REPORT

The Economic Impact of Cluster Initiatives

The Competitiveness Initiative Project in Sri Lanka

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Contents

Interim Assessment of the Economic Impact of Cluster Initiatives

The Competitiveness Initiative (TCI) project in Sri Lanka began organizing industry clusters and developing industry strategies at the end of 1999. Since then, USAID projects in many other countries have also pursued the cluster concept to promote competitiveness and encourage private sector development. Despite its popularity, this approach remains controversial. Even today, little evidence exists on the economic impact of cluster initiatives as an effective form of aid intervention to promote economic development. As Michael Porter recently wrote, "we have surprisingly little systematic knowledge of these initiatives, their structure, and their outcomes."[1]

The design of TCI and its performance indicators focused on process criteria. Nonetheless, USAID is now rightly asking about the economic impact of the cluster initiatives. Have they delivered substantial benefits for the economy of Sri Lanka? Are the benefits sufficient to justify using foreign assistance resources for this purpose? Are particular cluster activities especially successful, suggesting lessons to improve the design of competitiveness projects? This paper summarizes the main findings of a recent report to USAID/Colombo, which sought to answer these questions by assessing the prospective economic impact of competitiveness initiatives undertaken by eight cluster groups that have been organized and supported by TCI.[2]

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[1] From Porter's Foreword to Solvell, Lindqvist and Ketels, *The Competitiveness Initiative Greenbook*, Gothenburg University, September 2003, p.5. This volume reports results of survey evidence on 238 clusters worldwide. Even with the survey results—again quoting Porter—"data limitations preclude definitive findings regarding the performance of cluster initiatives."

[2] The cluster groups are rubber, tea, tourism, spices, gems and jewelry (G&J), coir, ceramics, and information and communications technology (ICT). The present analysis is based on information compiled during field work in Colombo in November 2003. The analysis also draws heavily on exploratory work conducted by Andrew Warner and Maureen Harrington, J.E. Austin Associates, April 2003; hereinafter referred to as Warner and Harrington (2003).

Methodology

The concept of "economic impact" used here is derived from standard methodology for the economic evaluation of development projects. Impact is defined as the expected present value of additional net income[3] generated directly by TCI cluster initiatives. The analysis focuses on impacts that satisfy three screening criteria:[4]

- ***Highly probable***. The analysis only includes activities that are at an advanced stage of planning and have a high probability (>.75) of being implemented within 12 to 24 months. The estimated present value of net income is discounted to the extent that implementation is uncertain.
- ***Attributable***. A key objective of field interviews was to determine the extent to which the role of the TCI cluster was critical in producing the economic benefits or accelerating the realization of benefits. The analysis excludes activities that are likely to have been pursued through other channels. Also, the impact estimates are discounted for the possibility that similar outcomes could have occurred without TCI support.
- ***Quantifiable***. The analysis only covers activities for which there is a sound basis for impact calculations based on information from cluster coordinators, cluster members, strategy documents, roadmaps, business plans, feasibility studies, and data compiled by Warner and Harrington (2003).[5] Impact estimates that would require a host of suppositions are excluded.

The methodology unavoidably applies a mixture of measurement and judgment. As far as possible, the judgments and data adjustments err on the conservative side. Also, the analysis is limited to direct effects of the cluster activities. It does not include inter-industry linkages, multiplier effects, or dynamic benefits that may arise as investors and producers in the future respond to higher profit margins or new market opportunities. All of these restrictions ensure that the estimates represent a lower bound on the net economic impact of TCI cluster initiatives.

The resulting impact estimate is then set against the cost of USAID support, giving a lower-bound benefit-cost ratio for the overall *portfolio* of TCI cluster initiatives—in terms of quantifiable impacts. It is important to emphasize the portfolio concept. Like a venture capital operation, one must expect that some initiatives will be big winners, some will yield moderate or low returns, and some will yield nothing. This is exactly what happened with TCI. After the fact, it is easy to pinpoint the best investments, but it is impossible to predict at the outset

[3] Net income for each period is the prospective increase in revenue less capital and current costs, at constant 2003 prices. The analysis uses a discount rate of 15 percent, which is taken as the risk-adjusted threshold rate of return on capital.
[4] Cluster activities were also excluded if the economic impact appeared to be very small.
[5] Because of tight time constraints, the assignment did not include independent compilation of primary data. Figures compiled by Warner and Harrington (2003) were re-checked where possible, and in some cases altered on the basis of more recent information.

which of the clusters or activities will produce large benefits. Investing in a diversified set of cluster initiative activities is therefore the best strategy to maximize return relative to risk.

