



CASE STUDY

ON THE

IRRIGATION AND FLOOD PROTECTION REHABILITATION PROJECT
(Loan 1259-VIE[SF])

RED RIVER DELTA WATER RESOURCES SECTOR PROJECT
(Loan 1344-VIE[SF])

RURAL CREDIT PROJECT
(Loan 1457-VIE[SF])

IN THE

SOCIALIST REPUBLIC OF VIET NAM

By Colin Steley

REPORT PREPARED FOR
THE ASIAN DEVELOPMENT BANK
AUGUST 2002

This report was prepared by consultant for the Asian Development Bank (ADB). The findings, interpretations, and conclusions expressed in it do not necessarily represent the views of ADB or those of its member governments. ADB does not guarantee the accuracy of the data included in this report and accepts no responsibility for any consequences of their use.

ABBREVIATIONS

ADB	–	Asian Development Bank
BHH	–	Bac Hung Hai (Irrigation and Drainage System)
BME	–	benefit monitoring and evaluation
COS	–	country operational strategy
CPCF	–	Central People's Credit Fund
CPO	–	Central Project Office (of MARD)
EA	–	executing agency
EIRR	–	economic internal rate of return
FAO	–	Food and Agriculture Organization
IA	–	implementing agencies
IMC	–	Irrigation and Drainage Management Company
IRP	–	Irrigation and Flood Control Rehabilitation Project
MARD	–	Ministry of Agriculture and Rural Development
NNA	–	North Nghe An (Irrigation and Drainage System)
O&M	–	operation and maintenance
PCF	–	People's Credit Fund
PCR	–	project completion report
PEO	–	Postevaluation Office
PS	–	pumping station
RBP	–	Second Red River Basin Water Resources Sector Project
RCP	–	Rural Credit Project
RDP	–	Red River Delta Water Resources Sector Project
RDS	–	rural development support (subcomponent of RBP)
RRP	–	report and recommendation of the President
SBV	–	State Bank of Viet Nam
TA	–	technical assistance
VBARD	–	Viet Nam Bank for Agriculture and Rural Development
VLSS	–	Viet Nam living standards survey

CONTENTS

	Page
I. BACKGROUND	1
A. Country Context	1
B. Country Assistance Strategy	2
C. Irrigated Agriculture	3
D. Project Formulation	5
II. METHODOLOGY	6
III. THE PROJECTS	7
A. Rationale	7
B. Scope and Objectives	7
C. Coordination and Cooperation	10
D. Expected Outputs	11
E. Expected Impacts	12
IV. EVALUATION	12
A. Relevance	12
B. Efficacy	13
C. Efficiency	15
D. Sustainability	18
E. Institutional Development	19
V. ASSESSMENT OF ADB AND THE GOVERNMENT	20
VI. ISSUES, LESSONS, AND FOLLOW-UP ACTIONS	22

I. BACKGROUND

1. This thematic paper on poverty and agriculture in Viet Nam was prepared as part of the Special Evaluation Study of the Asian Development Fund VI and VII (1992–2000). The Irrigation and Flood Protection Rehabilitation Project (IRP) for \$76.5 million was the first Asian Development Bank (ADB) loan to become effective in March 1994, following reunification of Viet Nam. This was followed by effectivity of the Red River Delta Water Resources Sector Project (RDP) for \$66 million in April 1995, and the Rural Credit Project (RCP) for \$50 million in April 1997. The objectives of the IRP and RDP were to prevent key structural failures and increase irrigated agricultural production. IRP was to rehabilitate the Hanoi urban flood protection dike and priority structures in Song Chu and North Nghe An (NNA) irrigation systems. RDP was to improve irrigation and drainage structures in the Red River Delta. RCP was to increase production and diversify agriculture to generate employment.

2. The terms of reference require initial background consideration of both the Government and ADB, sector policies, and priorities, as well as project formulation rationales and processes. An additional section on irrigated agriculture is also included in view of (i) its importance to all three projects, (ii) its particular importance to poverty alleviation through increased rice production, (iii) the dearth of specific subsector policies despite its importance to both the water resources and agricultural sectors, (iv) the general nature of policy prescriptions, and (v) the relative lack of policy influence over Vietnamese change processes (para. 120). Thus, section C on irrigated agriculture considers measures to improve the performance of irrigation systems as well as the potential for increased production and poverty alleviation.

A. Country Context

3. In the early 1980s, centralized economic planning and collectivised agriculture had resulted in hyperinflation, large trade and fiscal deficits, low incomes, and widespread poverty and food shortages. In 1996, the Sixth Party Congress initiated fundamental macroeconomic reforms known as the renovation (*doi moi*) reform program. These were intended to promote a market economy and macroeconomic stability. Many of the renovation reforms focused on the important agriculture sector accounting for 27% of the gross domestic product in 1994. In particular, Resolution No. 10 of 1998 (All-Sided Renovation of Economic Management in Agriculture) and Land Law of 1993 de-collectivised agriculture by recognizing households as the main production unit and granting them extended rights to land use.

4. These reforms had a dramatic impact. From 1992 to 1997, average economic growth was double that of the 1980s. Previously, Viet Nam imported about 1 million tons of rice per annum but became a net exporter in 1989 and is currently the world's second largest exporter. The national incidence of poverty fell by 35% from 1993 (58.1%) to 1998 (37.4%) while rural poverty fell by 32%.¹ In 1998, the incidences of poverty were 44.9% and 9.1% in rural and urban areas, respectively. Thus, despite the role of agriculture in the success of the renovation reforms, poverty remains largely a rural phenomenon.

5. The Government's Socio-Economic Stabilization and Development Strategy to the Year 2000, approved in 1991, involves building on comparative advantages in agriculture, including infrastructure rehabilitation, improved governance, and development of human resources. The Strategy was supported by various sector development plans. However, the Government's

¹ Based on the general poverty line, equivalent to about \$0.33/person/day in 1998, incorporated in the recent *Poverty Reduction Partnership Agreement* between the Government and ADB of February 2002 used throughout.

agricultural development policy letter of November 1994 concentrated on structural reforms, financial intermediation, and land tenure without specific mention of irrigation.²

6. Much of the Government's irrigation infrastructure was built in the 1920s and 1930s. It was badly deteriorated by the early 1990s as the prolonged civil war and severe fiscal deficits had impeded routine maintenance and repair of accumulated typhoon and flood damage. The Government's water resources investment plan was first prepared in 1989 and updated in 1993.³ Emergency rehabilitation and upgrading of infrastructure was considered the immediate priority, because of short gestation periods and high returns envisaged, without provision for complementary measures to improve the performance of irrigated agriculture.

B. Country Assistance Strategy

7. In May 1995, the Postevaluation Office (PEO) of ADB prepared a cross-country Irrigation and Rural Development Sector Synthesis of Postevaluation Findings. The results indicate common crop production shortfalls. In particular, irrigated cropping areas were only 60–85% of appraisal projections. In October 1995, the PEO prepared a Country Synthesis of Postevaluation Findings in Viet Nam. This considered projects affected by the suspension of lending from 1975 to 1978. It also found general shortfalls in both irrigated areas and cropping intensities in the three irrigation and rural development projects evaluated. Yield and production increases were more variable as they were affected by rapid adoption of high yielding rice varieties, collectivisation of agriculture, and declining rice prices.

8. The ADB country operational strategy (COS) of December 1995 was based on the Government's medium-term strategy and the strategic objectives of economic growth with equity. While it did not include specific sector strategies, the COS emphasized poverty alleviation and improved governance involving policy reform, institutional capacity building, human resource development, and environmental and natural resource management as well as the provision of infrastructure. The 1995 Irrigation and Rural development Sector Synthesis reflected these concerns and advocated improved formulation and design, incorporating a flexible process approach, policy and institutional reform, institutional support and capacity building, and increased beneficiary participation in all stages of the project cycle.

9. The 1994 report and recommendation of the President (RRP) for the Agricultural Sector Program identified three sector studies that are reviewed briefly in the 2002 program performance audit report.⁴ This confirmed agriculture was, and remains, both a key sector of the Vietnamese economy and critically important to poverty alleviation given its dominant role as a source of employment. In 1994, 70% of the labour force was employed in agriculture. The 1993 Food and Agriculture Organization (FAO) sector study argued for (i) increased market liberalization to improve competitiveness, (ii) maintenance of agricultural taxation to fund rural infrastructure and three urgent institutional-level policy priorities including price incentives to encourage increased production particularly of rice, and (iii) promotion of farmer organizations for the provision of services.

² ADB. 1994. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Socialist Republic of Viet Nam for the Agricultural Sector Program*. Manila, Appendix 1.

³ The Government of the Socialist Republic of Viet Nam. 1989. *Investment Plan and Development Orientation of the Water Resources Sector*.

