

A.I.D. EVALUATION SUMMARY - PART I XI

1. BEFORE FILLING OUT THIS FORM, READ THE ATTACHED INSTRUCTIONS.  
2. USE LETTER QUALITY TYPE, NOT "DOT MATRIX" TYPE.

IDENTIFICATION DATA					
A. Reporting A.I.D. Unit Mission or AID/W Office (ES# <u>94-01</u> )		B. Was Evaluation Scheduled in Current FY Annual Evaluation Plan? Yes <input checked="" type="checkbox"/> Skipped <input type="checkbox"/> Ad Hoc <input type="checkbox"/>		C. Evaluation Timing Interim <input checked="" type="checkbox"/> Final <input type="checkbox"/>	
		Evaluation Plan Submission Date: FY <u>93</u> <u>Q 3rd</u>		Ex Post <input type="checkbox"/> Other <input type="checkbox"/>	
D. Activity or Activities Evaluated (List the following information for project(s) or program(s) evaluated; if not applicable, list title and date of the evaluation report.)					
Project No.	Project /Program Title	First PACAG or Equivalent (FY)	Most Recent PACD (Mo/Yr)	Planned LOP Cost (000)	Amount Obligated to Date (000)
386-0507	Centre for Technology Development (CTD)	1989	07/95	\$ 10,000	\$ 5,000

ACTIONS		
E. Action Decisions Approved By Mission or AID/W Office Director Action(s) Required	Name of Officer Responsible for Action	Date Action to be Completed
1. An MRC meeting to discuss the mid-term evaluation recommendations and determine appropriate action on each recommendation.	Manmohan Reddy, TDE	June 15, 1993
2. Senior Mission management meeting with CTD Governing Board members to discuss evaluation findings and methodology to implement the recommendations accepted by the Mission.	Steve Mintz, DD	July 31, 1993
3. Management review by the Mission Private Sector officer	Felipe Manteiga, TDE	Oct. 31, 1993
4. Implementation of the mid-term evaluation recommendations accepted by the Mission and CTD.	R.K. Berry TDE	Dec. 31, 1993
5. Issuance of PIL to redefine the role of ICICI/USAID in proposals' selection/approval process, extend the PACD and revise project elements/components/focus, as appropriate.	R.K. Berry TDE	Jan. 31, 1994

(Attach extra sheet if necessary)

APPROVALS			
F. Date Of Mission Or AID/W Office Review Of Evaluation:	(Month)	(Day)	(Year)
	06	09	1993

G. Approvals of Evaluation Summary And Action Decisions:				
Name (Typed)	Project/Program Officer	Representative of Borrower/Guantee	Evaluation Officer	Mission or AID/W Office Director
	R.K. Berry-TDE	P.C. Nayak-OTD	Jon O'Rourke-PRO	Steve Mintz D(A)
Signature	<i>R.K. Berry</i>	<i>P.C. Nayak</i>	<i>Jon O'Rourke</i>	<i>Steve Mintz</i>
Date	12/17/93	12/17/93		12/27/93

A B S T R A C T

H. Evaluation Abstract (Do not exceed the space provided)

The CTD is an experimental project designed over a three year period and authorized in 1989. Funds became available for implementation in March 1990 after CPs were met. CTD represents an attempt at mobilization of regional technology resources to support regional economic development. The focus is on the state of Karnataka with the potential for adaptation by other Indian states. The project is being implemented by a non-profit society located in Bangalore. This mid-term evaluation was conducted by a five member (Eccles Association, USAID/W and GOI professionals) team on the basis of a review of project documents, interviews with Mission and project personnel and visits to collaborating implementing institutions in and around Bangalore. The evaluation assessed the project in terms of concept, implementation, accomplishments and future directions. The purpose was to determine progress, identify issues and recommend any necessary modifications. The major findings are :

1. The CTD developed principally along the lines outlined in the original project paper. However, CTD concept and mechanism are not well understood by a broad audience.
2. The strength of the CTD process for the mobilization of resources relies on the careful development and nurturing of its industry-academic-government base of contacts. However, a careful balancing of the three sectors does not appear to be fully developed within and across in four focus areas. Industry participation was strong in the early stages but fell overtime.
3. To date CTD achieved several programmatic goals while perhaps falling short of anticipated spending levels.
4. The CTD mobilization process can provide a catalytic role in helping bridge the transition from protected, production-based to an open, competitive market based economy.
5. The use of existing, strong institutions, as done by CTD, is necessary and successful tactic to deliver quick, cost-effective training.
6. CTD should limit the range of areas of activity and focus on enhancing industrial participation and marketing of existing activities.

C O S T S

1. Evaluation Costs

1. Evaluation Team		Contract Number OR TDY Person Days	Contract Cost OR TDY Cost (U.S. \$)	Source of Funds
Name	Affiliation			
Jack L Bishop,	Eccles Associates	386-0507-C	\$ 97,956	Project
Atul Wad, Ph D	-Do-	-00-3132-00		
R. Mahadevan, Ph D	-Do-	22 days TDY	\$ 5,000	OE GOI
Kerri-Ann Jones, Ph D	USAID/W	10 days TDY	N/A	
Y.S. Rajan, Govt. of India,	Deptt. of Science & Technology			
2. Mission/Office Professional Staff Person-Days (Estimate) <u>30</u>		3. Borrower/Grantee Professional Staff Person-Days (Estimate) <u>20</u>		

**A.I.D. EVALUATION SUMMARY - PART II**

**S U M M A R Y**

**J. Summary of Evaluation Findings, Conclusions and Recommendations (Try not to exceed the three (3) pages provided)**

**Address the following items:**

- Purpose of evaluation and methodology used
- Purpose of activity(ies) evaluated
- Findings and conclusions (relate to questions)
- Principal recommendations
- Lessons learned

**Mission or Office:**

**Date This Summary Prepared:**

**Title And Date Of Full Evaluation Report:**

**1. Purpose of the activity evaluated**

The Centre for Technology Development (CTD) project represents an attempt at mobilization of regional technology resources to support regional economic development. The conceptual basis for this mobilization effort lies in the SRI adaptation of a USA model of technology commercialization at a state level. The goal of CTD is the stimulation/acceleration of the pace of technology development and the commercial use of that technology in India. The project has four broad target sectors : food processing, informatics, new materials and dry land development. The project envisioned to develop and coordinate elements of the Karnataka technology infrastructure through the funding of Applied Technology Centers, Human Resources Development and the procurement of a variety of physical and technical resources.

**2. Purpose of the evaluation and methodology used**

The mid-term evaluation was conducted as required by USAID procedures. The purpose included determination of the progress of the project, identification of issues, and recommendation of any necessary modifications. The evaluation assessed the project in terms of concept, implementation, accomplishments and future directions. The evaluation included examination of available documents and records, with heavy emphasis on interviews and discussions in the field and site visits in and around Bangalore. Since CTD works through Focus and Support Groups, evaluation team conducted the reviews of group activities and specific projects as well as overall program.

**3. Findings & Conclusion**

- CTD developed principally along the lines outlined in the PP. It is a process for the mobilization of resources to foster regional economic growth through technology development and use. CTD successfully initiated this mobilization. However, CTD concept and mechanism are not well understood by a broad audience. There is a need for the simple presentation or documentation of the program.
- CTD established a working structure, contracting procedures for equipment and services procurement. However, this differs from the structure envisaged in the PP. Proposals reviewed did not explicitly consider the criteria listed in the PP. The proposals appear to be

solicited by the Focus Groups who then evaluate, approve and review results.

- CTD established an innovative resource mobilization process for technology development and use. CTD has developed networks which integrate private sector leaders, academicians, and senior public sector officers. It has developed a strong focus on human resources training and has leveraged resources from existing training institutions. To date CTD has achieved several programmatic goals, while perhaps falling short of anticipated spending levels. Some of the specific accomplishments include the following :

- o Development of academic/industry linkages and networking;
- o Significant Human Resource Development through technician training by established institutions;
- o Procurement of equipment to further CTD's mission and leveraging of CTD/USAID resources with in kind contribution of land and buildings;
- o Support of women Entrepreneurial program (AWAKE) as potential source for new venture development; and
- o Initial steps to test replicability through efforts in Kumaon, Pune and Anna University, Madras.

- A number of Applied Technology Centers (ATCs) and similar activities are on the drawing board, often without consistent background development. An Analytical Quality control laboratory is in operation as the first segment of a planned decentralized Center for Processed Foods. The greenhouse/mist chambers/tissue culture laboratory form the basis for the creation of a Center for Elite Trees.

- The informal approach to need assessment, project definition, proposal development, proposal review and results monitoring that CTD appears to follow, makes impact measurement and replication difficult. Replicability needs a solid and well structured foundation as a point of reference. To achieve institutional/process sustainability on the current climate, CTD must be established and run as a high profile business driven for impact and success.

#### Principal Recommendations

- o CTD should retain a full time experienced Associate Executive Director with full responsibility to manage operations.
- o Replication of CTD should be delayed until the conceptual and management concerns with Karnataka activity are addressed and implemented.
- o CTD should enhance its public relations and promote project concept and objectives with the industry and general public.

- o CTD should integrate support group activities of human resource, buyer-supplier, venture capital, gender and environmental aspects into all the Focus Groups.
- o CTD should strengthen the proposal approval process and document the approval and/or rejection of each proposal according to the criteria laid out in PP. USAID should get an advance copy of the proposal for review and concurrence before its formal approval by the CTD.
- o USAID should provide counsel to CTD to steer the project more towards its original goals and address some of its shortcomings immediately. This may result in the need for a PACD extension.
- o USAID representatives should attend CTD Governing Board and Executive Committee meetings in order to provide on going counsel relative to strategic issues of implementation of the CTD resource mobilization process.

#### Lessons Learned

- o The key to successful mobilization of resources for technological development and use is strong leadership; in the CTD, senior officials put their reputations on-the-line for program development.
- o Personal, informal networking is an important mechanism for the mobilization of resources for technology application;
- o Programs to develop relationships with private industry must be responsive to their needs and include fast approval cycles;
- o The effective leverage of resources with strong partners may deliver quick results, but a concomitant strong public relations effort is necessary to create a sustainable organization.

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ATTACHMENTS

K. Attachments (List attachments submitted with this Evaluation Summary; always attach copy of full evaluation report, even if one was submitted earlier; attach studies, surveys, etc. from "on-going" evaluation, if relevant to the evaluation report.)

1. Mid-term Evaluation Report
2. Issue paper for Mission Review Committee (MRC) meeting
3. Minutes of MRC meeting held on June 9, 1993
4. Mission talking points for meeting with CTD senior management.
5. Progress Review on the Action Plan for implementing the evaluation recommendations.