Economic Impact of TCI Cluster Initiatives

From field interviews and a review of TCI documents, eight major cluster activities were selected for analysis based on the established screening criteria: a high probability of near-term realization, clear attribution to TCI, and adequate data for quantification. This section describes six other cluster initiatives that are highly probable and clearly attributable to TCI, but for which data are not sufficient to support an impact estimate. This section also describes 10 other cluster activities at various stages of development that have the potential to add a substantial economic impact to the program.

QUANTIFIABLE ECONOMIC IMPACTS

Expanding Natural Rubber Supplies—Moneragala Program

A major outcome of the rubber cluster is a program to expand production of natural rubber by opening a large area in Moneragala, the most impoverished region in Sri Lanka.[6] The program is motivated by the fact that rubber production in Sri Lanka has declined from more than 156,000 mt in the late 1970s to about 86,000 mt in 2001, and no new land is available in the main growing areas. At the same time, a competitive rubber manufacturing industry has emerged. Faced with declining domestic supplies, some manufacturers have considered moving operations overseas or relying on imported raw materials. Only after the rubber cluster was organized through TCI did the industry consider upstream investment in rubber production to ensure domestic supplies.

The Moneragala region is well-suited for rubber, yet no major investment has been made because of the remote location and earlier civil disorder. The new program aims to establish 40,000 hectares of plantings over a 10-year period. This will increase rubber production by 78,000 mt, or more than $70 million per year. The program will create jobs for 77,000 people in plantations and factories. The required investment of $100 million is to be financed by major investors on a commercial basis. The government has a critical role in allocating state land for the plantations, implementing the planned southern highway and the Hambantota port project, underwriting rubber research, and supporting smallholder cultivation. Although financing is not yet locked in, industry leaders are committed to realizing the investment. According to the TCI feasibility study, the real rate of return is between 19 and 36 percent,

[6] "Connecting to Growth: Sri Lanka's Poverty Reduction Strategy," Part II of Government of Sri Lanka, *Regaining Sri Lanka: Vision and Strategy for Accelerating Development*, December 2002.

depending on intercropping,[7] so the investment is fundamentally viable. The main uncertainty (as of November 2003) is whether the government will approve the lease of land. In a recent meeting, however, the Minister of Lands indicated that he will indeed approve the industry's proposal.

This program is fully attributable to the work of the rubber cluster and technical assistance through TCI. Indeed, there is good reason to believe that a collaborative approach was essential. Opening a remote region would be difficult for any single investor because of the infrastructure costs. Also, cluster support gave the industry a strong hand in obtaining land.

To be conservative, the benefit calculation assumes 2,000 hectares of planting per year, but otherwise uses financial projections from the feasibility study. On this basis the program yields an estimated present value of net additional income (capital and labor) of $120 million. To adjust for uncertainty about implementation, the benefits are discounted by 20 percent. Given the declining trend in rubber production and firming of rubber prices, a comparable program might have emerged through other channels. Hence, only the first five years of plantings are attributed here to TCI. After these adjustments, the present value of net additional income from the program is $37 million.

Upgrading Crepe Rubber Exports (Lankaprene)

The rubber cluster has pursued a program to upgrade the quality of crepe rubber exports and to forge new links with customers in the United States for the higher grade product, called Lankaprene. An order was recently received at a price of $2 per kg, which is $0.80 more than the prevailing price for traditional crepe. The market is virtually assured because the main competition—synthetic crepe—sells for $3 to $4 per kg. Capital costs and operating costs for the upgrade are low, so most crepe factories are likely to convert to the new process. Within two years, Lankaprene production should reach 20,000 kg, generating US$16 million in additional export earnings.

The Lankaprene story is entirely an outcome of the rubber cluster. The program emerged from cluster discussions about rubber sector strategy, and has been carried out with a strong impetus from TCI in the form of technical assistance and a trip to Akron, Ohio, to meet potential customers. No similar development was under consideration through other channels. Yet Lankaprene is so profitable that the possibility cannot be ruled out that major players might have pursued this innovation at their own expense or through other channels. The cluster chair acknowledged this, but emphasized that without TCI "it would have taken many more years, at best."[8]

[7] The feasibility study includes projections for intercropping with sugar, pepper, and bananas.
[8] Interview, November 20, 2003.