⁴ Food and Agriculture Organization (FAO), et al. 1989. *Viet Nam: Agricultural and Food Production Sector Review*; ADB. 1990. *Agriculture Sector Study*. Manila; and FAO. 1993. *Agriculture-led Strategy for the Economic Transformation: Policy and Project Priorities*.

C. Irrigated Agriculture

10. Paras. 3–9 confirm there is a lack of policies specific to irrigated agriculture. Water resources policies tend to emphasize engineering infrastructure while agriculture sector policies generally do not distinguish between irrigated and rainfed agriculture, for example, in the provision of credit. The following discussion considers (i) the importance of irrigated agriculture and potential for increased production and poverty alleviation, and (ii) more comprehensive strategies to improve the performance of irrigation systems.

1. Improvement Potential

11. Irrigation is the major subsector of both the water resources and agriculture sectors. In the early 1980s, irrigation used 92% of water withdrawn and projections indicate it will still account for 75% of water use in 2030. A recent review of public expenditure found irrigation accounted for 61% of the Government's capital, and 15% of its recurrent expenditure in the agricultural sector during the 1997–1998 financial year.⁵

12. Furthermore, rice is the most important irrigated crop. In the early 1990s, rice accounted for 87% of the 2.3 million hectares (ha) irrigated and produced half the gross value of agricultural output. While diversification will remain an important economic objective, it is confined to suitable areas. The combination of typhoons, monsoon climate, and heavy lowland soils will, however, ensure the continued importance of extensive rice cultivation.

13. While the incidence of poverty is higher in the northern and central highlands, there are many more poor people in the Red and Mekong River deltas and central coast where population densities are much higher and rural economies revolve around rice production. Land is reasonably equitably distributed, with little landlessness, but average landholdings are only about a quarter to a third of one hectare/household. Thus, off-farm employment is presently an important source of income to supplement rainfed food crop production.

14. Irrigation allows rainfed farmers to grow a second crop, increase yields, intensify household labour and land use, and achieve a typical three-fold increase in the net value of production. While declining prices benefit consumers, at the expense of producers, World Bank studies, based on the 1993 Viet Nam Living Standards Survey (VLSS), indicate rice production increases contributed significantly to the considerable reduction of rural poverty. The renewed interest in poverty alleviation and growing awareness of the positive impact of irrigated food crop production has now lead to increased research on the subject.⁶

15. ADB contributed to the 1996 multi-donor Water Resources Sector Review.⁷ Of the 4 million ha of cultivated paddy land, the study found 3 million ha was equipped with some kind of irrigation. However, due to incomplete systems, design deficiencies, deterioration of infrastructure, and poor operation, only 2 million ha was irrigated although water supplies were considered adequate to irrigate the full 3 million ha. Despite susceptibility to typhoon and flood damage, both the Water Resources Sector Review and ADB Agricultural Sector Program, also envisaged potential to increase rice yields (70% of those attained in the People's Republic of

⁵ Joint report of the Government and donors. *Managing Public Resources Better: Public Expenditure Review 2000*.

⁶ The World Bank recently commissioned a study of the impact of irrigation on poverty in Viet Nam and Michael Lipton is researching the topic for FAO at the University of Sussex Poverty Research Unit.

⁷ Joint report by the World Bank, ADB, FAO, United Nations Development Programme, and the nongovernment organization Water Resources Group in cooperation with the Institute of Water Resources Planning. May 1996. *Viet Nam Water Resources Sector Review*.

China) since confirmed in the Red River Delta (para. 91). The Ministry of Agriculture and Rural Development (MARD) acknowledges public sector irrigation systems are only producing about 60% of their potential.

16. Thus, there is general consensus that (i) there is considerable scope for improving the performance of existing irrigation systems, and (ii) this offers a much more cost-effective strategy for increasing agricultural production (and alleviating poverty) than investing in new irrigation development. Such improvement has the potential to improve the lives of about 15 to 20 million poor people (1 million ha at 0.25 to 0.33 ha/household) over the 20- to 30-year timeframe estimated to be required for complementary institutional change (para. 119). The key issue, lacking general consensus, is how to improve performance of irrigation systems?

2. Improvement Strategies

17. The 1996 Water Resources Sector Review endorsed the Government's 1993 sector investment plan and proposed extensive rehabilitation and completion of existing irrigation systems as a rapid means of improving their performance. The 1995 ADB sector synthesis had, however, identified, as the main project design deficiency, a common "focus on technical and engineering aspects of irrigation with inadequate attention to the political, institutional, and sociocultural environment of the development member countries". This engineering bias is reflected in both (i) the continuing Vietnamese practice of referring to irrigation infrastructure as "hydraulic works," and (ii) proposals for rehabilitation and completion of existing irrigation systems as the main or even sole means of improving their performance.

18. The corollary of engineering bias in the water resources sector is the common lack of specific attention to irrigation in the agricultural sector despite its importance to both production and poverty alleviation. The recent reorganization of ADB and merger of the Ministry of Water Resources, extant during preparation of IRP and RDP, with the present MARD now provide a better opportunity to pursue an integrated cross-sectoral approach to improve the performance of irrigated agriculture.

19. While the immediate need to restore some priority structures in some systems is not in doubt recent international experience indicates deteriorated infrastructure is more often a symptom rather than a cause of poor performance. Furthermore, irrigation management (irrigated areas and cropping intensities), agriculture (crop yields), and their interaction (coordinated cropping patterns, cultural practices, and water delivery schedules) are usually important constraints. Most systems are different and a simple generic improvement strategy, such as rehabilitation and completion of infrastructure, is unlikely to prove very effective. Unfortunately, there are few, if any, suitable system assessments and diagnoses to identify constraints and formulate effective interventions to improve performance.

20. While the above general lessons have identified the "ingredients," there is still a need to develop a holistic "recipe" for the improvement of irrigated agriculture using participatory processes and appropriate improvement strategies. These need to be based on performance assessments and diagnoses of individual systems using participatory processes yet to be fully developed. Effective improvement strategies will involve synergistic combinations of complementary interventions in agricultural development (including the provision of credit), irrigation management and phased rehabilitation or improvement of priority infrastructure. Suitable participatory processes are also yet to be fully developed and integrated.

21. Future policy dialogue and country assistance strategies should emphasize the considerable potential to increase agricultural production and alleviate poverty by cost effective improvement of irrigation performance. ADB policies on governance, participation, etc., would then follow as pragmatic means to achieve this attractive objective. Participation, for example, is a proven means of rationalizing irrigation investments to improve performance. International experience, however, indicates it is most effective when beneficiaries are responsible for decision making and also make real equity contributions to the costs of construction. Another example requires reconciliation of incompatible ADB policies on (i) cost recovery to fund agency operation and maintenance (O&M), and (ii) farmer participation and transfer. This raises fundamental irrigation system performance incentives and governance issues.

D. Project Formulation

22. The three agricultural projects, evaluated herein, were among the first projects formulated during introduction of the renovation reforms following the prolonged civil war, reunification, and subsequent period of centralized planning and collectivised agriculture.

23. The IRP was the first such ADB-financed project to become effective in any sector. ADB staff formulated the RDP and IRP over periods of about 6 and 2 years, respectively, without preparatory technical assistance in either case.⁸ The RRP's indicate formulation of both projects was based primarily on the Government's Water Resources Investment Plan (para. 6). This emphasizes rehabilitation or upgrading of priority irrigation, drainage, and flood protection infrastructure. However, the two designs do not appear to have been informed by the contemporaneous agricultural sector studies referred to in the 1994 RRP for the Agricultural Sector Program (para. 9). This is further evidence of the present engineering bias in irrigated agriculture (para. 17). The prolonged formulation of the RDP appears to have been due primarily to the Government's lack of familiarity with ADB's sector lending modality and core subproject preparation requirements. Thus, two re-appraisal missions were required to review the scope, economic viability, environmental and social implications, and design and implementation capacities.

24. The Institute of Social Sciences conducted social assessments of IRP and RDP in March and November/December 1993, respectively. RRP appendixes summarize results. Both assessed demand for project interventions (both high) and present the agroeconomic data required to assess economic impact disaggregated by target groups comprising (i) households suffering common inundation and/or drought problems to be alleviated by RDP core subproject structures, and (ii) IRP farmers enjoying different levels of irrigation service—fully irrigated, partly irrigated, and rainfed. Hanoi dyke beneficiaries, with highly diverse socioeconomic characteristics (and much lower incidence of poverty), were not included. The social assessments identified credit as an important production constraint and found 86% of direct RDP beneficiaries were poor. This supported the secondary poverty reduction classification and might have been used to justify a primary classification.