COMMENTS

L. Comments By Mission, AID/W Office and Borrower/Grantee On Full Report

Mission believed that it was a good and comprehensive evaluation of the project. The evaluation has validated the concept that the resource mobilization process initiated by CTD is playing a catalytic role in helping bridge the transition from protected, production-based to an open competitive, market-based economy and also pointed out that flexible design, as was the case in CTD, normally demands tight implementation monitoring or the project's flexibility may lead to resources dilution by micro-initiatives which fail to create a critical mass or sustainability. Mission has, in general, agreed with the evaluation recommendations and initiated action to implement these. Senior Mission management communicated evaluation findings and principal recommendations to the CTD Governing Board members in a meeting held on July 14, 1993. An Action Plan to implement the major recommendations was jointly drawn up by the USAID project officer and CTD Honorary Director with responsibility for each action and target dates. A subsequent management review and field assessment done by TDE Deputy Office Director (Private Sector) confirmed evaluation findings and the wisdom of Mission's proposed action in implementing the evaluation recommendations.

X-ABH-120-1  
1993/01

**United States Agency for International Development**  
New Delhi India

**Mid-Term Evaluation**

**CENTRE FOR TECHNOLOGY  
DEVELOPMENT**  
(CTD 386-0507)

**EXECUTIVE SUMMARY**  
&  
**PROPOSED  
SHORT-TERM ACTION PLAN**  
for  
**MID-COURSE CORRECTION**

May 2-28, 1993

Mid-Term Evaluation Team  
Eccles Associates - New York  
Bishop - Jones - Rajan - Mahadevan - Wad

Summary & Plan - 1

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**EXECUTIVE SUMMARY**  
and  
proposed  
**SHORT-TERM ACTION PLAN**  
for Mid-Course Correction

**I. PROJECT DESCRIPTION**

The Centre for Technology Development (CTD) represents an attempt at mobilization of regional technology resources to support regional economic development. The conceptual basis for this mobilization effort lies in the SRI adaptation of a USA model of technology commercialization at a state level.

The Centre for Technology Development is an experimental project designed over a three year period and authorized in 1989. Funds became available to the project in March 1990 after the conditions precedent were met. The goal of the CTD is the stimulation / acceleration of the pace of technology development and improvement of product / process technology development and application and commercialization in both existing and new businesses in Industry, Health, Agriculture and other areas important to Indian development.

The CTD's focus is the state of Karnataka, with the potential for adaptation by other Indian states. The CTD was envisioned to develop and coordinate elements of the Karnataka technology infrastructure through the funding of Applied Technology Centers, Human Resources Development, and the procurement of a variety of physical and technical resources. CTD's activities were to be conducted through a structure of industry / academic / government panels (Focus and Support Groups), with administrative support provided by a Secretariat.

**II. PURPOSE of the EVALUATION and METHODOLOGY USED**

This standard mid-term evaluation, was conducted as required by US AID procedures. The evaluation assessed the project in terms of concept, implementation, accomplishments, and future directions. As a mid-term evaluation, its purpose included determination of the progress of the project, identification of issues, and recommendation of any necessary modifications. As CTD works through Focus and Support Groups, reviews of group activities and specific projects as well as the overall program were conducted. The major evaluation issues addressed were based upon the experimental and evolving nature of the CTD project and the understanding and appreciation of the nature, process, and results of the project.

The evaluation included examination of available documents and records, with heavy emphasis on interviews and discussions in the field and site visits in both New Delhi and Bangalore. The evaluation team reviewed both what was done and what was not done in order to determine the priorities and focus of the project and the accomplishments to date. Interviews and site visits were conducted with a range of participants and interested parties.

Documents from both US AID - New Delhi, and CTD in Bangalore were evaluated.

Particular attention was directed to the measures of performance described in the project paper both for the project as a whole and its subsidiary activities. The measures of performance reveal the philosophical position of the administering boards and set the operational direction for the activities of the project.

Evaluations were conducted of Focus and Support groups. In addition, selected case histories and anecdotal information was used to ensure that the purposes and results of the program are comprehensible to both a technical audience and the general public.

### **III. FINDINGS & CONCLUSIONS**

#### **A. Conceptual Understanding**

The CTD developed principally along the lines outlined in the original project paper. The CTD is a process for the mobilization of resources to foster regional economic growth through technology development and use. CTD successfully initiated this mobilization.

At a conceptual level, the evaluation team found a general lack of understanding and appreciation of the CTD which, in turn, generated specific concerns regarding the goals and purposes, operations, management, outputs, establishment of subsidiary centers, replicability and sustainability, stewardship of US AID resources, future plans, and gender considerations.

However, the nature of the mobilization was originally envisioned to be industrially-driven, market-oriented and targeted. Maintenance of these qualities was neither strong nor consistent. Variations are seen among Focus Groups based on their composition.

The CTD concept and mechanism are not well understood by a broad audience. The message evolved over time. A simple presentation or documentation of the program was not available to provide a reference point for either the CTD or its publics. The need for such a clear statement of purpose is especially important as CTD communicates cross culturally - with industry, finance, academe, and government.

#### **B. Functioning of CTD**

CTD established a working structure, contracting for equipment and services. CTD operations (including planning, proposal development, proposal evaluation, funding mechanisms, and monitoring) differ from the structure envisioned in the Project Paper, often substantially. The initial requirement for no USAID funding for administration may have set a tone of *resource minimization*, rather than *results maximization*, that affected the entire thrust of the CTD process. In an effort to minimize bureaucracy and concentrate resources on project implementation, the project design subtly may have been significantly counterproductive.

### 1. Management:

The strength of the CTD process for the mobilization of resources relies on the careful development and nurturing of its industry - academic - government base of contacts. Careful balancing of the three sectors does not appear to be fully developed within and across in the four Focus Groups. Industry participation was strong in some Focus Groups in the early stages, but fell over time. In addition, the process of proposal initiation, development, approval, and monitoring falls short of several standards of good practice and leaves the operation vulnerable to assertions of alternative agendas.

ICICI is established as an intermediary agency to support the operation of CTD. The team received reports that ICICI's interest in the CTD activity waned. The changes in operation required to renew ICICI's concern for the success of the CTD project is an important agenda item for the CTD Board of Governors.

### 2. Proposal Development & Review

Focus Groups are responsible for proposal development, ensuring that nine essential criteria are included in proposal recommended for approval:

- 1) Overall economic rationale
- 2) Market demand
- 3) Structure & Organization
- 4) Business Participation
- 5) Institutional Autonomy
- 6) Use and Adaptation of Existing Technologies
- 7) Utilization of "Best Practices"
- 8) Intellectual Property Rights
- 9) Environment / Health.

None of the proposals evaluated explicitly considered these required criterion.

The review process is to include approval by the Secretariat and Board, with administrative and program review by US AID. In practice, proposals appear to be solicited by the Focus Group who then evaluate, approve, disseminate funds, and review results.

The explicit philosophy of CTD is a focus on supporting successful initiatives. Given the twin imperatives of recognition of economic reform to open markets and the project focus on Small and Medium Enterprises (SMEs) and business development, such a focus needs to be examined. The characteristics of enterprises that were successful in the past may provide a poor indication of future success at a time of paradigm shift as may be in process in India of the 90's and beyond. Certainly, one would not be surprised to see a portfolio approach to development in a program such as CTD. Some investments of resources with past success on the assumption that management is sufficiently resilient and adaptable to meet the changes currently spreading in the world economies. Other resources would be placed to back new, aggressive approaches to economic development. Since government and other traditional sources of support could be counted on to continue to support the established, successful operations, a case can be made that CTD should concentrate its resources in new and

Innovative mechanisms as well as new technologies.

### **C. Achievement of Designed Outputs and Purpose**

The establishment of an innovative resource mobilization process for technology development and use is in process. This process, moreover, takes advantage of significant experience and judgement of retired members of the military and the Indian Administrative Service. To date, the CTD achieved several programmatic goals, while perhaps falling short of anticipated spending levels.

Specific accomplishments include the following:

- 1) Establishment of the CTD process of resource mobilization;
- 2) Development of academic / industry linkages and networking;
- 3) Procurement of equipment to further CTD's mission and leveraging of CTD expenditures for equipment with in-kind contributions of land and buildings;
- 4) Significant Human Resource Development through technician training by established institutions;
- 5) Initial formation of an organizational structure and establishment of budgetary and accounting procedures;
- 6) Implementation of a portion of the first Applied Technology Centers through an Analytical Quality Control Laboratory (Center for Processed Foods ATC) and greenhouse / mist chamber / tissue culture laboratory (Center for Elite Tree ATC);
- 7) Support for the Women's Entrepreneurial program (AWAKE) as a potential source for new venture development;
- 8) Initial steps to test replicability through efforts in Kumaon, Pune, and Anna University (Madras);
- 9) Continuing attempts to raise external funds and thus develop sustainability;
- 10) Development of New Materials including support for a CPRI pilot plant to produce a methyl ester of rape seed oil for use as capacitor fluid, development of a COMPAC facility at NAL for development of composites and training;
- 11) Development of a baseline survey in software as well as implementation of training in CAD/CAM, PC awareness, and other software use training and modest efforts in other areas.

Continuation of the current and planned direction of the CTD will make it difficult to achieve a number of basic outputs required by the programs. Specifically, the slow development of the ATC process and Small and Medium- Sized Enterprise (SME) orientation will make new venture, sustainability, jobs, and SME development difficult to achieve.

### **D. Applied Technology Centers, New Ventures and Start-up Firms**

A number of Applied Technology Centers and similar activities are on the drawing board, often without consistent background development. An Analytical Quality Control Laboratory (AQCL) is in operation as the first segment of a planned decentralized Center for Processed Foods (CPF) including Fruit & Vegetable Processing, Packaging, and Feeder Processing facilities. The greenhouse / mist chamber / tissue culture laboratory form the basis for the

creation of a Center for Elite Trees (CET). A Mission and Scope Study (MSS) was developed early in 1993 as the basis for the creation of a Center for Manufacturing Engineering (CME), but a similar planning process does not appear to have been codified to provide the basis for the development of either the Center for Processed Foods or the Center for Elite Trees.

Neither new ventures nor start-up firms can be identified with the activities of the CTD, save indirectly through the support for the women entrepreneurs AWAKE program and, to some extent, through NEC & GTTC.