To quantify the economic impact, the analysis uses conservative assumptions about the volume of Lankaprene exports, and limits the benefits to 5 years on grounds that a comparable innovation might have arisen beyond that time frame through other channels in response to the profit opportunity. This gives an estimated present value of additional net earnings of US$31 million. After discounting (by 10 percent) for uncertainty about the supply response, the adjusted net present value is $28 million.

The benefits may extend more widely because the enhancement of value at the processing stage may stimulate greater demand for natural rubber. Presently, crepe producers rely on latex from their own plantations. Now, some of the processors are likely to seek other sources of supply. The added competition should increase latex prices and benefit rubber producers generally, including smallholders. In the long run, higher profit margins should also stimulate investment in crepe processing facilities and rubber plantations. The benefit calculation does not include these indirect effects.

Upgrading Gemstone Quality (GemLab)

In 2002, Sri Lanka exported $86 million worth of gems, excluding diamonds. To enhance the value of these exports, one major initiative of the gem and jewelry (G&J) cluster is to establish an internationally accredited laboratory in Sri Lanka to certify the value, quality, and origin of gemstones. This process can add 10 percent or more to the value of the stones.[9] Presently, gems are sent by courier to expensive overseas labs or to international trade shows for certification. Because of the high costs involved, only a small fraction of the exports are certified. The GemLab business plan, developed through TCI, indicates that a local facility equipped to international standards could certify stones at a cost of $70 each. At this price the process would pay off for about 25 percent (by value) of the gems that are now exported without certification. If all of the suitable stones were to be certified, the value of gemstone exports would rise by nearly $2 million per year.[10] In addition, the lab will allow gem traders to reduce their working capital costs, which are a large component of the cost structure, because certification will be faster and certified gems sell more quickly. This initiative is totally attributable to the G&J cluster and the technical support provided by TCI.

Using conservative assumptions about the utilization rate for the GemLab and cost estimates from the business plan, the present value of additional net income from the enhancement of gemstone value is $3 million. (This estimate does not include the reduction in the cost of working capital.) For this analysis, the probability of implementation is estimated at 75 percent. This gives an adjusted net present value of $2.2 million.

[9] Warner and Harrington (2003).
[10] The figures are derived from data in the Ceylon Gem Testing Center Business Plan (2003).

Energy Cost Savings for the Ceramics Industry

Only one cluster initiative resulted in a "quick win"—a reduction in energy costs for the ceramics cluster. The cluster negotiated with Shell Gas a 5 percent volume rebate on liquefied petroleum gas (LPG) consumption. The full rebate was applied to companies purchasing at least 150 tons of gas per month, with lower discounts for smaller customers. Shell also agreed to adopt a transparent pricing formula, assuring the industry that subsequent price adjustments would reflect market conditions, not monopoly power. Subsequently, a local company was licensed to compete with Shell, and the cluster used this leverage to obtain another 7.5 percent discount.

Warner and Harrington (2003) estimate that energy costs account, on average, for 20 percent of the supply price of ceramic exports, which totaled $42 million in 2002. Based on these figures, the industry is saving just over $500,000 per year on energy costs as a result of the LPG discounts. The present value of the cost savings over a 5-year period is $1.8 million.

The initial rebate was fully a cluster outcome, but the second-round discount was sparked by the entry of a competing supplier. Larger companies would probably have obtained at least some of this benefit on their own. Thus, the impact analysis assumes that 100 percent of the initial rebate is a TCI benefit, but only 50 percent of the second discount. With this adjustment, the present value of the cost savings is $1.2 million.[11]

Other Quantifiable Impacts

Four TCI cluster activities satisfied the screening criteria but yield less substantial benefits, at least in terms of what can be quantified at this time.

FINANCING AN ECOLODGE

The tourism cluster is developing eco-tourism as a new product to broaden the market and increase expenditure per tourist. To test this market and establish best practices for further developments, six cluster members have committed $900,000 to finance an Ecolodge abutting the Sinharaja Biosphere Reserve. The total investment is estimated at $1.6 million, including $300,000 for the value of land conveyed by the tea plantation where the lodge is to be built. The balance, if necessary, will be financed by a loan. USAID/AEP has agreed to leverage the private investment with a $900,000 grant for research that will be conducted in conjunction with the Ecolodge. This project is entirely attributable to the cluster initiative and technical assistance provided by TCI. Based on the feasibility study, the present value of the prospective net economic benefit is $680,000. Discounting this figure by 20 percent for uncertainty about implementation gives an estimated net present value of $540,000.