25. Social assessments were conducted before the 1993 issuance of ADB's *Guidelines for Incorporating Social Dimensions in Projects* requiring stakeholder participation in project formulation. Formulation of the two projects does not appear to have involved stakeholder workshops or beneficiary (primary stakeholder) participation in either problem analysis or

⁸ The RDP was identified during the agricultural sector reconnaissance mission of March 1989. This was followed by appraisal in December 1990 and reappraisal in September and December 1993. The IRP was identified during the water resources sector reconnaissance mission of September 1991. This was followed by appraisal in February–March 1993 assuming lending operations would resume that year.

logframe development, etc. Furthermore, the large numbers of farmers, typically involved in irrigation improvement (most landholdings are less than 0.33 ha) requires the participation of target groups with different interests in project interventions and outcomes. While target groups were identified in both projects, the RDP design does not address their specific needs. There is also little point in assessing demand for fully subsidized interventions.

26. The RCP was formulated over about 2 years on the basis of a project preparatory TA.⁹ Social assessment comprised a questionnaire survey to assess demand for financial services without differentiating target groups: for example, poor IRP and RDP irrigation farmers: 84% of households surveyed borrowed an average of nearly \$100 each for livestock breeding (70%), rice and plant cultivation (48%), and consumption and emergencies (36%). There was a high level of demand expressed for credit but much less for savings facilities.

27. The social assessment did not provide an explicit distributional analysis but the incidence of poverty amongst the rural population, 66% at the time of the 1993 VLSS, provides an implicit justification for the secondary poverty reduction classification. Stakeholder workshops involved government and donor representatives but not potential borrowers who apparently did not participate directly in formulation of the RCP.

II. METHODOLOGY

28. The evaluation presented herein is the product of three inputs, by the poverty and agriculture thematic specialist, totalling 2 months from 2 April to 31 July 2002. The first compiled the background information and made arrangements for the participation of relevant executing agencies (EAs) and implementing agencies (IAs). The second input involved field trips and focus group meetings with RDP and RCP beneficiaries in Ha Tay Province in the Red River Delta. Time limitations prevented use of detailed sampling surveys and questionnaires. The thematic paper was then completed on the basis of ADB comments on several previous draft versions.

29. The terms of reference required use of a modified version of the September 2000 project performance audit report methodology, based on the project logframes (not mandatory but available for RDP and RCP) and the periodic project performance report as key parts of the project performance management system. The evaluation was also based on the analysis and interpretation of the project preparation and implementation documentation, referenced herein, and the available benefit and monitoring data.¹⁰

30. The main limitation of the evaluation is that all three projects are yet to close. Project completion reports (PCRs) were underway for RDP and planned for IRP during the finalization of this report. This limits the evaluation especially of project impacts and sustainability, etc. The Asian financial crises of the late 1990s did not impact on Viet Nam as severely as other countries in the region. However, the challenge of separating project impacts from those of the concurrent macroeconomic renovation reforms is only partially tractable. Furthermore, the available data did not facilitate distributional analysis and poverty impact assessment.

⁹ TA 2286-VIE: *Rural Finance*, for \$586,000, approved on 12 January 1995, followed by appraisal in June 1996.

¹⁰ Institute of Water Resources Research. 2000 and 2001 RDP Benefit Monitoring and Evaluation (BME) reports; Experco, et al. 2001 IRP *Final BME review report*; and Hanoi National Economics University. *2000 Socioeconomic Assessment of RCP*.

III. THE PROJECTS

A. Rationale

31. The Government faced a multitude of challenges in the early 1990s as it introduced macroeconomic reforms following prolonged civil war and centralized economic planning. Key water resources infrastructure was badly deteriorated for lack of maintenance and repair of accumulated typhoon and flood damage. Among numerous infrastructure repair requirements, the Government gave highest priority to repairing the dike protecting the city of Hanoi from flooding. This was badly deteriorated and considered a very high risk of failure.

32. Collectivised agriculture had stagnated and the renovation reforms unleashed a high level of demand for improved agricultural technology and credit to increase production. Irrigated agriculture was also a priority in view of its importance to employment generation and poverty alleviation. Key irrigation and drainage structures were badly deteriorated in both the Red River Delta and northern central region where monsoon flooding and waterlogging followed by dry season drought and saline intrusion constrain agricultural production. The priorities were drainage (Red River Delta), prevention of the disasters associated with structural failure (central region), and increased water availability.

33. Thus, ADB and the Government agreed the three loans to protect the capital city of Hanoi from flooding and increase irrigated agricultural production primarily through provision of water resources infrastructure (irrigation, drainage, and flood protection) and rural credit.

B. Scope and Objectives

34. The primary classification of all three projects was economic growth. IRP did not have a secondary objective nor did its RRP include a logical framework. The secondary classification, of both RDP and RCP, was poverty alleviation. While it is positive that both these projects included logframes, as its use did not become mandatory until 1999, neither logframe included specific poverty objectives or verifiable poverty reduction performance targets. The value of increased agricultural production provided economic justification for all three investments. The scope and objectives of the three projects are described below.

1. Irrigation and Flood Protection Rehabilitation Project (IRP)

35. The stated objectives of the IRP were to (i) urgently rehabilitate the Hanoi Flood Protection Dike and (priority structures in the) Song Chu and NNA irrigation systems, thereby preventing the economic and social disaster resulting from possible failure of such facilities, and (ii) promoting and sustaining further agricultural production and economic development to improve living conditions and the quality of life. This was to be achieved through the implementation of four parts (components) involving the three infrastructure rehabilitation subprojects and provision of support facilities and consulting services.

36. Based on geotechnical information and past records, nine Hanoi dike locations were identified as serious risks of failure: four associated with river bank erosion and five with weak and permeable foundations. Once in 5 years, there was thought to be a 20% probability of failure rising to 80% once in 59 years. Works to improve long-term stability involved embankment protection structures to control riverbank erosion, and foundation improvement and embankment strengthening to control seepage and reduce the risk of piping (erosion

channel) failures. It is worth noting the proposal did not involve either increased overtopping protection or height raising to increase the level of flood protection. Thus, it was a straightforward engineering component with few adverse social implications.

37. Song Chu, built in 1926, is the largest irrigation system in the Ma River Basin. Flooding, in 1962 and 1980, severely damaged the diversion weir on the Chu River and significantly reduced the amount of water that could be diverted. The areas irrigated in the wet and dry seasons had been reduced to 30,000 ha and 23,000 ha, respectively. These represent only about 71% and 64% of the design coverage. The diversion weir and its intake structure were also considered to be at significant risk of failure. Once in 5–10 years, the probability of failure was thought to be 10–20% rising to 40–50% in the event of a recurrence of the floods that damaged the structures in 1962 and 1980.

38. NNA, built in 1936, is the largest irrigation system in the Ca River Basin. It continued to support two paddy crops a year, with a cropping intensity of about 190%, but was seriously deteriorated with only 15,000 ha provided with water in the wet season representing 60% of the design coverage. The main canal tunnel was also thought to be at 10–20% risk of failure, over 3 years, and more than 90% within 10 years. The IRP was to construct a new main canal tunnel to ensure continuity of service.

39. In both Song Chu and NNA, the project was also to rehabilitate the main hydraulic control structures, including headworks, intakes and major regulators and resection and partially line main and secondary canals to both ensure long-term structural safety and improve irrigation efficiency to allow increased agricultural production. The total cost of IRP was estimated at \$95.6 million of which \$52.1 million (54%) was the direct cost of civil works—for Hanoi dike \$30.7 million (59%), Song Chu \$14.5 million (28%), and NNA \$6.9 million (13%). Thus, the unit costs of repairing priority irrigation structures are only \$250 and \$300/ha. This compares favourably with the cost of new development typically ten times this amount.

40. The IRP loan also financed 94 person-months of consulting services to support implementation involving (i) project management including construction supervision, (ii) subproject design, and (iii) procurement (tendering). The subproject design activity also included baseline surveys and performance assessments and diagnoses of the two irrigation systems. The consultants were also subsequently entrusted with benefit monitoring and evaluation (BME) surveys to assess subproject impacts.¹¹ The complementary, grant-financed, advisory TA for (irrigation) O&M strengthening (57 person-months) was to involve (i) O&M policy review, (ii) staff training, and (iii) pilot O&M strengthening.

2. Red River Delta Water Resources Sector Project (RDP)

41. The logframe goals of the RDP were to increase foreign exchange earnings and incomes of smallholder farmers in the Red River Delta. These were to be achieved through attainment of the immediate purpose to create a sustainable increase in food crop production from smallholder farms in the Red River Delta (by improved water control and delivery). This was to be achieved through the implementation of three components: infrastructure, BME, and human resource development.

42. The sector approach was adopted as the Government had: (i) a well-articulated sector plan, (ii) demonstrated capacity to implement small to medium-scale (infrastructure) projects,

¹¹ Experco, et al. 2001. IRP *Final BME Review Report*.

and (iii) well-established sector cost-recovery mechanisms.¹² The infrastructure component was to upgrade or rehabilitate 20–30 subprojects (structures) costing up to \$3 million each of which four core subprojects were fully appraised during project preparation. The non-core subprojects were to be prepared during implementation to meet specified appraisal criteria.

