and methods were rigorous (ICR para 77).

But the ICR identifies ‘significant shortcomings in socio-economic data collection’ which “prevented causal attribution of the project’s socio-economic impacts” (ICR para 78), particularly in ethnic minority areas. This included ‘inadequate assessment of risks and opportunities’ (ICR para 65), describing this as a ‘missed opportunity’ to better target the project’s ethnic minority activities. This also infers possible deficiencies in data collection plans themselves (since data collection was reportedly carried out ‘as planned’ – ICR para 77). The socio-economic impacts and outcomes appears to constitute a blind spot for the project.

The ICR also points out, however, that these deficiencies did not detract from measuring progress towards the PDOs (given the results framework focussed on quantitative environmental changes, not on socio-economic ones). But these shortcomings may have undermined assessment of some sustainability elements of the PDOs, such as the extent to which the innovative techniques were embedded locally (see sections 9a and 9b above, and section 12 below).

c. M&E Utilization

Utilization of the data generated by the project appears to be strong: from consistent comparisons with control sites and traditional methods; incorporation into evaluation of the project’s own results, providing



a basis for future projects; to broad dissemination of research results (including workshops and numerous publications – see ICR footnote 40) to a range of stakeholders (ICR para 80).

The MTR resulted in several useful changes to project implementation to address identified challenges, such as: informal, mutually agreed adjustments to several targets – e.g. targets for area planted in ethnic minority areas were revised down from 810 ha to 676 ha (with no changes to the results framework) – which were subsequently met (see Section 4 Efficacy above); increases in training budget and changes to training plans to strengthen understanding of the project's techniques; and increased coordination between component I and II activities (ICR para 68) to ensure knowledge transfer.

The overall M&E Quality rating is *substantial*, based on good alignment of the results framework with demonstrating achievement of the PDOs as stated, several minor shortcomings in design, moderate shortcomings in implementation but good use of project generated data and information, including to inform other and future projects.

M&E Quality Rating

Substantial

10. Other Issues

a. Safeguards

The safeguard policies triggered under the project were Environmental Assessment (operational policy (OP) 4.01), Forests (OP 4.36), Pest Management (OP 4.09), and Indigenous Peoples (OP 4.10). The project was classified as Category B (partial assessment). (ICR p26, PAD p12, 13, 38). Overall, the project's safeguard compliance was rated satisfactory throughout.

Environmental safeguards: Environmental protection was a priority of the project, evidenced by strong complementarity of safeguards with technical design (ICR p26) and incorporation of 'environmental protection compliance rate' as a criterion for execution of the Environmental Protection Guidelines (EPG) and Environmental Management Plan (EMP), and some activities exceeding EMP requirements (ICR para 84). The ICR states that 'the EMP, including EPG and the PMP, were generally well followed' and that minor exceptions, such as burning of plant debris and use of some pesticides, were addressed quickly (ICR p 26).

Social safeguards: Required safeguards, were in place at appraisal and compliance was satisfactory (ICR para 82). But the assessments of the social and cultural impacts (positive or negative) on the relevant social groups, including ethnic minorities, was neither part of the PDOs (see Safeguards data sheet ICR p5) nor possible. According to the ICR (para 86) and the PAD (paras 39-43) the project did 'pay careful attention' to ethnic minorities, beginning with a social assessment exercise during preparation, including an Ethnic Minority Development Plan (EMDP), and adequate monitoring targets (ICR para 70, footnote 45). But the acknowledged poor socio-economic baseline data collection (specifically on ethnic minorities, including 'inadequate assessment of risks and opportunities' – para 65 and see section 9 M&E above) means that while compliance with safeguards was verified, causal attribution of the project's socio-economic impacts – whether positive or negative – was not possible (ICR para78).



b. Fiduciary Compliance

Overall, the ICR concluded that fiduciary compliance was strong. All audits were unqualified and timely (ICR para 87), supervision was strong and minor issues (such as inconsistent contract management by some CPMOs) were identified early and addressed (ICR paras 88-90). Initially slow Bank disbursement (due to unfamiliarity at local level, with Bank processes) was caught up owing to close Bank supervision and capacity building for CPMOs. Initial delays in counterpart funding were also caught up by the time of the MTR (ICR para 94).

c. Unintended impacts (Positive or Negative)

The ICR provides clear evidence for three positive unintended impacts of the project, namely: the project's approach was being adopted and scaled up in other provincial projects and had influenced national forest management guidelines (ICR para 59); the project had reduced the use of burning for forest site preparation, which would therefore support biodiversity, soil and air quality (ICR para 60); and the project's comprehensive community consultation process was widely used and subsequently codified, which standardized this more comprehensive model across counties (ICR para 61).

There are no negative unintended impacts evident in the ICR.

d. Other

Gender

The ICR points to modest evidence of improvements in women's empowerment under the project, citing an increase from 10 to 21 percent of the proportion of women with income equal to men's (para 51). 56 percent of surveyed participants believed the project had increased women's employment opportunities (although no substantial changes were observed in the proportion of women employed) (para 51). It also states that 82 percent of participants surveyed believed 'women's position at home had improved to some extent' under the project' (ICR para 50).

The ICR does not discuss changes in men's employment opportunities or 'position at home'. The project achieved 148 percent of its target for training women in the project's techniques. It is not clear from the ICR or the PAD, on what basis this target was determined, although the PAD does describe active participation of women in the preparation process (PAD p13).