#### **E. Replicability and Sustainability**

The informal approach to Need Assessment, Project Definition, Proposal Development, Proposal Review, and Results Monitoring that CTD appears to follow, through advantageous to efficient operations, makes replication difficult. Replicability needs as solid and well-structured foundation as a point of reference. Until and unless policies and procedures are developed as recommended (below), the CTD program can be replicated only through established personal networks. Such a replication is more an extension of the current program than replication of a successful template. Therefore, the steps to replicate the current CTD process in Kumaon *et al.* begs the question as to why this is desirable at this point when efforts need to be focused on core activities in Karnataka.

To date, CTD resource mobilization process was unsuccessful in gaining significant external funding support from other donor agencies. The lack of commitment of venture funds to date indicates a low likelihood of gaining sustainability from investment funds. Without business plans (including financial projections) for the CTD and its various components, the CTD activity must be viewed as nonsustainable in its present form.

The question "Should the CTD process be sustained?" cannot be ignored as a policy issue, both for USAID and the Karnataka community. USAID's original implied desire to avoid the creation of a bureaucracy, together with the apparent minimum cost and low profile approach of CTD, creates an environment in which *sustainability* is neither a goal nor a realistic outcome. At the same time, the Project Paper does not define the nature of sustainability, either as an institution or as a barrier reduction process.

To address the feasibility of sustainability as an ongoing institution / process, CTD should recognize three potential supporters of its activities: customers (service fees, royalties, return of equity), governments (grants), and / or business (grants or investments). Without an aggressive definition of specific competency, the ability to attract government funding in the future cannot be expected to materially deviate from experience. Without a program redirection and reinvigoration to target investment and aggressive fee development, significant support from investees will not materialize. The development of a successful program stands the chance of gaining business investment, as a "window on technology," for potential acquisitions by existing firms, but not without demonstrated success in business development. Therefore, to achieve institutional / process sustainability in the current climate,

CTD must be established and run as a business... a high profile business driven for impact and success.

The sustainability of the CTD resource mobilization process can be viewed at the level of barrier reduction. By this measure, the CTD process is sustainable post-funding, if the barriers between university / institute and industry permanently are reduced / removed and a natural organic process of interaction remains in place. By this measure, the CTD process is not yet sustainable, due to the modest participation of industry in the CTD process to date. The achievement of such sustainability may require adding another dimension to the university / institute culture, requiring professors / researchers to add a new, unfunded agenda item of industrial interaction to their current full agenda of primary goals. Concurrently, industry might be expected to devote additional resources to contribute to academic agendas without an immediate return. While the experimental nature of the CTD resource mobilization process may be able to test this assumption, the challenge of meeting this level of sustainability may be more difficult both to accommodate and measure than the requirements for financial sustainability.

#### **F. Use of US AID Resources**

Financial audits ensure that proper accounts of expenditures are in place. The lack of documentation on project development and approval, specifically the failure to apply the required nine criteria, raises programmatic evaluation questions in regard to stewardship of resources in the sense of program effectiveness.

Significant US AID funds were used in the purchase of computers (hardware and associated software) and machine tools for academic and training institutions. In those cases where CTD provided equipment that clearly was needed by the organization (e.g. NEC, GTTC, AWAKE), its positive role is quite clear. In some cases it was unclear if the equipment provided to a specific unit in an institute was in fact a priority for the institute as a whole (e.g. UAS).

The proposed Action Plan for Mid-Course Correction (following) provides a two month plan to bring CTD activities into compliance with programmatic requirements and guidelines. The plan balances the need to take decisive action with the desire not to immobilize CTD at a critical time. CTD is embarked on a significant ramp-up of expenditure levels. To halt all spending pending development of the basic *raison d'être* for each project under development runs the risk of killing the program. Conversely, to approve disbursement for projects that do not meet programmatic requirements is contrary to prudent project management. The team proposes the two month period to minimize disruption with the assumption that TA funds will be programmed to ameliorate the required documentation on existing projects in priority of approval needs to minimize disruption either of momentum or project direction. Significant judgement will be required, both from USAID and CTD, to ensure that certain critical components are not sacrificed to ensure a complete file or make a public point of protest. Where the two month period to turn into six months, the team believes that the CTD experiment may be terminated, with death attributable to bureaucracy, therefore the pace of implementation is believed to be critical.

### **G. Gender Considerations**

While a few training programs are set up for women, the participation of women in the direction of the CTD, from its Focus and Support Groups to the recipients of CTD funds, is lacking. Little evidence was found to suggest that the proactive gender-sensitive issues were addressed. The notable exception is the support for the women's entrepreneurial development program (AWAKE), an incubator for the development of woman-based businesses. This initiative could serve as a model and stimulant for other gender-focused activities. CTD aggressive support for the development of SMEs provides a vehicle for positive development of a gender-sensitive initiative.

### **IV. LESSONS LEARNED:**

- 1) The key to successful mobilization of resources for technological development and use is strong leadership; in the CTD, senior officials put their reputations on-the-line for program development.
- 2) Personal, informal networking is an important mechanism for the mobilization of resources for technology application;
- 3) The use of existing, strong institutions is a necessary and successful tactic to deliver quick, cost-effective training;
- 4) The CTD mobilization process can provide a catalytic role in helping bridge the transition from protected, production-based to an open, competitive, market-based economy;
- 5) An innovative, informal, and flexible structure can accomplish results, e.g. the training program of the CTD, in the short- and medium-term. In the long-term, a solid organizational foundation is needed. Such a solid foundation need not be bureaucratic.
- 6) Programs to develop relationships with private industry must be responsive to their needs and include fast approval cycles;
- 7) Given the reported inherent nature of the Indian bureaucracy, equipment procurement and technical assistance may be more effectively carried out through independent entities (e.g. the ATCs). Consistent with good business practice, blanket approvals by CTD to such entities therefore may be advisable;
- 8) The effective leverage of resources with strong partners may deliver quick results, but a concomitant strong public relations effort is necessary to create a sustainable organization.

## V. RECOMMENDATIONS:

The following recommendations are conceptual and programmatic in nature and include short-term administrative and business issues, as well as, long-term support necessary to develop and maximize the impact of the CTD project. ~~These recommendations are conceptual and programmatic in nature and include short-term administrative and business issues, as well as long-term support necessary to develop and maximize the impact of the CTD project.~~ The recommendations by the evaluation team are with the belief that the CTD initiative is worth efforts to ensure it is "on track" and that the experiment be given the necessary latitude to determine its full potential. *Note: The following recommendations are listed in order of priority in each category.*

### A. Concept:

- 1) CTD and US AID should agree to a simplified and concise statement of project. The team proposes the following project statement: **A mobilization of regional resources for technology development and use, in a limited number of focused areas, for maximum impact.** differs from factor  
Elia
- 2) Representatives in responsible operating positions in private and public industry should form the majority in CTD Focus Groups.
- 3) CTD Board should retain and empower a full-time, experienced Associate Executive Director with full responsibility to manage operations. To fund this position, USAID reprogram certain funds (e.g. \$100,000) as an endowment, with interest earmarked for the costs of such Associate Executive Director, including administrative assistant. This position is recommended to ensure implementation of the Mid-Course Correction Action Plan. can endow?
- 4) CTD must make the support and development of private sector industry its prime focus and incorporate it into their basic operating philosophy. Strengthening of existing private sector initiatives must have a priority over the creation of new public sector institutions.
- 5) CTD Board should determine the requirements of external funding agencies to consider restructure the CTD mobilization process philosophy and / or operations in order to attract significant external funding and attain sustainability for the mobilization process.

### B. Administrative and Business Practice:

#### Strategic:

- 1) CTD management should provide US AID with succinct strategic, tactical, and budgetary plans as envisioned in the project paper.
- 2) US AID should support CTD in developing measures of performance for the mobilization process and subsidiary operations that will drive operations to achieve project goals.

- 3) CTD should limit the range of areas of activity, focusing on enhancing industrial participation and marketing of existing activities
- 4) Replication of CTD should be delayed until the conceptual and management concerns with the Karnataka activity are addressed and implemented.
- 5) CTD should enhance their public relations and publicize their project concept and objectives to the industry and general public. It is suggested that CTD utilize technical assistance to ensure that this is done in the most professional manner. This will enhance CTD's effectiveness at bringing industries, institutions, and external funding agencies together.

Operational:

- 1) Project commitments and dispersement should be curtailed until US AID and CTD develop a revised logframe and expected outputs. In other words, US AID should provide CTD counsel to steer the project more towards its original goals in some areas and address some of its shortcomings immediately. See "Short-Term Action Plan for Mid-Course Correction, 21 May 1993, Mid-Term Evaluation team." This Action Plan may result in the need for a project extension. Given the presence of a sound structure at this time, impact results should be observable in 3-5 years, and such a project extension should be considered.
- 2) US AID should provide management counsel and support to enable the potential of the CTD mobilization process to be achieved. This counsel should include application of general program requirements to individual projects, strategic and tactical oversight on program development and resource deployment, development of specific measures of performance for projects, conceptual aid in developing monitoring mechanisms.
- 3) CTD should increase the technical resources available to them on a regular basis in order to strengthen the process of evaluation of proposals, subsequent monitoring of projects, and to keep track of interrelated activities. US AID should reprogram certain funds as required to ensure the one-time ability to put such systems in place.
- 4) CTD should modify their organizational structure to integrate support group activities of human resource, buyer-supplier, venture capital, gender, and environmental aspects into all the Focus Groups. The concept of Support Groups should be dropped, except as a vestige of *ad hoc* meetings, e.g. venture capital that service all Focus Groups. CTD also should develop and implement a mechanism to communicate program goals and operations through an iterative process with the focus groups and integrated support group. Effective managerial and technical documentation is one important aspect of this process.
- 5) US AID and CTD should review and simplify the approval cycle procedures within CTD, ICICI, and US AID to respond to proposals in an expeditious manner. CTD

should approve and implement proposals quickly to maximize the opportunities for private sector involvement.

Reporting:

- 1) CTD and US AID should modify and implement reporting requirements to reflect the special nature of the CTD mobilization process.
- 2) CTD must develop and implement record keeping and reporting mechanisms to provide project level and aggregate reporting in a timely and consistent manner. Data about the CTD project, focus groups, support groups, individual projects, budget, and actual spending should be available. For this purpose, CTD is advised to hire a full-time manager with considerable project management experience to implement.
- 3) CTD must develop and implement independent reporting and monitoring programs to track independent entities such as NALTECH and CPF that are created. This monitoring and reporting should ensure that they do not compete with existing private industry and ensure the entities long term beneficial effects.

If the CTD Board of Governors and Executive Committee do not concur in some set of corrective actions along the lines of the recommendations above, the evaluation team leader recommends that USAID give serious consideration to an alternative Action Program directed to the orderly immediate termination of the CTD experiment in the mobilization of technical resources to support regional economic development.