[11] There are two interesting indirect effects, which work in opposite directions. First, after the ceramics cluster negotiated a volume rebate, Shell extended the same deal to other bulk purchasers of LPG. This outcome implies that the overall benefit to the economy is greater than the benefit to the cluster alone. But, the price reduction is essentially a transfer from the supplier to the customer, and the supplier, Shell, is half owned by the government. Thus, half the benefit to LPG customers is a loss accruing to the Treasury, not a real resource saving for the economy.

UPGRADING THE MARKET FOR COIR

The coir cluster has arranged to have Sri Lankan coir fiber and products tested in European and American laboratories. The tests in Europe have been completed. The objective is to penetrate European markets for industrial applications such as biodegradable padding for automobiles. Testing in the United States will take place in 2004 to certify the characteristics of the fiber. Thereafter, Sri Lankan coir can be listed as an approved material for erosion control matting in road and transport projects in various states. As a result, low-value fiber exports to China will be diverted to higher-value exports of fiber and mats to the United States. This development is unambiguously attributable to the coir cluster and supporting technical assistance through TCI. Looking only at the U.S. market, for which volume and value estimates could be obtained, the initiative is expected to enhance the present value of net income for Sri Lankan producers by $630,000. Discounting this by 20 percent for the fact that implementation is not yet certain, the adjusted impact is $500,000.

DEVELOPING A TEA COLOR SEPARATOR

The tea cluster has been working with the University of Moratuwa to develop a locally produced color separation machine that can be used to upgrade the quality of tea supplied to the auction. Presently, the only available color separators are imported at a cost of about Rs 10 million, which limits their use. The target price for the locally produced separator is Rs 2 million. At this price, the industry is expected to absorb 250 additional machines over a 5-year period. Each one will process an estimated 2000 kg of tea leaves per day, adding approximately Rs 6 per kg to the value of the crop. The present value of the additional net income is Rs 25 million, or $250,000. This impact is fully attributable to the cluster initiative. Discounting this figure by 25 percent for uncertainty about implementation, the adjusted net benefit is slightly less than $200,000.

BRANDING CEYLON SAPPHIRE

To date, eight members of the gem and jewelry cluster have committed to investing $50,000 each to establish the Ceylon Sapphire Council (CSC). This investment will be matched by a $350,000 equity investment from the Export Development Board, and a $600,000 grant from the government. CSC will handle the marketing of upscale jewelry exports in collaboration with Stephen Webster Ltd., a renowned jewelry designer in the United Kingdom. This initiative is unambiguously a result of the TCI cluster and technical assistance from TCI. Assessing the economic impact, the higher price that CSC products will fetch is matched by higher marketing costs. The business plan shows a positive yield for the venture because the government subsidy is treated as income. If the subsidy is treated as a cost to the economy, then the net present value over a 5-year time horizon turns out to be negative. Even though

the initiative does not appear to have a positive payoff in terms of benefits that are now quantifiable, it is clearly intended as a strategic move to reposition the industry into the market for high-quality jewelry. If the effort succeeds, the eventual benefit will more than compensate for the once-off subsidy.[12]

OTHER PROBABLE BENEFITS

The preceding estimates cover only a subset of the cluster initiatives that are likely to generate significant benefits with clear attribution to TCI. For several other initiatives it has not been possible to quantify the benefits, for lack of data. But it should be possible to do so later. Examples include