Institutional strengthening

Component II clearly focused on institutional strengthening activities, designed to underpin both PDOs of enhanced resilience and ecosystem/environmental function. The ICR points to met or surpassed output-based targets for increased capacity of nurseries, increased available knowledge through publication of



research, numbers of participants trained and improved facilities for community cooperatives (e.g. ICR paras 39, 40, 42, 52).

The ICR also indicates improved knowledge, skill levels and efficiency of farmers, as a result of the project's research and training (para 41), reported in farmer household interviews and surveys. The extension of the project's approach to other areas, as well as to forthcoming projects is also strong evidence of the effective training, demonstration and research activities.

It is difficult, however, to assess the human or social qualitative improvements in that are important to underpinning long term institutional strengthening (and therefore, the PDOs). This is due to the acknowledged shortcomings in socio-economic data collection and lack of necessary indicators (see section 9 *M&E*).

Poverty Reduction and Shared Prosperity

While the ICR indicates that poverty levels substantially reduced in the project areas during the life of the project, it is also frank in explaining that the project was only one small factor amongst many others, such as strong overall economic growth, government programs and special funding (para 56). Therefore, a level of attribution to the project's effects on poverty reduction is not possible. The project did create jobs directly related to its implementation (ICR para 55) and the ICR points to potential for increased income generation (para 57), including in ethnic minority areas where commercial production plantations were permitted, and broader economic benefits over the long term. But the likelihood of these being realized was not discussed, nor indicated from the project results.

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Highly Satisfactory	Highly Satisfactory	
Bank Performance	Highly Satisfactory	Satisfactory	IEG considers there to be some limited shortcomings in the results framework, bringing Quality at Entry (8a) rating to satisfactory. IEG rates Quality of Supervision (8b) as highly satisfactory. This necessitates an overall rating of satisfactory for section 8.
Quality of M&E	Substantial	Substantial	
Quality of ICR	---	High	

12. Lessons



Lessons directly from ICR:

The depth and quality of extension is critical for the success of a forest project's physical works (para 102). The importance of extension was foreseen during preparation and budgeted for, with recognition by both Bank and PMO staff that the greatest challenge would be changing traditional forestry mindsets and methods. Despite this recognition and preparation, this challenge exceeded expectations and corrective action was required (such as increased training and new extension materials, among other measures, see Section III.B.). Substantial budgeting, early preparation, and use of demonstration forests can help smooth the crucial adoption of required mindsets and technical skills.

Early establishment of demonstration forests can maximize the effective promotion of the project's objectives, intended benefits, and practical techniques (applicable to forest and agriculture projects) (para 102). Demonstration forests, physical demonstration of techniques and results were critical in convincing initially skeptical participants (ICR paras 21, 41, 59, 68). Additionally, the project could draw on earlier plantings that exemplify a project's objective (i.e. repurpose forests and pilot plots established using similar techniques).

Mechanisms to incorporate research activities with other project activities promote knowledge spillovers and help ensure research is relevant (applicable to projects with research components) (para 104). Requiring researchers to take part in extension activities (as in this project) helps researchers produce materials that are timely and relevant to the project (such as operational handbooks) as well as learn from field experience. Similarly, close integration of research activities and monitoring and evaluation (for instance, by having M&E functions undertaken by research units) likely increases the quality of M&E (through research staffs' understanding of experimental design and commitment to rigor).

Geographic information systems (GIS) data would be a valuable addition to forest projects' M&E programs (applicable to forest, environment, and agriculture projects) (para 105). Given that such long-term monitoring is crucial in forest projects (which deliver ecological and landscape benefits over many decades), GIS data of plot locations would allow for the use of publicly accessible satellite imagery for evaluating long-term outcomes such as forest plantation extent, density and possibly diversity, providing a means of third-party verification (in addition to site-inspections) and impact.

Additional lesson from IEG:

Where embedding innovative approaches is central to achieving project objectives, behavior and/or perception-based indicators are needed to firstly, demonstrate their impact on PDO achievement and secondly, make a credible assessment of PDO sustainability. Three of the four lessons in the ICR (above) relate to what the ICR describes as *the* central challenge of the project – embedding the innovative practices (paras 67 and 96) in order for project objectives to be achieved and outcomes to be sustained. Therefore, indicators that capture the central role of behavior and perception changes, can help ensure a) sufficient project resources for training, demonstration and extension activities from the outset (see first three lessons above) and b) stronger data generation in support of demonstrating sustainability of the PDOs.



13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR is exceptionally well written, structured and referenced. Clear, frank language and messaging feature throughout. Terminology and intent of activities are explained clearly and systematically. Attribution of outcomes and/or impacts to the project (or not) is clear. Coverage of the issues is thorough. Minor inconsistencies in figures against component costs and percentages of targets achieved were satisfactorily addressed in the Task Team Leader interview. These were outweighed by its solid reasoning overall, which was consistently supported by presentation of relevant evidence including through the use of footnotes. While the ICR does not identify shortcomings in the RF with respect to indicators of behavior change in support of achieving and sustaining the PDOs, (see sections 8 and 9 above), it captures the issues well in *Lessons* (section 12), offering insightful, practical recommendations, well aligned with the issues identified in the overall analysis.

a. Quality of ICR Rating

High