**VI. Team**

The evaluation team is based on Eccles Associates professionals and includes Jack L. Bishop, Jr., Ph.D., Kerri-Ann Jones, Ph.D. (US AID, Washington DC), Atul Wad, Ph.D., Ramaswamy Mahadevan, Ph.D., and Y. S. Rajan (TIFAC). This multi-specialist team provides extensive experience in technology development and commercialization in a variety of developed and developing country settings.

*Note: CTD is a complex project with numerous activities and variable documentation. The evaluation based its findings on as extensive a document review and interview schedule as possible. Verification of all information and follow-up interviews were not possible. Unintentional inaccuracies may exist, but the team believes that substantive issues raised in the evaluation are not compromised.*

**CENTRE FOR TECHNOLOGY DEVELOPMENT**  
proposed  
**SHORT-TERM ACTION PLAN**  
for Mid-Course Correction

**I. ACTIVATE and RECONSTITUTE CTD's GOVERNING BOARD**

a) Start: Day 1 End: ongoing  
The Governing Board should reassume the authority delegated to the CTD Executive Committee.

b) Start: Day 1 End: Day 60  
The Governing Board should appoint a three member advisory team with USAID counsel. The team should consist of two representatives from private sector industries and one professional manager with technical and business project management experience. The team is expected to provide an advisory role to CTD during the transition period and is necessary to provide quick execution of corrective actions.

c) Start: Day 1 End: at hire  
The Governing Board should appoint a search committee to hire a permanent, professional, Associate Executive Director. (Details of qualifications required are given below.)

d) Start: Day 1 End: Day 60  
The Governing Board should be reconstituted to provide parity of membership to representatives from private sector industries. Members selected should be currently active in the private sector and be willing to play an active role in the CTD's governance.

**II. PROFESSIONAL MANAGEMENT**

a) Start: at hire End: ongoing  
The Governing Board should retain and empower a full-time, professional Associate Executive Director to administer CTD and its activities.

b) Start: Day 1 End: ongoing  
USAID should requisition funds for this purpose. In addition, USAID should consider providing technical assistance until the post is filled.

The qualifications required for the Associate Executive Director include:

- project management experience in industry, preferably in the private sector;
- independent, resourceful, and forceful, action-oriented and diplomatic;
- familiarity with technology management;
- international experience in technology and business matters;
- excellent communications and interpersonal skills;
- willing to travel.

### III. STRATEGY & ACTION PLAN

a) Start: Immediately End: Day 60  
Minimize all project related disbursements pending execution of Mid-Term Correction Action Plan.

b) Start: Day 5 End: Day 10  
CTD and USAID should clarify the project paper and revise the logframe to reflect these clarifications. A simple, concise project statement that could be used as a basis is:

*CTD is a process of resource mobilization  
- financial, human, and technical -  
focused on technology development and use at the regional level.*

c) Start: Day 10 End: Day 20  
CTD should establish an action plan to approve the revised logframe with USAID and implement same.

### IV. TRACKING, REPORTING, MONITORING

a) Start: Day 5 End: ongoing  
CTD should compile a single-page checklist with the nine criteria listed in the Project Paper for every CTD activity / project. This should be used to ensure that all the criteria are applied to any proposed or current activity. Retroactive application to all current projects (status: by Day 15; completion: by Day 60).

b) Start: Day 20 End: ongoing  
Monthly report (maximum one - two pages) of CTD process, progress in activities, budgetary information, and impact using measures discussed below, (in the baseline description)

c) Start: Day 20 End: ongoing  
CTD staff should develop a simple database that includes information on the following:

- CTD process
- budgetary information
- project/activity information
- focus groups and proposals

The database should be capable of providing aggregate information on projects, focus groups, ATCs, support group areas, and impact.

Outside technical assistance and/or funds should be provided as needed.

(d) Start: Day 10 End: ongoing  
Track and report the process for proposals and results for external funds and the amounts of funding obtained. This is required to help make CTD a self-sustaining operation.

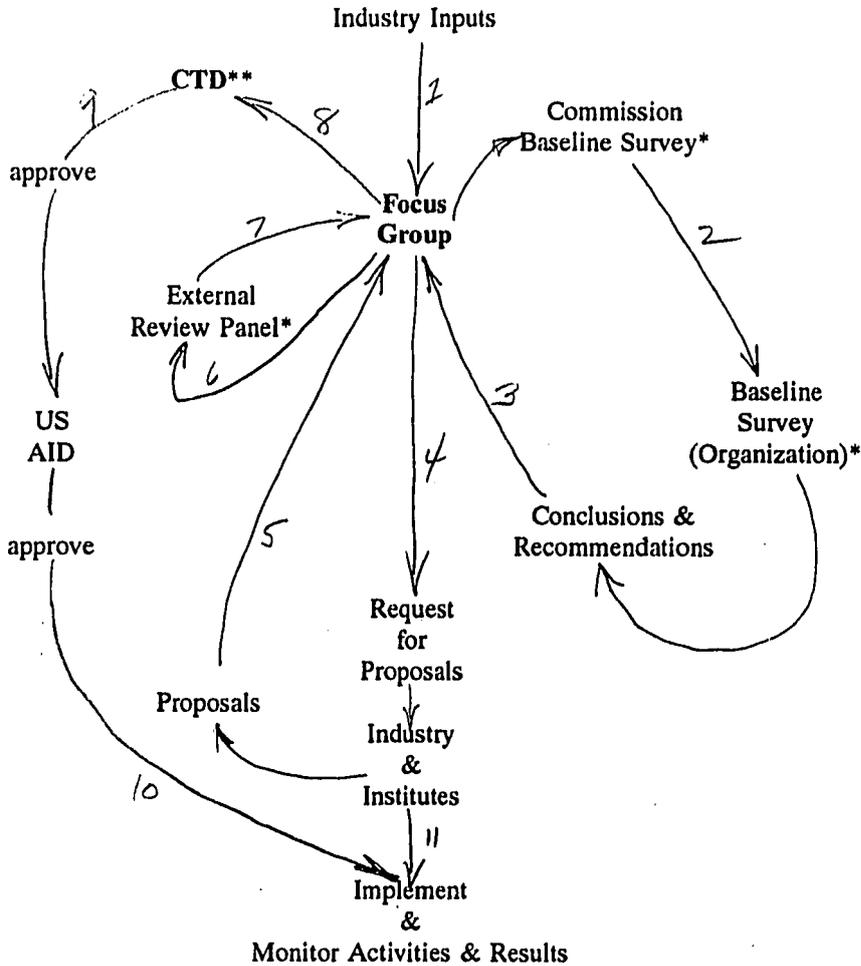
**V. CTD ORGANIZATION and OPERATIONS**

(a) Start: Day 20 End: Day 60

Integrate support groups into all focus groups; i.e. HRD, BSDI, VC, INF aspects should be considered in the focus groups themselves.

(b) Start: Day 1 End: ongoing

Proposal development and review process should be modified to reflect the following flow:



- \* Technical Assistance funding provided
- \*\* Governing Board / Approval Authority

c) Start: Day 20 End: ongoing  
Baseline Survey should include the following information for the specific technology area/ market/industry of interest

- sales/revenue/production
- number of jobs/employees
- product range; number of new products
- investment
- R&D or Development as a percentage of sales
- average wage relative to regional averages
- investment per employee
- investment to sales ratio
- capital expenditure to sales ratio
- quality
  - product price margin
  - rejection rate; scrap rate
  - market share
- technical employees to total employees ratio
- skilled employees to unskilled employee ratio
- number and age distribution of firms / enterprises

Note: Technical assistance and / or funds should be provided to conduct Baseline Surveys

d) Start: Day 30 End: ongoing  
CTD should increase public awareness of its existence and goals. Outside technical assistance and / or funding should be used as necessary.

Prepared by

Eccles Associates  
Mid-Term Evaluation team

28 May 1993

**United States Agency for International Development**  
New Delhi India

**Mid-Term Evaluation**

**CENTRE FOR TECHNOLOGY  
DEVELOPMENT**

(CTD 386-0507)

May 2-28, 1993

Mid-Term Evaluation Team  
Eccles Associates - New York  
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## PREFACE

The development of the Centre for Technology Development is based on the concept of technology-based economic development at the regional level. With references to programs in the individual states of the USA, this concept receives articulation from both ADLittle and SRI International.

ADLittle put regional economic development in a technology context:

*The concept is based on four premises, which, simply states are,*

- *Achievement of national economic development goals can be greatly supported by an effective technology development process;*
- *The technology development process can be effectively enhanced on a local or state level;*
- *The State of Karnataka, for one, has the prerequisites for creating an effective state-level technology development program; and*
- *The United States Government, through USAID, can play an instrumental role in support of this effort. (Arthur D. Little, Inc., Technology Development on a State Level Focused on National Goals, New Delhi, April 1987, p.1.)*

The experiences of industrialized country development were summarized by ADL into two lessons:

1. *A state or local level in technology development may be more effective than one which is nationwide. This is because: (a) the process depends heavily on face-to-face communication; (b) shared physical resources are more readily provided in a small geographic area; and (c) commitment to the process is frequently greater when the ties are closer to home.*
2. *Effective technology development is usually a collaborative effort by a variety of institutions in the public and private sectors. In the United States these include government agencies, public executives, legislative bodies, public and private universities, national laboratories and other special research institutions, large industrial corporations, small to medium-sized industries and industry associations, banks and other financial institutions. (ADL, op.cit., p.8).*

The US experience was used to develop the following ...basic principles and objectives upon which a composite regional model is built...

- *A critical mass of talent, financing, facilities and leadership is necessary for self-generating growth. Achievement of this critical mass must be a major objective of the technology strategy.*
- *Universities are a major source of the intellectual capital and the imaginative ideas from which technological innovation is derived. A strong university provides these resources as well as a nucleus around which a critical mass can accumulate.*
- *While basic research and the activities in university laboratories are vital, the needs of industry must be the primary concern of technology development strategies.*
- *Areas should play to their technical and economic strengths when selecting a direction for technology development. This requires careful assessment of the assets and liabilities and a well designed process for improving the former and muting the latter.*

- *The most effective strategies are opportunistic and much of the growth is dependent on individual actions. Leaders and planners who know which activities can leverage scarce resources can make a significant difference. This, in turn, depends on good information and the ability to act quickly and in a coordinated way.*
- *These programs are most effective when activities are market-driven within a competitive environment. (ADL, loc cit., p.9).*

On the other hand, SRI applied a product life cycle approach to regional economic development, stressing comparative advantage and the creation of an infrastructure plan. This infrastructure plan consists of Technology, Human Resources, and Finance components. The SRI sets high priority for the creation of an applied R&D center to respond to the technology needs of Karnataka's industries and a *buyer - supplier* initiative focusing both on technology and on human resource needs of Karnataka's industries. The development of an applied R&D center draws on the USA programs in Michigan, Ohio, and Pennsylvania for models of the implementation of alternative approaches. The development of a buyer - supplier initiative does not refer to an applied model, but recommended at two stage process including assessment of supplier structure and organizational development. (SRI International, Karnataka in Transformation, New Delhi, November 1987).