43. The Red River Delta is the most densely populated area of Viet Nam with a rural population of about 16 million. The Delta was formed by alluvial sediment deposition at the confluence of the major Da, Thai Binh, and Red Rivers.¹³ More than half the Delta is less than 2 meters (m) above sea level and would be flooded regularly if not for extensive river and sea dikes forming 33 polders irrigating 783,000 ha and draining 674,000 ha.

44. The 6-month wet season starts in May, plateaus in June and July, and peaks in August before finishing in October. The 3-month dry season lasts from December to February. Monsoon flooding and waterlogging affect the (i) yields of both the initial spring crop (January–June) and subsequent summer crop, and (ii) feasibility of growing a third irrigated crop in the winter dry season. Thus, drainage is often the limiting production constraint and an essential prerequisite of irrigated agriculture. The term irrigation system, used herein, includes associated drainage and flood protection.

45. The large Bac Hung Hai (BHH) is a typical polder system draining 185,600 ha and irrigating 126,600 ha. Natural rivers are used for both gravity distribution of irrigation water, from the northwest intake sluice, and conveyance of drainage to three southeast outfall sluices. The BHH Irrigation Management Company is responsible for the gravity system including 12 regulators. The present intake capacity is limited to about 0.5 litres per second (lps) per ha and extensive pumping supplements both irrigation and drainage.

46. The BHH system also involves 28 major peripheral stations pumping water between the polder system and surrounding rivers. There are six irrigation stations (15.5 cubic metres per second [cumec] for 8,508 ha at 1.82 lps/ha), 15 drainage stations (177 cumec for 37,516 ha at 4.73 lps/ha), and seven dual-purpose stations (17.5 cumec draining 4,671 ha at 3.75 lps/ha and irrigating 2,915 ha). In addition, there are 276 internal irrigation, drainage, and dual-purpose pumping stations recirculating water within the polder system. Pumping stations are operated by 12 district irrigation and drainage enterprises.

47. The RDP loan was to finance 26 person-months of consulting services to support the first 18 months of implementation including (i) establishment of subproject preparation guidelines to meet ADB environmental and social assessment requirements; (ii) project management, including procurement, construction, supervision, etc; and (iii) establishment of the BME system. The complementary, grant-financed advisory TA for water resources sector capacity building (33 person-months) was to involve (i) modern approaches to planning and design, (ii) environmental assessment and monitoring, (iii) research into gender issues, and (iv) system O&M performance including a diagnostic study of BHH irrigation system. While RDP is a more complex sector project, compared with IRP, it was endowed with less than half the implementation and TA consulting services enjoyed by the IRP.

¹² ADB. 2002. Draft Project Completion Report of the Red River Delta Water Resources Sector Project in Viet Nam. Manila.

¹³ Administratively, the Red River Delta now encompasses nine provinces: Ha Noi, Hai Phong, Ha Tay, Hai Duong, Hung Yen, Nam Dinh, Ha Nam, Thai Binh, and Ninh Binh (there have been some administrative name changes since the RRP in 1994). Geographically, the Delta also includes Quang Ninh Province.

3. The Rural Credit Project (RCP)

48. The RCP addressed acute supply constraints to meet general demand for credit unleashed by the renovation reforms. The logframe goals of RCP were to promote rural economic growth, diversification of the rural economy, and reduction of rural poverty. These goals were to be achieved through attainment of the immediate purposes of improved rural incomes, expanded productive employment, and a strengthened rural financial system.

49. The RCP was to be implemented throughout rural Viet Nam and involve subproject investments, strengthening of financial institutions, and project management components. Subproject investments involved the provision of separate credit lines to the Viet Nam Bank for Agriculture and Rural Development (VBARD) and Central People's Credit Fund (CPCF) for onlending to People's Credit Funds (PCFs). The PCFs are legally constituted, commune-level, autonomous, small-scale financial institutions based on voluntary membership.

50. VBARD was to receive a credit line for \$32 million to support medium-term subloans of up to \$5,000 with a maturity of 1–5 years. These were mainly to promote (i) small-scale agroprocessing, and (ii) agricultural diversification to promote a move away from “over dependence” on rice cultivation to horticulture, animal husbandry, and industrial crops. Agricultural diversification was promoted despite limited (i) land suitability (para. 12), and (ii) potential to generate employment and reduce poverty compared with irrigated rice.

51. In view of their shorter operational history and lack of relevant experience, CPCF was to receive only \$ 4.8 million for financing short-term subloans of up to \$500 with a maturity of up to 1 year. Only \$2 million (4.3% of credit lines) of this was specifically allocated to support lending to poor PCF members. These targeted loans were, however, restricted to a maximum of \$100, as no collateral was required, and were the only intervention specifically designed to achieve the secondary poverty reduction classification and goal.

52. The ADB TA 1961 for *Development of Small Scale Rural Credit* had assisted VBARD to develop its credit appraisal capacity. VBARD had also gained medium-term lending experience under the IDA-financed Agricultural Rehabilitation Project. Thus, the RCP loan provided only 12 person-months of consulting services for training of VBARD credit appraisal trainers.

C. Coordination and Cooperation

53. The Ministry of Water Resources, since incorporated into MARD, was the EA for both IRP and RDP. MARD established the Hanoi Central Project Office (CPO) and subproject management offices specifically for implementation of IRP. The CPO was responsible for planning, budgeting, contracting, accounting, and progress reporting. Engineering site investigations, surveys, and detailed designs were to be provided by MARD's (now) Hydraulic Engineering Company No. 1 and Institute of Water Resources Research.

54. The above IRP arrangements were considered fully adequate. An additional project manager and support staff were appointed to enable the CPO to manage implementation of RDP as well as IRP. The CPO's IRP responsibilities were expanded under RDP to include approval of subproject appraisal reports and designs and BME. Six existing MARD construction management boards were reconstituted as subproject management offices responsible for subproject implementation including preparation of subproject appraisal reports and supervision of investigation, design, and construction.

55. Provincial Departments of Agriculture and Rural Development were to propose non-core RDP subprojects and prepare detailed appraisal reports for CPO approval. Initial environmental examinations and social assessments, using ADB guidelines, were to be prepared for each subproject and included in appraisal reports for ADB approval.

56. For economy and efficiency reasons, the State Bank of Viet Nam (SBV) was the EA for RCP through its (now) International Credit Project Management Unit formed in 1995 to manage the IDA-funded Bank Modernization and Rural Finance projects. The Unit was responsible for overall implementation, accrediting participating PCFs, preparing operating guidelines, reviewing subloan applications, disbursement to VBARD and CPCF, BME, institutional strengthening, accounting, progress reporting, and liaison with ADB.

57. VBARD and CPCF were the IAs for the RCP, through establishment of project implementing units, responsible for programming, budgeting, accounting, loan refinancing, monitoring performance of participating district and commune-level organizations, progress reporting, etc. In addition, CPCF was responsible for accrediting PCFs, according to specified financial criteria, and subsequent supervision of their operations including administration of the targeted fund for poor PCF members. Loan proceeds were to be allocated amongst eligible PCFs on a first-come-first-served basis.

58. In view of its national scope, an RCP donor coordination framework was agreed with the World Bank and CIDA to improve effectiveness of external assistance and ensure a uniform approach to development of the rural financial system. This covered (i) institutional development of VBARD, (ii) settlement of VBARD's frozen debts, (iii) level and structure of rural interest rates, (iv) deposit mobilization, (v) the Viet Nam Bank for the Poor, offering subsidized credit, and (vi) coordinated implementation of rural finance and credit projects.

D. Expected Outputs

59. Completed infrastructure subprojects were intended to be the main outputs of both IRP and RDP. For IRP, this involved the emergency repair of the Hanoi Flood Protection Dike and diversion weir (Song Chu), main canal tunnel (NNA), and other priority regulating structures in both irrigation systems. RDP was to rehabilitate or replace 20–30 irrigation and drainage structures, serving an average area of 4,000 ha, to be operational by 2000.

60. Support components were also to produce complementary outputs. For IRP, these included (i) assessment reports of the Song Chu and NNA irrigation systems, presenting the results of the both the baseline survey and performance assessment and diagnosis, and (ii) an O&M policy review report, and programs and completion reports for training and O&M strengthening. For RDP, the logframe BME component outputs were (i) a water quality testing program, (ii) BME system, (iii) research study on gender issues, and (iv) the diagnostic study of the BHH irrigation system. HRD component outputs were (i) review of non-core subproject preparation procedures, and (ii) appropriate training.

61. Different consultants were, however, responsible for the complementary outputs of both projects, for example, IRP irrigation system assessment and O&M strengthening. Furthermore, it is not clear, in either case, how the various complementary irrigation management activities (neither project included agricultural activities) were to contribute to achieving the increased agricultural production purposes of both projects (para. 63).

