Completion Report

Project Number: 41461-042
Technical Assistance Number: 8102
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Viet Nam: Promoting Climate Resilient Rural Infrastructure in Northern Mountain Provinces

Asian Development Bank

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<table>
<tr><td colspan="2">TA Number, Country, and Name:
TA 8102-VIE: Promoting Climate Resilient Rural Infrastructure in Northern Mountain Provinces</td><td colspan="2">Amount Approved: $2,000,000
Revised Amount: Not applicable</td></tr>
<tr><td>Executing Agency:
Ministry of Agriculture and Rural Development</td><td>Source of Funding: Global Environment Facility (Special Climate Change Fund)</td><td>Amount Undisbursed:
$246,576.17</td><td>Amount Utilized:
$1,753,423.83</td></tr>
<tr><td colspan="2">TA Approval Date: 29 June 2012
TA Signing Date: 9 October 2012
Fielding of First Consultants: 2 January 2013</td><td colspan="2">TA Completion Date
Original: 31 August 2015 Actual: 31 May 2017

Account Closing Date
Original: 31 August 2015 Actual: 25 August 2017</td></tr>
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Description. The Government of Viet Nam has prioritized developing productive rural infrastructure (PRI) with funding from its own resources, Asian Development Bank (ADB) and other development partners. Viet Nam is one of the most disaster-prone countries, suffering from typhoons, floods, droughts, and landslides, which are expected to worsen with increasing intensification of climatic events. PRI is particularly vulnerable to increased intensities and duration of rainfall causing corresponding increases in the volume and velocity of surface water movement, leading to severe erosion causing PRI damage and high maintenance and rehabilitation costs, as well as the loss of benefits. However, there are a range of engineering options to counter the anticipated impacts of climate change on PRI, ranging from technically sophisticated and expensive civil engineering approaches to far less costly bioengineering approaches that involve the application of basic soil and water conservation techniques for the protection of exposed earth surfaces and structures using live vegetation in concert with simple civil works. The government and ADB recognized the need to highlight the benefits of bioengineering and a capacity development technical assistance (TA) was prepared to (i) demonstrate a range of bioengineering techniques in varying environments and for different kinds of PRI, (ii) familiarize local experts with bioengineering techniques, and (iii) prepare the foundation for mainstreaming these techniques into standard practices. The TA was implemented in conjunction with the ADB-financed Sustainable Rural Infrastructure Project in Northern Mountain Provinces (SRIDP), which was approved on 22 October 2010.

The TA was carried out in parallel to activities under the same umbrella TA project (all financed by the Global Environment Facility/Special Climate Change Fund) implemented by the United Nations Development Programme, which completed four complementary components: (i) mainstreaming of climate risk reduction into policy formulation and infrastructure development planning, (ii) capacity development to increase understanding about current and emerging climate risks and to promote the use of climate resilience techniques during local planning activities, (iii) dissemination of lessons learned and best practices, and (iv) project management.

Expected Impact, Outcome, and Outputs. The expected impact was improved climate resilience of rural infrastructure, and the expected outcome was effective climate-resilience measures mainstreamed into the Ministry of Agriculture and Rural Development (MARD) rural infrastructure program. The outputs were (i) identification of low-cost climate-proofing measures suitable for rural infrastructure in northern Viet Nam; (ii) demonstration of climate change resilient techniques in the provinces of Bac Kan and Son La on two rural roads, one irrigation scheme, and one river embankment;[1] (iii) establishment of a trained cadre of technical personnel familiar with the protection measures; (iv) preparation of recommendations for the integration of the demonstrated approaches into training curricula, standard design procedures, and contract specifications; and (v) identification of climate change risks and vulnerabilities, and the potential for applying the measures used in the demonstrations for strengthening the resilience of nearby communities.

Delivery of Inputs and Conduct of Activities. The TA consultant's performance was rated "*satisfactory*"[2] by both the MARD and ADB. They provided 153.25 person-months against an original allocation of 108 person-months and performed to expected standards. A major change during implementation was that a demonstration site in Son La province was replaced by a site in Thai Nguyen province due to delays in starting up one of the originally identified SRIDP Son La subproject. This spread the demonstrations over three separate provinces making training visits costlier and time consuming. In addition, delays were experienced in developing the demonstration due to (i) delays in the startup and implementation of the SRIDP on which the TA progress was dependent, (ii) inordinately lengthy time for MARD demonstration approvals, and (iii) requirements by MARD technical offices for demonstration design variations which were inconsistent with the purpose of the TA. These resulted in the implementation of some demonstrations at less than favorable times, such as the beginning of the dry season, disruption of site development; and extension of the TA by 21 months. Still, four demonstrations were developed to

[1] Demonstration measures extended along road cut slopes and river banks consisted of techniques involving planting vegetation such as local grasses, palisades, live poles, live fences, fascines, jute netting with grass seed and mulch, vetiver grass, and truncheon cuttings. Hard measures including interceptor and roadside drains, gabion drainage cascades, dry stone pitching and live check dams.