Both paradigms provide the basis for the development of the Centre of Technology Development program, based on a USA regional model. Both recognize explicitly the need for a dynamic, personal leadership component of a technology mobilization process. With this conception, amplified in the Project Paper,

## **I. PROJECT DESCRIPTION:**

The Centre for Technology Development is based on an ADL / SRI models of technology mobilization for regional economic development developed from the USA experience at the state level.

The USAID Project Paper states that the purpose of the Centre for Technology Development (CTD) project is:

*To stimulate the process of technology development and commercial use of that technology in India... This purpose will be achieved by providing support to develop and coordinate element's of the region's technology infrastructure through the funding of:*

- 1) Applied Technology Centres (ATCs),*
- 2) Human Resource Development (HRD),*
- 3) the procurement of a variety of physical and technical resources.*

The CTD was established during the project definition process as a non-profit independent society to facilitate the achievement of the project purpose. The Project Paper envisioned the development of a self-sustaining CTD deriving revenue from activities and business investments (venture capital) as well as from other donors and its membership. The CTD was to identify and support efforts to improve Karnataka's ability to use technology to develop products and improve product processes. Several Focus / Support Groups are a critical element of CTD's function, driving it to be industry oriented and driven by business demand. Through strong representation in the Focus and Support groups, industry was to have its voice and express its needs. Completed proposals were to be evaluated by the Focus Groups and submitted to the Secretariat, the Governing Board, and USAID / New Delhi for review and approval. The Project Paper envisioned the creation by CTD of several Applied Technology Centres (ATC) for applied research, product and process development, and *one-stop shopping* for the development of SMEs, a primary target of the CTD process.

## **II. PURPOSE of EVALUATION and METHODS USED:**

As the CTD project reaches its third anniversary, a standard mid-term evaluation is scheduled to compare the envisioned mechanism with results to date and provide recommendations for future action.

The mid-term evaluation assessed the project in terms of concept, implementation, accomplishments, and future directions. The purpose of the evaluation includes the determination of progress, identification of issues, and recommendations of any necessary modifications to either design or implementation. The Focus and Support Groups, as key aspects of the design, received specific attention through review of both group activities and specific projects. Similarly, the progress in defining and establishing Applied Technology Centres (ATCs) was assessed in the context both of the project goals and the special circumstances of implementation.

The evaluation took into account the experimental and evolving nature of the CTD project,

with an appreciation for the special characteristics of such an endeavor. Since support for SMEs is another key aspect of the project, the degree to which the CTD program has promoted the establishment and growth of new ventures was reviewed.

The evaluation also provides specific recommendations to be used in developing program modifications for the remaining life of the project funded by US AID. The evaluation includes consideration of deauthorization of some of the appropriated funds remaining for the CTD project as well as enhancement of funds to accomplish project goals.

The key to the evaluation is placing the operations of the CTD in the context of the philosophical construct of technology development and commercialization. The evaluation is developed to address both specific programmatic issues and those in the context of the larger agendas of which CTD is a part.

The evaluation of activities of institutions such as CTD in the Indian context is a complex task as the judgements need also to consider the world-context. One of the major purposes of this experimental project funded by USAID is to stimulate market-driven technology development and to provide linkages for eventual commercialization. Factors in the Indian context to be taken into account are:

1. When CTD started the project, most industrial activity in India was under the control of the central government in Delhi through an extensive program to license the right to produce specific products.
2. India has a large industrial and Science / Technology sectors though their linkages may be tenuous. For example, national expenditure on R&D in 1988-89 was Rs 3,347 crores, of which private sector expenditures were Rs 418 crores. The modest sums available to CTD, combined with potential significant contribution from areas of interest to CTD, provides a significant challenge in narrowing the focus for operational activities. For instance, areas amenable to quick attention and concomitant results include ASIC development, dryland farming, simple farm tools, health services, food processing, and chemical technology. CTD was designed to narrow the vast potential areas of involvement through the method of collective judgement of peer opinion in Focus Groups, supplemented by targeted Baseline Surveys. Such judgements are useful since a culture of survey and assessment of markets is yet to nucleate in technology driven sectors in India. Since demands for goods and services were controlled to a large extent by central planning, demand stimulation leading to sustainable markets is a task requiring insights and perceptions of various institutions and groups.

An attempt was made to understand and evaluate some of these processes and their sustainability in the context of the policy of liberalization now in vogue. The review was charged to develop recommendations identifying processes to determine and stimulate markets, and to ensure that the technology development efforts are driven by industrial needs.

The review of over 50 documents, files, and records provided the basis for the evaluation (Annex A). A wide variety of studies and papers were sought to form the context for site visits and interviews. Such documents were to include Background studies, Workshop papers, Project Papers (PROAG, ICICI / CTD MOA), Monitoring Reports, PIR Reports, Field Visit Reports, Activity Proposals, Internal Evaluation Reports, and other relevant documents. Available documents were far fewer than anticipated, with many normal summaries not available. Those documents retrieved were reviewed with an eye to how project activities align with the purposes and goals of the CTD program. Diversions were reviewed for indications of changes in project focus in light of experience in implementation of the original project statement of work.

A series of over 20 interviews and discussions (Annex I) provided the basis for determining activities and levels of commitment, as well as operational issues. The planned use of a structured interview quickly was abandoned based on the informal operating methodology of the CTD and the nature of the activities funded and measures of performance in use.

Officials concerned from affected organizations were interviewed by the team, including representatives from the USAID Mission, Government of India, ICICI, CTD Governing Board and Secretariat, Steering Committee, Focus & Support Groups, Applied Technology Centres, and Interacting Institutions, including government, academic, industry, and financial (Annex I). Firms and Institutions seeking assistance were not reviewed, since the proposal solicitation and development process used by the CTD minimized the submission of proposals. The interviews targeted those receiving assistance from CTD. Plans for review of multilateral and bilateral agencies and organizations with potential overlapping interests and / or agendas were scrapped due to the dual considerations of an apparent low priority given by the CTD to these entities (less than half a dozen proposals appeared to be submitted) and time constraints.

A series of site visits provided the opportunity to verify and extend information in reports and interviews (Annex I). Again, the targeted process of proposal solicitation minimized the ability to visit organizations which were not supported as well as those that were to assess the broader programmatic needs and activities. The focal point of the site visits was a review and assessment of the following:

- i) Activity Centres and participants supported by CTD, e.g. the Government Tool & Training Centre,
- ii) Products and Production processes supported by CTD, e.g. the methyl ester of rape-seed oil capacitor pilot plant and the Analytical Quality Control Laboratory.
- iii) New materials and equipment provided under CTD, e.g. greenhouse, mist chamber, and tissue culture laboratory.
- iv) Manufacturing and marketing units of firms assisted by CTD were not seen, since the CTD program apparently does not include such support to date.
- v) Areas / fields where technologies are used, including Food Processing, New Materials, Informatics, and DryLand Agriculture.
- vi) Educational and R&D Institutions upgraded by CTD, e.g. UAS, IIII,
- vii) Entrepreneurs supported by, or seeking support from, CTD were minimal due to the

- operation of the CTD and its Focus Groups which did not advertise for applications.
- viii) Small and Medium-Sized businesses supported by, or seeking support from, CTD were minimal due to the operation of the CTD and its Focus Groups which did not broadly solicit applications for support and / or involvement.
  - ix) Businesses that might be supported by the activities of the CTD represented a minimal commitment due to the nature of the program and time constraints of the review, but included a few opportunities to discuss the CTD program.

Particular attention was directed to the measures of performance established both for the project as a whole and its subsidiary activities. The measures of performance reveal the philosophical position of the administering boards and set the operational direction for the activities of the project. Both qualitative and quantitative, explicit and implicit measures were sought.

In addition to a summary of the findings, selected case histories and anecdotal information was used to provide a basis for developing an understanding of the CTD process at several levels of detail.

### **III. FINDINGS and CONCLUSIONS:**

#### **A. Conceptual Understanding:**

The CTD project was developed based on a series of studies conducted by SRI International and Arthur D. Little. These studies investigated the role of technology in economic growth with particular attention to the technology infrastructure needed to support industrial growth in the modern global economic context. The principal model for the CTD concept was the U.S. model of economic development at the regional level.

CTD was envisioned to contribute to the development of the necessary technology infrastructure through human resource development, technical assistance and equipment procurement (A.I.D. funding categories). Focus Groups, made up of representatives from industry, academia and government, were to be the forum for the identification of the specific needs in specific growth areas e.g. informatics. Simply stated,

**CTD is a process for the mobilization of regional resources to foster economic growth through technology development and use.**

Technology development and use is embodied in the available technology infrastructure. As originally envisioned in the PP this mobilization was to be industrially-based, market-driven, and targeted.

Although the basic concepts of CTD may not be as transparent as one would hope, the project maintained the original intent of the PP. The evaluation team found that the intent of the PP remains the central tenets of the program. CTD is a process of resource mobilization - financial, human, and technical. This process is focused on technology development and use at the regional level. However, the nature of the mobilization effort as implemented varies from that originally envisioned.

A clear emphasis on the need for "market driven" philosophy is central to CTD activities; it is not clear whether that referred to in the PP is the market for technology by industry users, or the markets for products produced by Indian industry and the technological need of industry to compete in these markets. The distinction is subtle but important, especially with the enactment of liberalization policies by the Gov.

If the market for end products is intended as the driving force, then CTD would be expected to undertake a systematic effort to identify these market needs and opportunities and conduct an analysis of the technological requirements for Karnataka industry to compete in these markets. At present, the market analysis and intelligence dimension of CTD is weak, under the implicit assumption that the Focus Group membership will provide full and correct market information through the expertise and experience of the members. This is a weak assumption. Most members of Focus Groups come from academic and government careers. Those members from industry are retired and hence were in key positions in industry prior to liberalization when the Indian policy environment was still highly protected. With the opening to market forces, the character of market opportunities and competitive requirements is likely to change fundamentally. In some Focus Groups, specifically Informatics and New Materials, participation by active private sector representatives occurred in the project's formative stages. However, this participation has not continued.