62. The logframe outputs of the main RCP subproject investments component are the increases in VBARD and CPCF financial resources provided under the loan. The RRP indicates that about 102,000 rural households, including 25,000 poor members of PCFs, were intended to benefit directly from loans under the project. The outputs of the components for strengthening of the financial system and project management included training.

E. Expected Impacts

63. The IRP was intended to (i) prevent disastrous failure of Hanoi Flood Protection Dike, and (ii) prevent reductions, due to structural failures, and increase agricultural production of rice (73,000 tons [t]) and other food crops mainly sweet potato (44,000 t) by the reliable supply of water to fully irrigate 76,000 ha. The logframe purpose of RDP was to create a sustainable increase in food crop production. The associated quantitative production targets were to increase average rice production by (i) 0.3 t/ha and 100,000 tons rice equivalent, (ii) achieve an economic internal rate of return (EIRR) of at least 15% over 25 years, and (iii) collect additional water fees sufficient to finance incremental O&M costs.

64. The logframe purposes of the RCP were to improve rural incomes and employment and strengthen rural financial systems. The qualitative targets were to (i) improve access to formal credit, (ii) diversify economic activities, (iii) raise agricultural productivity and incomes, and (iv) increase the number of participating PCFs to 1,000. The RRP indicates RCP loans, mainly for diversification, were intended to reduce acute rural underemployment by generating about 63,000 person-years of productive employment.

IV. EVALUATION

A. Relevance

65. The IRP and RDP were both highly relevant to the Government's 1993 Water Resources Investment Plan. This emphasized emergency rehabilitation of priority infrastructure that had deteriorated during the prolonged civil war and period of centralized planning prior to introduction of the renovation reforms in the early 1990s. The RCP addressed acute supply constraints to meet the general demand for credit unleashed by the renovation reforms. The three projects were, however, only partly relevant to both the Government's 1991 Socio-Economic Development Strategy and the 1995 ADB COS with their common emphasis on growth with equity and the important agricultural sector.

66. Firstly, the provision of infrastructure is clearly a necessary, but insufficient condition, to realize the demonstrated potential to improve the performance of irrigated agriculture. The focus on infrastructure also perpetrates an engineering bias identified as the main deficiency in the design of irrigation and rural development projects by the 1995 sector synthesis. Effective strategies, to improve the performance of irrigated agriculture, will also involve synergistic interventions in agricultural development (including credit), and irrigation management as well as the phased rehabilitation or improvement of priority infrastructure.

67. Secondly, the growth with equity focus has now sharpened with the 1999 adoption of poverty alleviation as ADB's overarching objective. The 2000 evaluation of ADB poverty reduction effectiveness found the lack of specific poverty reduction objectives and explicitly targeted interventions to be a common weakness of many projects.¹⁴ Poverty is closely

¹⁴ ADB. 2000. *Effectiveness of ADB Approaches and Assistance to Poverty Reduction*. Manila.

associated with rice cultivation and irrigated agriculture remains an important source of employment, income generation, and poverty alleviation in Viet Nam. Despite their two secondary poverty classifications, and high incidences of poverty in beneficiary populations, the project designs are only partly relevant. RCP does not target poor rice producers and less than 5% of credit lines are specifically targeted to support lending to poor PCF members. RDP is only indirectly targeted at poorer households suffering water shortages, flooding, and waterlogging. IRP did not address the specific needs of similar target groups.

68. Finally, while the provision of infrastructure is a “passive” irrigation intervention, with limited benefits, improved governance and beneficiary (primary stakeholder) participation are essential ingredients of an effective “active” learning process strategy for improving irrigation performance, increasing agricultural production, and reducing poverty. However, there was little beneficiary participation in the formulation of the three projects. Institutional capacity building was only partly relevant as it was limited to strengthening infrastructure implementation capabilities and VBARD. Beneficiary participation in project implementation was irrelevant as the limited outputs expected were not logically linked to project impacts.

69. The IRP Hanoi Dike, a straightforward infrastructure component without secondary poverty classification or impact, is relevant. The IRP irrigation components and RDP suffer the above three constraints and are only partly relevant. The intermediate RCP is relevant.

B. Efficacy

70. IRP was intended to prevent disastrous failure of Hanoi Flood Protection Dike. This has been achieved as there have been no failures to date. Thus, the straightforward, pure engineering, IRP component to rehabilitate Hanoi Dike Component was highly efficacious. The IRP irrigation components were to prevent reductions and increase agricultural production of food crops, mainly rice, by the reliable supply of water to fully irrigate 76,000 ha. There have been no structural failures but appraisal EIRRs confirm the relative importance of production increases as excluding probable reductions (failure losses) only reduced the EIRRs from 16% to 14% (Song Chu) and from 26% to 22% (NNA).

71. IRP production increases were attributed exclusively to introduction of full irrigation to previously rainfed or partially-irrigated areas. Irrigated crop yields were not assumed to have increased as a result of IRP. Thus, the efficacy of IRP irrigation components can be assessed in terms of the areas fully irrigated. The BME for IRP indicates 41,502 ha were fully irrigated in 1995 and this had increased to 53,216 ha in 2000. Thus, at this early stage, just 34% of the expected increase to 76,000 ha had been achieved. Rehabilitation of priority infrastructure has proved insufficient to achieve the potential increase in agricultural production and the IRP irrigation components Song Chu and NNA were less efficacious.

72. The evaluation of RDP efficacy is based on interpretation of the economic analysis prepared concurrently as part of the PCR. This recognized that there had been impressive agricultural gains, particularly in rice yields, in areas without RDP subprojects. In the old provinces of Vinh Phu, Ha Bac, Hai Hung, and Thai Binh average spring and summer rice yields increased by 0.5 and 1.0 t/ha (3.4% and 6.1% per annum) from 1996 to 2001. Cropped areas also increased slightly by 0.5% and 0.6% per annum, respectively. The PCR analysis sought to separate these external effects by comparing present production in “with” subproject benefiting areas with adjacent control areas, with similar flooding/waterlogging constraints (drainage) or water shortages (irrigation), but “without” subprojects. Good general agreement was found

between benefiting and selected control areas and district boundaries for which 2001 production data was obtained from the Government Statistics Office.

73. Based on present production trends, all four subprojects are expected to result in 2002 incremental rice production of at least 0.3 t/ha compared with the “without” subproject control areas. Thus, while delayed, the first of the logframe targets will be achieved. CPO data indicates the 30 RDP subprojects serve 588,823 ha. Thus, the second 100,000-ton incremental rice production target will be exceeded by at least 75%. RDP will also benefit at least 50% more than the 1.5 million people originally envisaged. However, the first two targets are not consistent with the third requiring larger production increases (e.g., yield > 0.3 t/ha) to achieve a minimum EIRR of 15%. This was not achieved as the PCR reevaluated EIRR is only 10.3%. Nor will the fourth full O&M cost recovery target be achieved given the good sector O&M performance despite ubiquitous subsidies.

74. PCR reevaluated subproject EIRRs (appraisal values in parenthesis) were Trieu Dong Drainage Pumping Station (PS) 5.3% (20.6%), Phan Dong Drainage PS 3.7% (21.9%), three South Thai Binh subprojects, including Lan Sluices, 10.8% (21.0%), and Thanh Diem Irrigation PS 19.2% (21.5%). All core subprojects failed to meet appraisal expectations for incremental rice yields over control areas. The Phan Dong Drainage PS also failed to meet incremental area expectations. Winter vegetables have been contracting consistently throughout the delta whereas appraisal envisaged expansion of area providing significant value added by the Trieu Dong Drainage PS and the South Thai Binh subprojects. For South Thai Binh, however, shortfalls in rice areas and winter vegetables were partly offset by an unanticipated increase in the area of summer rice. For the Thanh Diem Irrigation PS, shortfalls in rice yields were offset by area expansion.

75. Therefore, the Thanh Diem Irrigation PS performed up to appraisal expectations, the South Thai Ninh combined irrigation and drainage subprojects were intermediate, and the two drainage PS subprojects performed particularly poorly. CPO data indicates 10 of the 30 subprojects were for irrigation, 9 for drainage, and 11 combined irrigation and drainage. However, drainage is estimated to account for nearly 60% of the total investment after accounting for the higher duty. This mix is reflected in a lower reevaluated overall EIRR of 10.3% compared with 21% at appraisal. Thus, irrigation subprojects were highly efficacious, drainage subprojects less efficacious and, overall, the RDP was efficacious.

76. Of 61 provinces, VBARD and CPCF were operative in 37 and 48, respectively. However, CPCF does not cover Lai Chau (poorest) and Cao Bang (4th poorest), and neither covers Lao Cai, Lang Son, and Bac Kan provinces (5th to 7th poorest). The poor took 30% of nontargeted PCF subloans for similar amounts to nonpoor (average \$400 vs \$480/subloan). VBARD advised they do not record borrower status. The incidences of rural poverty were about 66% and 45% in 1993 and 1998, respectively. Thus, while the first qualitative target of increased access to rural credit was achieved, the poor did not enjoy equal access. Thus, there is considerable potential to improve social inclusion by explicit poverty targeting through both more focused PCF coverage and improved loan access by the poor.