- ***Tea notes.*** The tea cluster is working with a leading banker to allow tea suppliers to finance working capital requirements by issuing commercial paper underwritten by banks, using tea stocks as collateral. More than half of the tea factories now depend on advances from tea brokers. By issuing "tea notes," they may reduce financing costs by 3 to 4 percentage points. The legal arrangements should be completed in 2004. Given the size of the industry and the cost reduction, the economic impact is potentially large.
- ***Lalan rubber supply consolidation.*** One advantage of cluster deliberations is that personal exchanges can lead to new ideas that help to sustain a dynamic and competitive industry. An interesting example of such an exchange occurred as a by-product of rubber cluster meetings. The Lalan Rubber Group is a pioneering producer of latex gloves in Sri Lanka. Because of periodic shortages of local latex, the company has been considering relocating its plants to Vietnam or Thailand. At the same time, the Bogawantalawa Plantation (BP) was short of cash for replanting or expanding operations. Despite the fact that BP was a major supplier to Lalan, the heads of these organizations never discussed their mutual concerns until they met at a cluster meeting. As a result of this contact Lalan has committed to infuse $3.8 million of equity into BP to rehabilitate the plantation. Lalan will remain in Sri Lanka, and BP has a bright future. Thousands of jobs will be saved in Lalan and thousands more created in BP.
- ***Pilot project for village-level quality upgrade for spice.*** The spice cluster is working with cooperative associations in five villages to establish pilot projects to improve the quality of spice products through better blanching, thrashing, and drying processes. This will require an investment in new equipment costing Rs700,000 per unit. The cluster is working with the Ministry of Agriculture and Livestock to obtain seed capital and the Samurdhi Authority to develop a supporting loan program. If the farmers obtain a 10 to 20 percent price premium as anticipated, the pilot program could be widely replicated.

[12] An example of how a once-off subsidy can help domestic producers establish a successful and sustainable new market opportunity is the case of Dilmah Tea.

- ***High-yielding cardamom initiative.*** Following discussions in the spice cluster about low yields for locally grown spice varieties, one cluster member imported an improved variety of cardamom from India and shared the plants with the government for distribution to other spice growers. This variety can increase yields from 60 kg to approximately 1000 kg per hectare.
- ***Web portals.*** With TCI technical support, both the gem and jewelry and ceramics clusters have developed web portals to market their wares to the world. Establishing an electronic venue for shoppers can generate a large increase in demand. The website administrators are monitoring the number of hits on these web portals, but no information has been compiled about the number or value of orders obtained over the Internet. With cluster members' cooperation, it should be possible to obtain useful data on the economic impact.

OTHER POSSIBLE BENEFITS

For quite a few other cluster initiatives the impact is either too uncertain to assess at this time, or inherently difficult to measure. Examples include

- ICT: Virtual business incubator
- ICT: Centers of excellence
- Tourism: Institute for Tourism and Hotel Management
- Spices: Maturata plantation study
- Spices: HS code bifurcation for cinnamon
- Gem & jewelry: Gem & Jewelry Institute CAM/CAD training
- Ceramics cluster: pilot plant, joint R&D
- Ceramics cluster: joint procurement strategies
- Coir: model mill, joint R&D

Even though the impact cannot now be ascertained, some of these activities might contribute significantly to the project's ultimate impact.

Pulling it Together: The Benefit-Cost Test

The analysis in this paper focuses on the eight initiatives discussed in the section on Quantifiable Economic Impacts, namely, those that are highly probable, directly attributable to TCI cluster initiatives, and quantifiable using available data. For these eight activities, the present value of net additional income totals $156 million. Factoring in uncertainty about implementation and the possibility that similar outcomes might have materialized without TCI, the adjusted net present value totals $69 million.

The study next examined the overall budget for TCI to identify expenses attributable to the cluster initiatives, as distinct from charges incurred for other project components. Pro-rating the overheads the cumulative cost of the cluster initiatives is slightly less than $7 million.

Comparing the project cost to the adjusted estimate of net economic benefits for the eight initiatives yields a benefit–cost ratio of approximately 10:1. Each $1 of USAID funding for TCI cluster initiatives has generated $10 of measurable net benefits for the economy of Sri Lanka.[13]

It is important to reiterate that this is a lower-bound estimate on three accounts. First, the analysis includes only those benefits that are highly probable, attributable, and quantifiable using available data. Second, conservative assumptions are used at every step. Third, the analysis excludes potential dynamic effects from improved competitiveness, and indirect benefits through inter-industry linkages and multiplier effects. For example, many people who have worked on TCI cluster initiatives point to a discernible "change in mindset" among industry leaders, which may lead to many future innovations.

Additional Economic Benefits of TCI

In addition to cluster initiatives, TCI has three other major components: supporting public–private dialogue on competitiveness, assisting government initiatives with economic reform to improve competitiveness, and mobilizing support for competitiveness. The impact of these components may be quite important, but it is inherently difficult to measure.

TCI clusters have been influencing policies to foster private sector growth. One outcome is the government's assent to allow industry groups to determine how to use revenue generated through cesses. This devolution of funds and authority to the private sector is a radical departure from the previous policy.