If the market for technology by Karnataka industry is the driving force, two problems emerge: first, Indian industry, or major portions of it, generally has not appreciated the value of technology to competitiveness, especially technology found in local institutions. Such circumstances raise the need to educate industry decision makers about the value of technology and technological skills for achieving their business goals. This entails undertaking a variety of activities to educate and raise awareness in industry through media, seminars and conference and focused industry-specific initiatives. Furthermore, the technological needs of industry may not be satisfied by the technological resources available in local institutions at present. Much of Indian R&D (with notable exceptions) was reported to be focused on import substitution, a priority in a protected environment but much less so in a free market system. In turn, this focus suggests that CTD would undertake efforts to reorient the research and development directions of many laboratories and research institutes, not an easy task.

Based on CTD's original concept and its current status, the first definition of market driven which is most appropriate.

The focal point of the CTD mobilization process is the Focus Group where the needs and capabilities of academic and industry members are brought together with CTD acting as broker and a resource. Based on the original plan, the Focus Groups identify activities for support. Before starting activities in an area a Baseline Survey is conducted to establish standards of measurement for future accomplishments and confirm the judgement of Focus Groups. Given that the Focus Groups varied in the quality and quantity of industrial participation and that it is difficult for a panel to truly capture the needs of an entire industrial

sector, the Baseline Survey has an important role to play as confirmation of the needs and potential surfaced in the Focus Groups. The few Baseline Surveys completed were not used for this purpose. The quality of the Baseline Surveys are highly variable and typically do not contribute the essential template needed either for selecting the best activities and or for measuring progress.

The targeted nature of the CTD mobilization process has not been maintained. In combining a market driven need with a targeted approach, decisions must be made regarding breadth and depth of efforts. CTD is continually expanding its range of activities. With a weak mechanism for identifying market driven demands, this proliferation of activities has the potential to dilute CTD's impact. The latest management plan suggests efforts in embryo transfer, expert systems, and wormiculture. The original concept of CTD was a targeted approach dependent on strong Focus Groups identifying market needs. In order to ensure impact and industrial relevance, CTD was conceived with a narrow focus to develop some impact. CTD lacks both depth and breadth in its industrial contacts and marketing skills.

The level of understanding and acceptance of the CTD concept and process is uneven. Several participants in CTD expressed a clear understanding of the process and its various activities, but this group is rather limited. In efforts to improve the understanding of the project several descriptive versions have been put forth. Most of these efforts are aimed at a description of the CTD process highlighting or categorizing activities. For example, the CTD process has been described as being comprised of a systems analysis, innovative co-financing and specialized human resource development. This is an accurate description of the CTD as observed by the evaluation team, describing some actual and proposed mechanics of the project, but this description does not deal with the philosophic basis of the project. The various CTD audiences are not adequately informed of CTD -- both what it is and how it works. Multiple descriptions and continual discussion, with sparse documentation and no distribution material, lead to two extreme interpretations - a confused view and an oversimplified view.

The oversimplified view characterizes CTD as a one dimensional human resource development (technician training) program. The confused view has yet to determine a clear picture of CTD and questions its ultimate purpose and impact.

CTD works across a range of cultures: academic, government, business and finance. In working with such varying groups, CTD must be able to simply, consistently, and clearly present its message and its services. CTD efforts in working across cultures is most noteworthy with the academic community. CTD is introducing universities to a service and fee mentality with the goal of bringing universities closer to end users. The consistency in this effort is not paralleled by appropriate documentation to establish the results of the program.

In summary, the Project Paper outlines one standard of CTD philosophy, goals, and activities. The operation of the CTD to date is comprised of a series of activities, with variously articulated and slimly documented goals and philosophy. Congruence is required for effective

CTD development in its second half of US AID support.

**B. Functioning of CTD:**

CTD operations, including planning, proposal development and evaluation, funding mechanisms, and monitoring differ, frequently substantially, from the structure envisioned in the Project Paper.

1. Management:

CTD is a very small organization attempting to work in numerous areas, across industrial, academic and government cultures. CTD works through many fronts at once. One component of CTD is the USAID project with attendant specific project reporting and recording requirements.

The direction and control of CTD is provided *pro bono* by a group of dedicated individuals. These individuals provide their time and expertise. The implementation and monitoring of CTD is an enormous task.

The evaluation and monitoring section of CTD, established in 1992, provides the beginnings of an organized documentation system. The group was able to provide documents as requested by the evaluation team. However, the level of that documentation is lacking in some particulars. This lack will become especially acute now, as results and follow-up need to be documented. In the use of the same group of people (Focus Group) to initiate, develop, evaluate, and oversee the implementation of projects, good business practice is ignored (Annex E).

The USAID documentation of the project leaves a great deal to be desired (Annex B). USAID's role in reviewing CTD activities is at the management plan level. Based on information available to the study team, USAID may not have assumed its monitoring and program support, including follow-through, role. The information available to the evaluation team is not clear as to if this lack of review and approval of management plans is a result of USAID personnel changes or a defined policy of USAID to allow CTD to be extremely independent.

2. Proposal Development and Review:

According to the project paper the Focus Groups are responsible for proposal development. The project paper outlines nine specific criteria to be addressed in proposal development. Proposals are then sent to the Secretariat and Executive Board for review and the Governing Board for approval. Finally, the proposals are sent to USAID for administrative and programmatic approval.

The proposal criteria described in PP are the following:

- 1) Overall economic rationale - the fit between the actions and results with the broad trends in the regional economy, including the participation in strategic objectives for developing specific sectors of the economy;

- 2) Market demand - demonstrated fundamental needs for the proposed activity based on a mismatch between demand and supply and the emergence of new technological needs;
- 3) Structure and Organization - including i) basic assumptions, ii) administrative and iii) program structures including key players, primary objectives, work plans, staffing, management support, and facilities, iv) clients and their characteristics, v) sponsors / investors, vi) budgets including capital costs, operating expenses and vii) sources of revenue;
- 4) Business participation - extent and quality of business participation in proposal development, proposed activities, and financing;
- 5) Institutional autonomy - proposed institutions, with the exceptions of training programs or equipment proposals, are expected to be independent entities with their own management and board of directors;
- 6) Use and adaptation of existing technology - degree to which the proposal focuses on making the most use of existing technologies with adaptations to Indian markets as necessary;
- 7) Utilization of "Best Practices" - familiarity with the "state-of-the-art" and "best practices" is expected in all proposals, including how their use will be developed by the proposal;
- 8) Intellectual property rights - issues of technical assistance and proprietary development require that the protection of U.S. intellectual property interests be assured prior to project funding;
- 9) Environment / Health - the evaluation of proposals must explicitly consider potential impacts on both the environment and the health of consumers and be consistent with the requirements of Indian and / or World Health Organization policies related to product and product-use and the impact on health.

The actual proposal procedure is quite different from that described in the project paper. Apparently the proposals are developed through the Focus Groups, based on their direct solicitation of potential grantees; with approval often contemporaneous with proposal presentation. However, the Focus Groups are not separate entities from the CTD Secretariat, Executive Board and Governing Board since significant membership is common to each (Annex E). The proposals are reviewed and approved by the Secretariat / Executive Board which was delegated that authority from the Governing Board. In effect, the evaluation team found evidence that the Focus Group is the solicitor, developer, evaluator, approver, and monitor of CTD proposals. The team found no indication of proposals being sent to USAID for administrative and programmatic review.

The proposals are reviewed with two basic criteria in mind: a market-driven service and global competition. The proposal development appears to be an iterative process with industrial review alluded to but not documented. The specific criteria outlined in the project paper are not addressed. An oft-stated criterion that all proposals must have 50% industry sponsorship for approval apparently does not apply to training activities. Furthermore, the evidence of such support, required as a precondition or estimate of post-expenditure support, is in the process of being developed.

### 3. Industrial Participation:

CTD as currently implemented appears to be neither industry-based nor demand-driven. The composition of the Focus Groups and Support Groups limits the number of currently active private sector representatives. Where representation is in place, individuals are often retired and potentially removed from the current scene, which is changing rapidly. Private sector representation varies among the groups, with Informatics demonstrating the greatest level of private sector representation and Dry Land Agriculture the least.

Various interactions with the private sector are apparent, but the nature and the extent of these interactions does not reflect an integral role (Annex J). The Focus Groups and Support Groups are not industry based. Therefore they cannot serve as a forum for determining what industry needs. Instead, the Groups are comprised of extremely dedicated individuals who appear to be identifying technologies, training, and institutions based on their own experience. Moreover, this valuable experience, often based on a career in the public sector, is not tested by development of an extensive Baseline Survey as required. Often the marketing of an activity is undertaken after the activity is underway rather than before. Industry's input in identifying and developing proposals appears to be extremely small.

CTD indicated that proposals for activities are discussed and reviewed with industry outside of the Focus Group, and the team found only scant evidence of this, examples such as a workshop / seminar prior to the funding of CTD appeared to be the exception rather than the rule and to vary widely between Focus Groups. In addition, discussions with industry suggested that industry was not connected to the CTD process and uncertain of its role and objectives. The evaluation team was told that the review process began with the Focus Group consensus on a strong institution that was then approached and asked to develop a project proposal, often jointly with one or more representatives of the Focus Group. Approval by the study group is often contemporaneous with the presentation of such a proposal. As such, the solicitation and approval process is vulnerable to misuse.

The concept of supporting the development of SMEs is both means and ends in the Project Paper. The implementation to date almost is devoid of such a conceptual orientation. Rather than serve as a focal point for mobilization of resources for the support of SMEs, the CTD Focus Groups act as if they have a primary role in enhancing the equipment requests of a range of educational and training entities in the commendable goal of supporting the further development of the technology-based human resources of the State of Karnataka.

### 4. Institutional Development:

The implementation of tasks under CTD is achieved through the participating industries and institutions which receive funds from CTD for specific activity / project / facility purposes. Since many of the government institutions which have a good technology base and necessary infrastructure often suffer from procedural complexities with their systems, CTD plans to nucleate a number of autonomous entities, e.g. ATCs and NALTECH. About 11 such independent entities are under various stages of formation. These are also a part of the "institution" of CTD in a systemic sense. Such independent entities apparently are created to

facilitate speedy and faster interface responses between institutions and external commercial businesses. Perhaps this is an innovative approach in the current Indian context. Constant care is needed to ensure that the independent entities do not develop into additional bureaucratic bottlenecks in the overall system. 1

#### 5. Focus and Support Groups:

Focus and Support Groups are the locus of activity in the CTD implementation. Accordingly, each Group was reviewed by the team, with specific case studies within several groups selected to provide further insight into the revealed philosophy and operation of the CTD (Annex I). The Focus and Support Groups began with the intention of significant industry involvement. Even where this initial focus was achieved, the degree of industry involvement atrophied with time. Simultaneously, the Focus Groups became the locus of CTD activity, identifying potential strong partners, soliciting and approving proposals from this select group, and establishing monitoring and evaluation procedures (or their lack).