[2] Due to the inordinate MARD approval process time, four consultants needed to be replaced, and the consultant performance could only by assessed near the end of the TA once the demonstrations were completed.

test and show a variety of bioengineering techniques. Regular review missions were undertaken by ADB staff who also attended the various workshops and training sessions. The demonstrations were far less costly than original estimates and the final TA cost was below the approved amount.

Evaluation of Outputs and Achievement of Outcome. The outputs and outcome where achieved through (i) implementing the four demonstrations; (ii) monitoring their development; (iii) designing and running an associated training program; (iv) developing bioengineering guidelines, and (v) assessing the results and benefits. Extra benefits were derived by local people who provided paid labor inputs (47% were women and 65% were from indigenous people's groups) and learned bioengineering techniques, and by local governments who were exposed to the new concepts and techniques. In terms of output indicators in the design and monitoring framework (i) low-cost local resource-based climate-proofing measures suitable for PRI in northern Viet Nam were identified; (ii) four demonstrations of these measures were developed for road and stream environments and remain effective; (iii) training included over 150 government personnel at the national, provincial, district and commune levels, university staff and students, and visiting delegations from other developing member countries of whom about 20% were women (falling short of the 40% DMF target). An effective communication strategy was implemented and focused on a technical core group. Overall, the training program exceeded the 60 provincial staff envisaged in the DMF; (iv) bioengineering design specifications and guidelines reports were submitted to MARD and broadly disseminated to targeted stakeholders with associated training, and (v) community climate hazard and vulnerability assessments were undertaken followed by demonstration effectiveness audits which showed the potential for strengthening the climate resilience of nearby communities. In terms of outcome, subsequent ADB projects have been designed with the requirement to use bioengineering measures as appropriate.[3] The TA has introduced bioengineering as a means of protecting PRI from the consequences of climate change. The key outstanding issue is mainstreaming the approaches into standard practice. Changes in practice generally take a professional generation, so it is premature to expect government to mainstream new practices into design procedures, specifications, standards and cost norms based on four demonstrations. Bioengineering needs to be further exposed through additional demonstrations, testing, and performance monitoring, which would stimulate demand from potential clients such as provincial and district governments, which likely are more open to low cost, and simple technology techniques. For this to happen, there needs to be ownership and promotion of such techniques on the part of established agencies or institutions. The Hanoi University of Transport and Communications has already made use of the TA outputs in engineering instruction and is interested in further bioengineering research. The custodians of relevant procedures, standards, and specification will need to be involved for mainstreaming to be fully achieved.

Overall Assessment and Rating. The TA aligns with relevant government and ADB sector strategies and is rated as *successful*. It is *highly relevant* as it introduces into Viet Nam an effective technology aimed at PRI stabilization, adaptation to climate change and reduction of both construction and maintenance costs. It is *effective* since bioengineering viability has been demonstrated to a range of concerned stakeholders and bioengineering has been included in ADB PRI investment projects. It is *less than efficient* since TA implementation was delayed unnecessarily by internal bureaucratic procedures and inefficiencies. Finally, it is *likely sustainable* as evidenced by the established monitoring system with maintenance carried out at the local level.

Major Lessons. The demonstrations and the technology promoted under the TA have been positively received at all levels. However, bioengineering techniques have yet to be mainstreamed into design procedures, standards and specifications. This will require a sustained and longer process than can be covered in a single TA. Moreover, it will involve the adoption of the promotion and championing of bioengineering as well as further demonstrations and testing by national and local agencies or institutes involved in PRI development. MARD originally identified the Viet Nam Academy for Water Resources' Institute of Water and Environment as the preferred organization for long-term performance monitoring, however their commitment remains unlikely. A major lesson to be learned is that any attempt to bring technological change through a TA needs to have a long-term perspective and needs to work at the level that governs and informs decision making. The two most important targets are universities and the agency departments responsible for design procedures, standards and specifications. At a practical level, demonstrations should be located where they are easily accessible for researchers and visitors.

Recommendations and Follow-Up Actions. In view of the concerns raised about climate change in national strategies, the promotion of low-cost, environmental-friendly technology to counter its potentially negative consequences is a top priority for both the government and ADB. The TA has demonstrated the viability of bioengineering. Since continuity is important, an active effort to identify funding for bioengineering promotion and suitable implementing agencies should be high on the list of potential ADB climate change interventions, either associated with an investment project or a TA.

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[3] Most recently: ADB. 2017. Report and Recommendation of the President to the Board of Directors: *Proposed Loan to the Socialist Republic of Viet Nam for the Basic Infrastructure for Inclusive Growth in the North Central Provinces Sector Project*. Manila.