TCI clusters have been redefining the role of public–private partnerships. For example, the information and communications technology cluster has been a leading source of strategic visioning and political support for the E-Sri Lanka program. The tourism cluster has played a key role in transforming the Sri Lanka Tourist Board into a Tourism Development Council, with private participation in management planning, regulatory functions, and five regional councils for tourism development. A Tourism Marketing Bureau, as a private corporate body, will receive 80 percent of funds raised by government taxes on the industry. The rubber cluster successfully lobbied for the Ministry of Plantation Industries to abandon a proposed cess to fund government-managed rubber replanting schemes, and offered instead an approach led by private sector investment. The cluster also lobbied successfully for liberalization of raw rubber imports to strengthen the competitiveness of rubber manufacturers.

[13] Comments about the original study point to out that this calculation did not take into account the extensive investment of time by private sector participants who developed the cluster strategies and implemented the cluster activities. Tracking sheets compiled by TCI cluster coordinators show that their investment of senior executive time totaled just under $1 million as of November 2003. This brings the project cost to $8 million, which reduces the measured benefit-cost ratio to 8.6.

TCI has provided the government with technical assistance in developing its intellectual property rights (IPR) policy, including helping draft the IPR law that passed in June 2003. A TCI consultant helped to introduce procedures for branding under the WTO TRIPS agreement for geographic indicators. As a result, the tea cluster is pursuing IPR branding for Ceylon Tea through the Sri Lanka Tea Board, and members of the gem and jewelry cluster are establishing the Ceylon Sapphire Council to develop a trademark brand of Ceylon Sapphires.

Two TCI resident advisers provided policy support to the government. One was assigned to the Ministry of Economic Development (MED), which covers six of the eight TCI clusters. The other assisted the Prime Minister and the Ministry of Policy Development and Implementation (MPDI) in developing the *Regaining Sri Lanka* strategy.

Recommendations for Monitoring Economic Impact

Evaluating the economic impact of cluster initiatives is critical to justifying this whole approach to private sector development as an effective use of development assistance. This report helps to fill the knowledge gap, but it is only an interim assessment.[14] Further work is needed to

- ***Refine the estimates*** through consultations with resource persons outside TCI and gather more detailed feedback from the cluster coordinators.
- ***Broaden the estimates*** to include the initiatives outlined in the Other Probable Benefits section. These estimates were excluded because of data and time constraints.
- ***Document success stories*** through case studies that describe the role of the cluster approach, the central factors underpinning the result, the role of technical assistance, and lessons for enhancing the effectiveness of other competitiveness projects.

It would be also be useful to compile more systematic information on the economic impact of initiatives that are less amenable to quantification, such as the activities outlined under Other Possible Benefits. These follow-up activities would provide a richer picture of the impact of the project's overall portfolio of cluster initiatives.

Summary and Conclusions

The cluster approach to private sector development has attracted global attention. Clusters are an important part of the economic landscape in many countries. It makes sense to think

[14] The study was designed to produce provisional estimates on the assumption that a local-hire staff member at TCI would follow up on the analysis. Part of the consultant's responsibility has been to train the staff member for this purpose, and provide guidance on tasks requiring further attention.

that cluster initiatives can foster innovations that contribute to competitiveness and productivity. Another reason for the approach's popularity is that standard prescriptions for macroeconomic stability and liberalization have proved to be necessary but not sufficient conditions for rapid growth. This realization has led to a search for other approaches to accelerate development, such as institutional reforms and microeconomic interventions.

The Competitiveness Initiative in Sri Lanka was one of the early USAID-funded projects to pursue the cluster approach. After three years, one would like to see large, measurable impacts. But experience has shown that it takes time for clusters to gel as effective organizations, to agree on strategic initiatives, and to get activities off the ground. Much of the economic impact of TCI therefore lies in the future. Nonetheless, reasonably sound estimates of the prospective benefits can be obtained for many of the cluster activities that have advanced well beyond the idea stage.

RESULTS

This study defines the economic impact of a cluster initiative as the expected present value of additional net incomes generated directly by the initiative. The analysis is restricted to cluster initiatives that are (1) highly likely to produce results, (2) clearly attributable to the project, and (3) quantifiable with currently available data. Eight activities satisfy these criteria. Using conservative parameter values, these eight activities are expected to yield an aggregate benefit of $69 million after discounting for possible impediments to implementation, and the possibility that similar outcomes could have arisen through other channels. This lower-bound estimate of the economic impact gives a cost-benefit ratio of 10:1 for the portfolio of TCI cluster initiatives. Out of the eight activities analyzed in detail, there are two "jackpots" with yields of more than $25 million. Two other initiatives each have a yield of more than $1 million. Three have a smaller yield. And one has a negative yield in terms of presently quantifiable benefits.