77. For this evaluation, both VBARD and CPCF produced summaries of subloan portfolios at 31 December 2001. These are considerably larger than those reported by the ADB review mission of 11–21 December 2002. For example, CPCF reported four times the number and amount of subloans: 181,903 subloans for about \$100 million compared with only 45,683 subloans for \$22.5 million reported by the ADB review mission. This may reflect either updating of subloan portfolio data, following the review mission, or fungibility of the credit lines

available to CPCF. The compositions of subloan portfolios are, however, similar. Thus, the present evaluation is based on the more conservative ADB review mission data.

78. Evaluation is further complicated by the lack of relevant detail available in the RRP. This presents budgets for 16 typical loan enterprises including financial internal rates of return or returns to labour as appropriate. However, it does not present the assumed loan portfolio (mix of enterprises) as a basis for the estimate that RCP would generate 63,000 person-years of employment. The December 2002 ADB review mission noted that appraisal assumed one half of VBARD disbursements would be for agroprocessing and service activities. However, only 1% and 9% of VBARD lending was for agroprocessing and services, respectively. The only service enterprise envisaged at appraisal was for irrigation water pumping. Thus, the RCP clearly did not achieve its second target of diversifying rural economic activities.

79. Appraisal found agroprocessing enterprises all offered better apparent returns than the crop production enterprises favoured by borrowers. Agroprocessing and services also generated more employment (range 651 to 14,547 days/\$1,000 borrowed) compared with other enterprises envisaged (range 219 to 574 days/\$1,000 borrowed). While reevaluation found the combined VBARD and CPCF portfolios generated about 220,000 person-years of employment (versus only 63,000 person-years at appraisal) this was less than 60% of the 380,000 person-years generated by the approximate appraisal enterprise mix. Nevertheless, the third logframe goal of raising agricultural productivity and incomes (and generating employment) was substantially met with reservations regarding its efficiency (para. 93).

80. The 1999 SBV evaluation found the pilot PCF network to be financially sustainable and appropriate to low-income borrowers needs. However, SBV temporarily suspended the issue of new PCF licences, to focus on capacity building of existing PCFs, and is yet to authorize expansion that should concentrate on the poorest administrative areas. Thus, the fourth PCF expansion target was not achieved. Therefore, of four qualitative logframe targets, two were substantially met with qualifications. The intended diversification of rural enterprises and PCF network expansion did not eventuate and RCP was only efficacious.

C. Efficiency

81. The IRP was sensitive to the risk of Hanoi Dike failure and implementation delays followed by cost overruns and decreased benefits. The IRP implementation was delayed by a minimum of 2.5 years representing 150% of the original period. On the other hand, significant cost savings were achieved, within the original budget, by adding two flood relief subprojects and increasing the Hanoi Dike scope of work by 40%.

82. The Hanoi Dike component of IRP involved cost-effective structural rehabilitation to reduce serious risks of riverbank erosion and piping failures of both the flood protection dike and its foundations. It did not involve raising the dike to increase the level of protection against overtopping. Thus, an appropriate engineering design and construction process was employed. This involved professional judgement of the risks and economic consequences of failure and provided the basis for appraisal estimates of economic efficiency (EIRR = 50%). However, there is no sound basis to reevaluate risks of failure and economic benefits (losses avoided) in retrospect and no reason to doubt Hanoi Dike was highly efficient.

83. The IRP irrigation components (Song Chu and NNA) were mainly intended to increase agricultural production. Both appraisal benefits and economic efficiency were adversely affected by the decline in the price of rice (by about 10%) but particularly by the failure to attain the full-

irrigation target of 76,000 ha. This shortfall was, however, accompanied by unanticipated increases in rice yields and areas. Thus, the forthcoming PCR should adopt the recent RDP approach to economic reevaluation. This compared district production data in “with” subproject areas and “without” subproject control areas to disaggregate legitimate IRP impacts from external agricultural growth effects. The overall impact of improved IRP irrigation was to increase agricultural production by about 50% of the appraisal target in each of the subprojects. All else being equal, this would reduce appraisal EIRRs from 15.9% to 8.0% for Song Chu, and 25.9% to 14.0% for the NNA irrigation system.

84. The main outputs of TA 1968 for O&M pilot strengthening were restructuring of irrigation management companies, along hydraulic boundaries, and introduction of water user cooperatives to facilitate farmer participation in tertiary level O&M. MARD subsequently issued a regulation advocating this model of irrigation management organization but it remains to be fully supported and widely adopted by provinces. This may be because it did not achieve tangible improvements in irrigation performance. The need for additional improvements, of main canals and tertiary units, was also identified.

85. TA 1968 also involved a number of inherent weaknesses. First an engineering bias towards O&M of infrastructure versus integrated management of irrigated agriculture. Second, while IRP implementation consultants are yet to publish a final report, their performance assessments and diagnoses, of the Song Chu and NNA irrigation systems, do not appear to have informed the formulation of the O&M strengthening program.¹⁵ Third tertiary canals were selected as pilots whereas main system management usually constrains performance. This insight resulted in the formation of the International Irrigation Management Institute in the early 1980s. Fourth activities were limited to a 5-year implementation period and did not extend beyond commissioning of the works and availability of improved water supplies. Finally, O&M strengthening activities were not linked directly to achievement of the IRP purpose of increased agricultural production through improved main system irrigation.

86. The IRP efficiency would have been improved by adoption of a participatory process with an initial phase of farmer organization to facilitate informed collective decision making, detailed social assessment of target groups and participatory performance assessment, and diagnosis of complete irrigation systems as well as the rehabilitation of priority structures. This would have provided sufficient lead time and a sound basis for participatory design of subsequent phase/s of an integrated program to improve irrigation performance.

87. This would have involved appropriate interventions in irrigation management, agricultural development, and selected infrastructure improvements and negotiation of an agreement for its implementation involving ADB, IAs, and farmer organizations. Irrigation and Drainage Management Companies (IMCs) might have been appointed IAs in view of their subsequent management responsibility. Farmers would have made significant equity cost contributions to later interventions as a proven means of improving participation and the economic efficiency of investments. Thus, IRP irrigation components were less efficient from both economic and process perspectives.

88. RDP irrigation, but not drainage, core subprojects were economically efficient (para. 65) but results may have been affected by (i) lack of recent severe flooding, (ii) reported delays in operating Thanh Diem irrigation pumps, and (iii) credible farmer satisfaction with drainage subprojects indicating possible benefits in excess of PCR reevaluation estimates.

¹⁵ SMEC, et al. 1997. *Final IRP Operation and Maintenance Pilot Strengthening Completion Report*.

89. TA 2233 diagnostic study assessed the performance of the BHH system (but did not quantify or diagnose specific constraints). It found nearly 30% of the service area suffers reduced yields annually, while another 5% is unharvested, due to flooding and waterlogging. About a third of the affected area also suffers drought and is concentrated in the northeast corner while the remainder is scattered throughout the service area. The diagnostic study of BHH also found nearly 30% of the cropped area suffers both spring and summer drought despite adequate water supply. The IMC, however, disputes this and claims the present capacity of the Xuan Quan Intake Sluice is limiting.

90. The RDP approach, treating individual structures as separate subprojects, suffers from a number of inherent weaknesses. First, none of the 30 RDP subprojects appear to have addressed the needs of the BHH northeast corner where cost effective interventions might be expected due to economies of scale. Second, although there is no evidence of extensive flooding in the southeast, the IMC reports the capacity of the gravity drainage outfall sluices is limited but was not increased due to the RDP subproject cost ceiling. Thirdly, the internal drainage PS subprojects (Co Do-Van Thang and Nam Ninh Binh) will be ineffective if the capacity of the gravity drainage system is limiting. Fourth, improvement of the gravity drainage system may offer a cost effective alternative to pump stations. Fifth, there are many internal flood prone areas that can only be drained by gravity. Finally, while drainage may be necessary, subproject performance indicates it may not be sufficient to increase agricultural production without complementary irrigation improvements.

91. The prevalence of drought indicates the present distribution of the available water supply is inequitable. Thus, irrigation management interventions, including improved flow division structures, may offer more cost effective alternatives to structures to increase water supplies. The PCR team was impressed by the agricultural support services that resulted in the impressive gains in rice yields (para. 72) since the multi-donor water resources sector review (para. 15). While it is not known whether the yield gap with the People's Republic of China has fully closed the PCR data indicate present spring rice yields of 4.5, 4.9, 6.0, and 6.4 t/ha in Thanh Diem, Phan Dong, Trieu Duong, and Thai Binh, respectively. It is not clear whether these big differences are due to different resource endowments or agricultural production technology. However, during the focus group meeting, Trieu Duong beneficiaries requested improved rice seed and varieties with a shorter growing season to avoid flood damage. Furthermore, farmers do not transplant their rice seedlings in rows, to facilitate weed control, indicating further scope to improve agricultural technology and increase rice yields.