#### **C. ACHIEVEMENT OF DESIGNED OUTPUTS and PURPOSE:**

In terms of expenditures of funds, the performance of CTD may be below anticipated levels of a level commitment over project life. This must be understood in a sympathetic light given the difficulties of initiating new ventures in an Indian environment, especially given the drastic changes in the policy context over the past three years. What is important as well is to recognize that a major dimension of the CTD project is the very process it seeks to establish - one which is flexible, responsive and efficient in resource utilization, and which attempts to build upon and complement ongoing activities to the extent possible. In these terms, CTD made considerable progress, and every indication is that it will continue to do so. From the standpoint of an evaluation, this presents a problem, since many of the accomplishments are not measurable in any tangible fashion. Nevertheless, they are important.

Given this aspect of CTD, it is necessary to examine its achievements both in terms of tangible outcomes as well as movement along intended paths aimed at technological development. A summary of CTD's accomplishments from this perspective are provided below.

#### **Accomplishments**

1. Establishment of the CTD Process of Resource Mobilization: As mentioned earlier, key to the CTD project is the process of decision making, assessment, implementation, and resource mobilization it has undertaken. This is unique in the Indian environment and the slow start up must be seen in this light. Thus far, CTD has made significant progress towards establishing a process of decision making, project selection, assessment, networking, leveraging of resources and implementation that is flexible and efficient, and dynamic. There has been little indication of any bureaucratic internal within CTD, though there are layers of bureaucracy in some of the project administration activities, money handling etc.

A key element of CTD's activities is the Focus Group process, which serves to bring

in knowledgeable inputs to project identification and co-opt individuals with expertise in the appropriate areas. Though the Focus Groups have been deficient in term of the representation of industry (in particular, small and medium sized enterprises), the basic concept is sound. From the observations of the team, it was clear that Focus<sup>1</sup> Group members had a high level of motivation and enthusiasm for the CTD project, and there was general alignment of perspectives in terms of what CTD's mission was.

The progress in developing an awareness of the Role and Mission of CTD is partial. There is definitely an increasing awareness of what CTD is doing and where it fits in with respect to other organizations among those individuals and groups involved in CTD activities. Thus, many of training centers collaborating with CTD were very clear about how it added value to their activities, how it filled in gaps in the system and how they could relate to CTD. What is lacking is a broader awareness among the "public at large" and many sections of industry not involved with CTD. A public relations campaign is being developed for implementation over the next couple years to address this need.

2. Development of Academic / Industry Linkages and Networking: The CTD project places heavy emphasis on networking as a means of drawing in various inputs and leveraging resources. It is clear that CTD has been quite successful at establishing a wide range of networks at the local, national and international levels. Within Karnataka, state government agencies, national labs, universities, research and training institutes, associations and industry are all involved in one way or the other with CTD. Prominent are UAS, NEC, GTTC, IISc, CII, CMTI, CPRI, IIHR, AWAKE and NAL - NALTECH. In Mangalore, the University of Mangalore and the Canara Community College are involved. At the national level, central government agencies, associations of industries (ASSOCHAM), national labs. and private and public sector enterprises are part of the enlarging CTD network,. At the international level, relationships are being built with US organizations notably Rutgers and SRI), and various bilaterals (IDRC, Japanese) and multilaterals. In this sense, CTD's reach is quite extensive and equally important is that CTD makes active use of these networks to bring in new expertise, resources and information. A good example of the innovative use of these networks is the "Bangalore Group" formed by CTD to provide inputs into the Indian Technology Policy debate. Its networks allowed CTD to quickly bring together industry, government and private industry representatives to discuss the GOI's draft technology policy statement, and to contribute to the debate. In the TPS project, CTD is involved with the Central Potato research Institute, as well as CIP in Lima.

From a strategic standpoint, CTD has been quite effective in cementing reasonably sound relationships with a number of "strong partner" organizations that can be valuable assets to CTD in the long run. The relationships with a few major industries - WIDIA, BEL, WIPRO and BEML appear strong. Similarly, healthy relationships have been developed with some of the national labs. - NAL, CMTI and CPRI.

Whether these can be further developed into strategic alliances useful to CTD will depend on the direction the management chooses to take, and whether USAID sees this as a desirable activity. From our point of view, given the realities of the Indian context, a strong and viable CTD will need such alliances to survive and be effective. Through these alliances, CTD can derive benefits in terms of broader exposure, expert inputs and advice, resources, and negotiating power where needed. Where CTD could strengthen its alliance building is with the SME sector or with groups representing SMEs.

3. Procurement of Equipment to further CTD's Mission and Leveraging of CTD Expenditures for Equipment with In-Kind Contributions of Land and Buildings: CTD's efforts are most tangibly manifested in the assistance it has given various organizations in acquiring equipment needed by them to perform their functions effectively. Notable here is the food processing equipment provided to AWAKE, and the CNC Machine and CAD/CAM software given to GTTC. NEC has also benefitted with the provision of CAD/CAM equipment. This component of CTD's efforts is a basic but very important component which has been appreciated by all the recipients. Further equipment provision is planned for the coming year. (See Management Plan 1992-1993).

CTD is aggressive in trying to leverage USAID support for its program with resources from other sources. Proposals were submitted to the Canadians and Japanese (among others), and CTD is involved in a major training initiative (APEX Institute) funded by the World Bank. Scope for improvement exists, particularly in mobilizing private sources of money. The stated goal and requirement of 50:50 cost matching with industry is yet to be demonstrated.

4. Significant Human Resource Development through technician training by established institutions: Human Resource Development is the largest component of CTD's efforts, pervading all Focus Group areas and having a broad reach. HRD was promoted either through the direct support of training programs, from the PC training efforts in Dakshin Kannada training nearly 500 students in a favorably evaluated program to equipment and financial support for the on-going activities of NEC and GTTC. A positive feature of the HRD efforts is its explicit focus on practical hands-on training to serve industry requirements. An added benefit of CTD's efforts is some / many students in training (e.g. at NEC and GTTC) who see themselves as becoming entrepreneurs upon completion. Details about the range of CTD's training efforts are described in the section on the HRD support group in this report.

Women were given special emphasis in the HRD effort, e.g. one GTTC course designed exclusively for women. In NEC the admission policy remains 1 in 3 students is a woman (and 50% of all students must come from rural areas). The AWAKE center is exclusively for women and a significant portion of CCC PC training program students were women. Where CTD is weak is in the involvement of

women in its core activities - focus groups and support groups and overall management.

5. Initial Formation of an Organizational Structure and Establishment of Budgetary and Accounting Procedures: CTD is a long way from having a formal and solid organizational structure. However, some definite progress was made. An equipped office exists and is staffed, a brochure was prepared, and a semblance of a managerial hierarchy and division of labor are in place. However, the organization appears fragile, perhaps due to the lack of a full-time, strong manager, whose appointment the team recommends.

During the visit by the evaluation team, preparations for meetings, logistics, and other office related activities were carried out, in most instances, without any delay. Changes in programs were handled without problems and the impression given was that of a well working organization.

An interesting positive observation was one of the senior staff of CTD took courses in technology management at the Indira Gandhi Open University, demonstrating an interest in capability development within CTD. General levels of interest in the activities and purpose of CTD were high among staff members, *pro bono* and otherwise.

On the whole the achievements of CTD in such a short time period are commendable especially noting the uncertainties induced by several major economic and other policy changes that took place in India during the period.

Considerable documentation was prepared by CTD and the impression is that most activities are recorded and many appropriate reports were completed. The biggest problem with documentation has to do with twin shortcomings: no easy retrieval of documents and a lack of focus on process and outcomes specified in the project paper. These characteristics made the evaluation exercise difficult and subject to more than normal potential for minor errors. In addition, the lack of documentation addressing project requirements and outcomes has an insidious effect on project performance. Since the governance of the CTD process did not require such reporting, the project was allowed to drift from the original concept without a clear reason for changes in direction.

CTD came a long way in terms of its ability to handle USAID funds. USAID procedures and rules governing the use of funds etc. seem to be reasonably well understood. Considering that CTD is a non-US organization, the movement up the learning curve seems to be quite rapid and procedural problems in money handling should be less of an issue in the coming three years. As an added benefit, CTD is familiar with US Federal procurement regulations, which will make it easier for CTD to enter into contractual arrangements with US organizations, planned in the next

phase.

6. Implementation of a portion of the first Applied Technology Centre (ATC) through an Analytical Quality Control Laboratory (Centre for Processed Foods ATC) and greenhouse / mist chamber / tissue culture laboratory (Centre for Elite Trees ATC): The only concrete progress made is the establishment of an Analytical Quality Control Lab at UAS as part of the planned Centre for Processed Foods (CPF). The other two ATC's are in the planning stage or implementation in lieu of planning, with Centre for Manufacturing Engineering (CME) being the most advanced with the preparation of a Mission and Scope Study (MSS) and the Centre for Elite Trees (CET) with the implementation of greenhouse, mist chamber, and tissue culture laboratory, apparently before development of a Centre plan. An equipment plan for proposed Fruit and Vegetable Processing, Fruit and Vegetable Packaging Laboratories, and Fruit and Vegetable Feeder Processing facilities to complete the Centre for Processed Foods (CPF) suffers from the lack of financial analyses as recommended by the CAFT consultant over a year ago as well as a dispersed location strategy that appears to be driven by availability of space without explicit consideration of the trade-off of service available from an integrated, single-site approach.
7. Support for the Women's Entrepreneurial program (AWAKE) as a potential source for new venture development: Although the project calls for the establishment of new ventures as one of the major outputs of the CTD project, none have materialized thus far (Annex D). However, two CTD activities show strong possibilities of leading to new ventures: AWAKE, set up as an incubator, expects to spawn up to six new ventures within the next year or two; and NEC, where many of the students intend to start their own businesses upon completion of their training and gaining some real world experience.
8. Initial Steps to Test Replicability through efforts in Kumaon, Pune, and Anna University (Madras): Some measure of progress is achieved in terms of replicability of the CTD concept. The efforts to replicate CTD in Kumaon, Pune, and Madras are examples of CTD's networks. However, it is arguable whether this is true replicability or, in fact, expansion of the original set of personal networks. The farthest along is the regional development effort in Kumaon, and the Kumaon effort may be the closest to a true replicability approach. This effort is being undertaken in the shadow of sparse documentation on the Bangalore efforts providing a basis of what (not) to do, results to be experienced, etc. The efforts at Pune and Madras appear to be extensions of CTD's Bangalore-based personal contact network.
9. Continuing Attempts to Raise External Funds and thus Develop Sustainability: No evidence was found that CTD will be able to sustain itself. Attempts to raise funds from sources other than USAID, and to strengthen CTD's linkages with stronger organizations, substantially are not successful to date. A lack of any evidence of

sustainability at this stage may be a function of the slow start up of CTD. However, the failure to find financial projections of key initiatives documenting sustainability, the apparent lack of strong private industry support (including financial), and the failure to attract significant outside support may be indications of a program that is drifting and unsustainable in its current form. Movement towards sustainability should be a primary concern of USAID oversight of the project in the future. On the positive side, the apparent sustainability of a few projects is demonstrated by the possible self-sufficiency of AWAKE and NEC, although documentation again is weak.