PATTERNS

TCI experience does not suggest any clear lesson about which types of cluster activities are most likely to succeed. Initiatives that are yielding measurable impacts run the gamut, including joint procurement to reduce input costs, development of new markets, upgrading value in existing markets, introduction of new technology, joint investment, expansion of supplies, improvement in the quality of supplies, and supply-chain integration. Even the two big wins in the rubber cluster involve opposite ends of the value chain: one addresses raw material supplies, whereas the other is a product upgrade. The implication is that any project to promote cluster initiatives should avoid limiting the activity set to pre-specified approaches. Here again, the idea of pursuing a portfolio of activities makes the most sense.

The portfolio includes just one quick win joint negotiation for lower LPG prices by the ceramics cluster. But even within the ceramics cluster, technical assistance to identify further savings from joint procurement has not produced results. None of the clusters has put together a joint training program with demonstrable results, though one would expect this to be an important area for cooperation. However, several clusters are pursuing training activities that may pay off in the future. A possible lesson may be inferred from the one activity that has a negative measurable return. This activity is being pursued only because of a government subsidy: the sapphire branding initiative. If clusters become vehicles for pursuing subsidies and protection,[15] the economic impacts can certainly be negative. Still, it would be premature to conclude that the sapphire program is ill advised, because it may prove to be an effective catalyst for the industry to penetrate a valuable and sustainable new market. Time will tell.

SUPPORTING CONDITIONS

Many of the cluster initiatives would have hit a brick wall without supportive government agencies. This is a familiar theme in discussions of aid effectiveness—aid works best in the presence of good policies. In the case of TCI, the cluster initiatives benefited from strong and committed leadership from the government that took office in December 2001, particularly from the Prime Minister and the Minister for Economic Development.[16] This observation has two important implications for competitiveness projects in general. First, cluster initiatives will be much less successful in countries where policymakers are less committed to supporting the progressive private sector. Also, packaging policy-level support with industry-level support may leverage the benefit of both forms of assistance—in countries where the government is serious about supporting the private sector.

PROJECT ROLE

The role of the project extended far beyond convening industry groups. Nearly all of the main impacts emerged from groups plus technical assistance. The technical assistance served as a catalyst for new ideas, a challenge to conventional thinking, a glue to hold the group together, a spotlight on innovation opportunities, and an impetus to action. In short, technical assistance was essential to help the clusters convert deliberations into well-focused plans, actions, and results. At the same time, the cluster approach enhanced the impact of the technical assistance, because of the obvious advantage of supplying ideas, marketing arrangements, and technical information to multiple companies at once.

The danger here is that once the project ends, the clusters may lose momentum and become ineffective. This is a common criticism of aid-supported cluster initiatives. In the case of TCI,

[15] The economic impact will also be adverse if clusters serve as avenues for anti-competitive practices.
[16] This observation was suggested by Lakna Paranawithana, coordinator for the Rubber Cluster.

some groups, like the rubber cluster, have such strong support and leadership that they are likely to maintain momentum through their new apex organizations. Others might wilt in the absence of project support. If so, the flow of new cluster-based innovations for the respective industry would end with the project. Yet the change in mindset among industry leaders can be sustained, as can the economic benefits measured in this study, as long as the innovations supported by TCI are fundamentally viable. For example, once the tea cluster and the University of Moratuwa have developed a low-cost color separator, the benefits of the technology will flow with or without more cluster meetings. The bottom line is that the favorable benefit-cost ratio for the project does not hinge on the sustainability of the cluster organizations as such.

In closing, it may be worth noting that the author of this report is a skeptic about the cluster approach to economic development. Even though the results reported here are reasonably good, there is an astonishing paucity of data on the economic impact of cluster initiatives. As a result, the cluster approach has yet to meet the burden of proof as an effective use of development assistance. To remedy the lack of information and resolve the arguments about the role of competitiveness projects, it is essential to ensure that monitoring and evaluation of the economic impact of cluster initiatives is part and parcel of every competitiveness project.