92. The PCR found RDP efficiency was limited by (i) investments were not based on long-term planning for improved system performance through integrated operational and infrastructure interventions, and (ii) the limited participation of the primary stakeholders.¹⁶ This finding is endorsed and a practical phased alternative elaborated above (para. 86). Overall, RDP irrigation subprojects were efficient and drainage subprojects less efficient.

93. Financial analyses, of typical RCP enterprises, were prepared at appraisal in lieu of economic analysis. RCP was expected to benefit about 102,000 rural households including 25,000 poor members of PCFs. The 2001 ADB review mission indicates VBARD made 79,698 medium-term subloans for \$41.5 million. CCF made 45,683 short-term subloans for \$22.5 million. However, original credit lines were for \$32.0 and \$14.8 million, respectively. Thus, allowing for relending, between 90,000 and 125,000 rural households benefited. The targeted loan ceiling (\$100/subloan) proved restrictive and many households reportedly also took normal

¹⁶ ADB. 2002. Draft PCR of the Red River Delta Water Resources Sector Project. Manila.

CCF short-term loans. Thus, between 10,000 and 15,000 poor households benefited from CCF loans and RCP was only partly successful in meeting lending targets.

94. Furthermore, reevaluation found the combined VBARD and CPCF portfolios generated about 220,000 person-years of employment which is less than 60% of the estimated 380,000 person-years generated by the approximate appraisal enterprise mix (para. 79). Thus, RCP was less efficient than intended in generating productive rural employment.

95. RDP also failed to respond to actual demand. First, employment fell short of potential because of lack of anticipated demand for medium-term agroprocessing loans (para. 78). Second, the large proportion of irrigation pumping loans are likely to have been for crop production, including rice, rather than for diversification of rural activities as anticipated at appraisal. Third, 90% of borrowing for agroprocessing was in the form of short-term CPCF loans rather than the medium-term VBARD loans envisaged at appraisal. Finally, RCF did not meet the demand for production credit in RDP project areas reconfirmed during both the focus group meeting and PCR social assessment. Formulation did not identify target groups, including poor rice farmers, and design credit services to meet their specific needs and promote social inclusion. Thus, RCP was less efficient from the key process perspective as well as in meeting lending targets and generating productive rural employment.

D. Sustainability

96. While irrigation sustainability issues are complex, the general principles are common to both IRP and RDP. The main difference is that RDP involves substantial additional costs, mainly for electricity supplies, to operate and maintain both irrigation and drainage pumps in addition to the gravity systems. Viet Nam has a long pragmatic history of keeping key water resources infrastructure functional with limited resources. The high proportion of 40-year old pumps and motors, still operating in the Red River Delta, is evidence of this.¹⁷ On the other hand, deterioration of infrastructure provided the rationale for both IRP and RDP. It remains to be seen whether present O&M arrangements are sustainable and the common cycle of deferred maintenance, deteriorated structures, and periodic rehabilitation can be avoided.

97. O&M services are partly subsidized although irrigation and drainage fees are well accepted. For example, depending on the season, BHH collections range from 65% to 90% of assessments and cover only 70–80% of expenses. Furthermore, the provinces often pay for pumping while the Government continues to subsidize electricity tariffs. While 1995 staff salaries and overheads were only about 20% of total O&M expenditure, there was evidence they were increasing.¹⁸ Thus, infrastructure, particularly the Hanoi Dike, is most likely sustainable as long as the Government continues to subsidize adequate O&M services.

98. However, subsidized services are associated with the present low-level equilibrium. Only two thirds of the service area (3 million ha) is actually irrigated and agricultural production is only about 60% of the potential (para. 15). Adoption of a policy to improve irrigation performance and increase agricultural production would require improved governance and management involving institutional capacity building, beneficiary participation, and transfer of some management authority and benefits as well as O&M responsibilities and costs. Thus, IRP and RDP irrigated agriculture benefits are both only likely sustainable.

¹⁷ ADB. 2002. Draft PCR of the Red River Delta Water Resources Sector Project. Manila.

¹⁸ NHC, et al. 1997. *Diagnostic Study of the Bac Hang Hai Irrigation and Drainage System*.

99. The RCP institutional strengthening component loan appraisal training contributed to the high recovery rate reported to be more than 95%. However, VBARD is yet to fully adopt international accounting standards, and despite its apparent financial sustainability, the Government has decided to delay expansion in favour of further consolidation of the PCF network. Furthermore, RCP sustainability is likely to reflect the limited degree to which it met actual demand for credit services (para. 95). Thus, RCP was only likely sustainable.

E. Institutional Development

100. The formation and building of CPO implementation capacity represents a significant achievement of IRP consolidated under RDP. After initial teething problems, due to a lack of familiarity with ADB procedures, the CPO has continued to expand and perform credibly. It is now implementing the World Bank-financed *Mekong Delta Water Resources Project*. This traditional engineering design and implementation capacity was entirely appropriate to the Hanoi Dike component of the IRP and institutional development was substantial.

101. For IRP and RDP irrigation and drainage components, the additional challenge was to diversify this initial engineering capacity and build a multidisciplinary institutional capacity to improve the performance of irrigated agriculture. The provincial IMCs should, preferably, have been responsible for project implementation as well as subsequent system management. A good start was made under the IRP when the provinces of Quang Tri and Quang Binh implemented additional emergency flood protection works efficiently with technical support from the CPO. However, the CPO was unable to adapt to realize the benefits of the flexible RDP sector approach. The IRP and RDP irrigation management interventions were not entirely effective and the holistic system approach to irrigated agriculture was not adopted by the Government. Thus, for both IRP and RDP irrigation and drainage components, institutional development was moderate.

102. The RCP built institutional loan assessment capacity but not capacity to identify target groups, assess their needs and design appropriate credit services specific to each group. Thus, the institutional development impact of RCP was moderate.

Criterion	Weight	Rating Value					Weighted Rating				
		IRP		RDP		RCP	IRP		RDP		RCP
		Hanoi	Irrig.	Irrig.	Drain.		Hanoi	Irrig.	Irrig.	Drain.	
Relevance	0.20	2	1	1	1	2	0.40	0.20	0.20	0.20	0.40
Efficacy	0.25	3	1	3	1	2	0.75	0.25	0.75	0.25	0.50
Efficiency	0.20	3	1	2	1	1	0.60	0.20	0.40	0.20	0.20
Sustainability	0.20	3	2	2	2	2	0.60	0.40	0.40	0.40	0.40
Institutional	0.15	3	2	2	2	2	0.45	0.30	0.30	0.30	0.30
Overall	1.00						2.80	1.35	2.05	1.35	1.80
Components							HS	LS	S	LS	S
Projects							S		S		S

103. The above table presents overall project ratings. All three projects are satisfactory but this conceals considerable variation especially within the two infrastructure projects. The IRP Hanoi Dike component was highly satisfactory, RDP irrigation subprojects were satisfactory, and the RDP drainage and IRP irrigation components were both less satisfactory.

V. ASSESSMENT OF ADB AND THE GOVERNMENT

104. The above evaluation (Section IV) indicates that while implementation was generally satisfactory, all three designs were less than satisfactory. First, they did not directly address the growth with equity focus of the Government's Socio-Economic Development Strategy and ADB's evolving poverty agenda. Second, they were not part of an integrated strategy to improve irrigated agriculture and realize considerable production and poverty alleviation benefits. Despite the lessons of experience provision of infrastructure or credit were treated as sufficient to increase production. Consulting services were not linked to holistic irrigation system management and agricultural production targets and agricultural support was not provided. Finally, target beneficiary groups were not involved in design or implementation.

105. These evaluation findings reflect the results of the 1998 ADB *Special Evaluation Study of Factors Affecting Project Performance in the Agriculture and Social Sectors* (AGSO). This was based on a review of postevaluation reports between 1991 and 1997 and found that the performance of AGSO projects was consistently lower than energy and infrastructure projects. It recognized, however, that it is particularly important AGSO projects perform even better because they have more social and poverty impacts than other sectors irrespective of strategic development objective classifications.

106. The typically monitored indicators of project performance—implementation delays, cost overruns, and supervision—significantly affected performance only of energy and infrastructure projects but were insufficient to improve the performance of AGSO projects.

107. Regression models identified macroeconomic performance, policy, and governance as the most significant determinants of AGSO project success. The Government's renovation (*doi moi*) reforms provided a macroeconomic and policy environment conducive to development (para. 3). This implies improved governance is a critical issue in improving the performance of AGSO projects including irrigated agriculture. The next determinants of AGSO project success, confirming the importance of institutions, were the EA's capability to supervise project implementation and the subsequent utilization of project facilities during operation.

108. Adequacy of maintenance and repair was not a significant determinant of success. This may be due to the small sample of AGSO projects with adequate maintenance ratings but may also indicate maintenance is a symptom rather than a cause of poor performance (para. 19). The significance of utilization of facilities also emphasizes the relative importance of operations compared with maintenance. This confirms the need to put the "O" into O&M and avoid the common engineering infrastructure bias in irrigated agriculture (para. 17).

109. ADB's main contribution to AGSO project success came during project preparation. While project preparatory TAs are largely necessary, they are by no means sufficient and the quality of design at entry was a significant determinant of success particularly of irrigation and rural development projects. The performance of consultants during implementation was also a significant determinant of success depending on the quality of design at entry.

110. The project performance reports, prepared by the most recent review missions, indicate implementation progress and compliance with covenants are rated satisfactory for all three projects. The concurrent PCR also rated the performance of the RDP borrower and EA as satisfactory despite CPO difficulties in fully adapting to the sector approach and in preparing subproject appraisals, including social assessments, to meet ADB requirements. These findings are endorsed and government performance rated satisfactory for all three projects.

111. ADB clearly responded to the country context and government priorities at the time of the renovation (*doi moi*) reforms. IRP and RDP were consistent with the Government's 1993 Water Resources Investment Plan emphasizing emergency rehabilitation and upgrading of priority infrastructure. RCP also addressed acute supply constraints to meet the demand for credit. However, the designs of all three projects were less responsive to either the Government's Socio-Economic Development Strategy, emphasizing growth with equity, or ADB's complementary country assistance strategy and evolving poverty reduction agenda. Furthermore, many of the shortcomings, contributing to lower component ratings (para. 103), can be traced to incomplete project designs and ADB performance was barely satisfactory.

112. The terms of reference also require consideration of the extent to which the key lessons, of initial post-reunification experience, have been incorporated in the design of the next generation of agricultural projects. This also provides a basis for assessment of ADB performance.

113. The November 2000 RRP for the Rural Enterprise Finance Project indicates design was based on the results of TA 3227 for strengthening VBARD corporate governance and the lessons learnt from implementing RCP without benefit of either project preparatory TA or social assessment. Seventy percent, by number, of subloans were targeted at poor households making the project a core poverty intervention under ADB's new 2001 loan classification. However, this represents only 32% by amount. The remaining subloans were for micro and small rural enterprises despite the lack of demand for the agroprocessing subloans under RCP.

114. The October 2001 RRP for the Second Red River Basin Sector Project indicates design was based on a project preparatory TA.¹⁹ The design incorporates several innovations compared with the previous RDP. First, introduction of integrated river basin management as well as investment subprojects. Second, while appraisal, cost contribution, and implementation arrangements have all been improved, the project also involves an ambitious expansion of scope to include seven upland provinces but only five delta provinces of the type covered under RDP. Finally, the new project includes agricultural support services (excluding credit), but not irrigation management, through a rural development support (RDS) component.

115. While the new participatory RDS component is an improvement, the present design suffers from several practical difficulties. Participation in RDS is not linked to participation in subproject formulation and implementation to improve efficacy and efficiency. RDS social mobilization, for example, is to start after subproject approval by MARD and the provinces. Furthermore, to ensure adequate financial support, fixed proportions of investment costs are to be spent on RDS at the risk of it becoming supply driven and thus ineffective.

116. The RDP sector project was clearly underresourced with only 59 person-months of international consulting services provided for the first 18 months compared with the more conventional and relatively straightforward IRP (151 person-months). Consideration of the above and the relative degree of innovation and challenge involved in implementing the two Second Red River Basin Water Resources Sector Project (RBP) components leads to the following reallocation assuming the total is fixed: (i) upland and delta subprojects and RDS (244 person-months), and (ii) water resources management (122 person-months). Thus, the present allocation to subprojects and RDS (116 person-months) is about half the requirement.

¹⁹ TA 3050-VIE: *Second Red River Basin Water Resources Sector*, for \$600,000, approved on 22 July 1998.

117. The rationale for expanding the scope from the delta to the entire basin seems to have been (i) introduction of integrated river basin management, and (ii) justification of the primary poverty classification. The incidence of poverty is higher in the uplands than in the delta: 51% versus 39% in the 12 selected provinces. However, the delta is the most densely populated area in Viet Nam with a rural population of about 16 million. Thus it contains many more poor people: 728,538 in only five delta provinces, versus 704,748 households in seven upland provinces.²⁰ Thus, the large delta irrigation systems offer a more cost-effective means of reducing poverty than small-scale upland systems. It is not known why a second Rural Infrastructure Project did not focus on the specific needs of poor upland communities.

118. Thus, the design of the new project is not as closely focused on its main purposes, of increasing agricultural production and reducing poverty, and does not incorporate the key lessons from implementing RDP regarding the (i) less successful drainage, compared with irrigation, subprojects; (ii) need for a holistic system approach involving provision of irrigation management and credit, as well as agricultural and infrastructure, interventions; and (iii) much larger potential for, and relative cost effectiveness of, interventions in the delta, where most poor people live, compared with the uplands. Thus, the performance of ADB has been less than satisfactory and there is considerable room for improvement.

VI. ISSUES, LESSONS, AND FOLLOW-UP ACTIONS

119. A recent review of bilateral cooperation came to similar conclusions to the present evaluation of poverty and agriculture.²¹ It notes Viet Nam remains a poor country and most of her population are (rice) farmers. Thus, the strategic recommendations focus on effective ways of supporting systematic institutional change, through a consciously pragmatic and long-term (20-year) approach, to alleviate poverty based on sustainable rural growth. The central recommendation, to invest more in participating in a learning process in Viet Nam's development, is based on the following characteristics of Vietnamese change processes.

120. Despite popular perceptions, Vietnamese decision-making is not highly centralized, many officials are pragmatic, and the value of change is seen in practice, rather than in the abstract. Policies (which are often rather general) are evaluated through the results of practical trials and experiments and are usually only implementable if those upon whom they operate are in agreement. Change takes place "from below" with new methods, ways, and results explored and assessed "in reality." Thus, orthodox policy dialogue does not generate high returns and nurturing "bottom-up" learning processes and building "social capital" is more likely to be effective. Proximity to, and close involvement in, heuristic change processes "makes the difference" in terms of effective development cooperation, avoids confrontation, and encourages interventions tailored to what is feasible at the time.

121. While the review found that "what you do" is not as important "how you do it," it also advocated rural development as a key activity area of poverty-focused development. Thus, irrigated agriculture offers ADB an opportunity to simultaneously achieve dual objectives by (i) pursuing pragmatic productivity gains and poverty alleviation results while (ii) facilitating and documenting effective participatory learning and institutional change processes.

²⁰ Minot, N. and R. Baulch. 2002. *The Spatial Distribution of Poverty in Viet Nam and Potential for Targeting*, IFPRI, using standard poverty line (footnote 1) supplemented by 2001 MOLISA provincial population data.

²¹ Fford, A. 1999 *Vietnamese-Australian Cooperation-"From Unconscious to Conscious Pragmatism": Some Lessons from Experience and Recommendations for the Future Strategic Framework*.

122. The main lessons of the evaluation are (i) there is considerable potential to improve the performance of irrigated agriculture and alleviate poverty, (ii) project design is critical to success, (iii) so too is effective TA to support innovation in (iv) improved governance, institutional change and participation in formulation and implementation, (v) operating entities should be appointed as implementing agencies, (vi) infrastructure and credit are necessary but clearly insufficient, (vii) complementary irrigation management and agricultural interventions are also necessary, (viii) ADB missed an opportunity to promote a more holistic irrigation system improvement approach, and (ix) the recent reorganization of ADB and merger of the former Ministry of Water Resources, with the present MARD, now provide a better opportunity to pursue an integrated approach to improving the performance of the irrigated agriculture subsector.

123. The main recommendations are (i) reorientate the country strategy and policy dialogue to emphasize irrigated agriculture; (ii) progressively develop a subsector strategy; (iii) implement a pilot program to develop and document participatory processes for irrigation systems in (a) social assessment, (b) performance assessment and diagnosis, and (c) integrated performance improvement interventions involving irrigation management, agriculture and credit, and phased improvement of priority infrastructure; and (iv) adopt a flexible phased design of future sector projects (para. 86). The impending implementation of RBP provides an ideal opportunity. This might commence with a protracted inception phase to review and reorientate the design with all stakeholders and review agricultural potential and constraints, reasons for apparent poor performance of RDP drainage subprojects and MARD preferences regarding IRP irrigation management innovations, results of the BHH system diagnosis, and the holistic system approach to managing irrigated agriculture.