10. Development of New Materials: The development of New Materials includes support for a CPRI pilot plant to produce a methyl ester of rape seed oil (MRSO) for use as a capacitor fluid, and development of a COMPAC facility at NAL for development of composites and training. The recently established COMPAC facility conducted one training program to date, with new material development remaining in the potential category, while the testing for the MRSO project remains in the future.

The MRSO project is a notable achievement, embodying the features of possible commercial viability, existence of good markets, close working with SMEs (private sector), and HRD leading to better products. CPRI is working with a capacitor manufacturer (Meher Capacitors, Pvt. Ltd. India). Meher is reported to be investing some financial resources for pilot scale operations for the manufacture of a large number of capacitors which will be filled with MRSO fluid for large-scale trials. The pilot plant was built by another small scale industry in Bangalore to CPRI design specifications. The pilot plant will be managed by a young and confident team (including one woman Ph.D. and one male engineer).

11. Development of a Baseline Survey in software, as well as implementation of training in CAD / CAM, PC awareness, and other software use training and modest efforts in other areas: The Informatics Focus Group held an early workshop to determine training needs for the local electronics industries, followed some time later by a partial Baseline Survey of the Software industry. An early preliminary Baseline Survey in the Buyer / Supplier Development Initiative elicited buyer / supplier needs and priorities, but did not result in apparent subsequent project activity to date. The team noted that both initiatives are characterized by significant private sector involvement, at least initially.

#### **D. SETTING UP APPLIED TECHNOLOGY CENTRES, NEW VENTURES, and START-UP FIRMS:**

A number of Applied Technology Centres and similar activities are on the drawing board, often without consistent and required background development, including Baseline Surveys, financial plans, and US AID approval. An Analytical Quality Control Laboratory is in operation as the first segment of a planned decentralized Centre for Processed Foods including Fruit & Vegetable Processing, Packaging, and Feeder Processing facilities. The greenhouse, mist chamber, and tissue culture laboratory form the basis for the creation of a Centre for Elite Trees. A Mission and Scope Study (MSS) was developed early in 1993 as the basis for the creation of a Centre for Manufacturing Engineering, but the team did not find evidence of MSS either for CPF or for CET.

Neither new ventures nor start-up firms were identified with the activities of the CTD, save indirectly through the support for women entrepreneurs through the AWAKE program and, to some extent, through NEC & GTTC.

#### **E. REPLICABILITY and SUSTAINABILITY:**

The lack of contemporaneous documentation of the process limits the replicability of the CTD process in Bangalore. The informal approach to Need Assessment, Project Definition, Proposal Development, Proposal Review, and Results Monitoring that CTD follows, although advantageous to responsive operations, makes replication difficult and did not produce a quick ramp-up to compensate for the lack of due process. Replicability requires a solid and well-structured foundation as a point of reference. Until and unless policies and procedures are developed as recommended (below), the CTD program can be replicated only through established personal networks. Such a replication is more an extension of the current program than replication of a successful template. Therefore, the steps to replicate the current CTD activity in Kumaon *et al.* begs the question as to why replication is desirable at this point when efforts need to be focused on core activities in Karnataka.

To date, CTD is unsuccessful in gaining significant external funding support from other donor agencies. The Project Paper did not envision CTD acting as a venture capitalist. However, the investment of financial resources in a high risk venture such as an ATC, which was contemplated, appears to provide some philosophical basis for gaining return from the commitment of resources in some fashion. The failure to commit venture funds to date indicates a low likelihood of gaining sustainability from investment funds. Without business plans, including financial projections, for the CTD and its various components, the CTD activity must be viewed as nonsustainable in its present form and the sustainability of specific activities, e.g. ATCs, is problematic. While an active venture capital component developed early in the life of the program might contribute to sustainability, the path chosen minimizes such a role.

The question "Should the CTD process be sustained?" cannot be ignored as a policy issue, both for USAID and the Karnataka community. USAID's original implied desire to avoid the creation of a bureaucracy, together with the apparent minimum cost and low profile approach

of CTD, creates an environment in which *sustainability* is neither a goal nor a realistic outcome. At the same time, the Project Paper does not define the nature of sustainability, either as an institution or as a barrier reduction process.

To address the feasibility of sustainability as an ongoing institution / process, CTD should recognize three potential supporters of its activities: customers (service fees, royalties, return of equity), governments (grants), and / or business (grants or investments). Without an aggressive definition of specific competency, the ability to attract government funding in the future cannot be expected to materially deviate from experience. Without a program redirection and reinvigoration to target investment and aggressive fee development, significant support from investees will not materialize. The development of a successful program stands the chance of gaining business investment, as a "window on technology," for potential acquisitions by existing firms, but not without demonstrated success in business development. Therefore, to achieve institutional / process sustainability in the current climate, CTD must be established and run as a business... a high profile business driven for impact and success.

The sustainability of the CTD resource mobilization process can be viewed at the level of barrier reduction. By this measure, the CTD process is sustainable post-funding, if the barriers between university / institute and industry permanently are reduced / removed and a natural organic process of interaction remains in place. By this measure, the CTD process is not yet sustainable, due to the modest participation of industry in the CTD process to date. The achievement of such sustainability may require adding another dimension to the university / institute culture, requiring professors / researchers to add a new, unfunded agenda item of industrial interaction to their current full agenda of primary goals. Concurrently, industry might be expected to devote additional resources to contribute to academic agendas without an immediate return. While the experimental nature of the CTD resource mobilization process may be able to test this assumption, the challenge of meeting this level of sustainability may be more difficult both to accommodate and measure than the requirements for financial sustainability.

#### **F. USE of US AID RESOURCES:**

Financial audits ensure that proper accounts of expenditures are in place. The lack of documentation on project development and approval, specifically the failure to apply the required nine criteria, indicates the necessity for imposing the required discipline and procedures to ensure proper stewardship of resources.

Significant US AID funds were used in the purchase of computers (hardware and associated software) and machine tools for academic and training institutions. In those cases where CTD provided equipment that clearly was needed by the organization (e.g. NEC, GTTC, AWAKE), its positive role is quite clear. In some cases it was unclear if the equipment provided to a specific unit in an institute was in fact a priority for the institute as a whole (e.g. UAS). (See Annex G and H for a breakdown of expenditures by CTD.)

### **G. Gender Considerations:**

While a few training programs are set up for women, the participation of women in the direction of the CTD, from its Focus and Support Groups to the recipients of CTD funds, is lacking. Little evidence was found to suggest that the proactive gender-sensitive issues were addressed. The notable exception is the support for the women's entrepreneurial development program (AWAKE), an incubator for the development of woman-based businesses. This initiative could serve as a model and stimulant for other gender-focused activities.

### **IV. LESSONS LEARNED:**

The development of the CTD program seems to hold a number of lessons that can be applied to other paradigms seeking to support economic development.

- 1) The key to successful mobilization of resources for technological development and use is strong leadership; in the CTD, senior officials put their reputations on-the-line for program development. Without the dedicated effort, including the development of a volunteer organization while the initial operating funding was being developed, the CTD mobilization of resource program would remain an unfulfilled dream
- 2) Personal, informal networking is an important mechanism for the mobilization of resources for technology application. While many academic studies concentrate on nature of the technology and other characteristics, venture capitals realize that the most important factor in the commercialization process is the quality of the people involved, including their professionalism, experience, enthusiasm, and commitment.
- 3) The use of existing, strong institutions is a necessary and successful tactic to deliver quick, cost-effective training. Attempts to create a "greenfield" program for human resource development requires constructing significant infrastructure, including awareness of the institution. CTD management chose to work through existing institutions, leveraging USAID funds with the reputation of its in-place partners. For instance, preference to supporting existing private enterprises, rather than set up competing ventures, such as the AQCL.
- 4) The CTD resource mobilization process can provide a catalytic role in helping bridge the transition from protected, production-based to an open, competitive, market-based economy. Raising the awareness of the requirements to deal explicitly with the needs of various market segments (what they want and are willing to pay for) and competitors, the CTD process can have a significant impact in the evolving Indian economic scheme. Obtaining outside funding is a peer review of doing something useful.
- 5) An innovative, informal, and flexible structure can accomplish results, e.g. the training program of the CTD, in the short- and medium-term. In the long-term, a solid organizational foundation is needed. The solid foundation is required to ensure that programs are carefully, but effectively, designed and managed. Such a solid

foundation need not be bureaucratic.

- 6) Programs to develop relationships with private industry must be responsive to their needs and include fast approval cycles. The culture of private industry values decisiveness more highly than the process orientation of academic and governmental institutions. To bridge such a culture gap, organizations such as the CTD must be creative in developing mechanisms to accommodate governmental process while providing the speed of results required to maintain business interest.
- 7) Given the reported inherent nature of the Indian bureaucracy, equipment procurement and technical assistance may be more effectively carried out through independent entities (e.g. the ATCs). Consistent with good business practice, blanket approvals by CTD to such entities therefore may be advisable;
- 8) The effective leverage of resources with strong partners may deliver quick results, but a concomitant strong public relations effort is necessary to create a sustainable organization. Partnering with strong institutions can stunt the growth and confuse the mission of a new activity, such as CTD. A strong public relations effort provides program direction as well as define the program and goals of the program separately from its strategic partners.

#### **V. RECOMMENDATIONS:**

The following recommendations are conceptual and programmatic in nature and include short-term administrative and business issues, as well as, long-term support necessary to develop and maximize the impact of the CTD project. The recommendations by the evaluation team are with the belief that the CTD initiative is worth efforts to ensure it is "on track" and that the experiment be given the necessary latitude to determine its full potential.

*Note: The following recommendations are listed in order of priority in each category.*

#### **A. Concept:**

- 1) CTD and USAID should agree to a simplified and concise statement of project. The team suggests that this statement be: *A mobilization of regional resources for technology development and use, in a limited number of focused areas, for maximum impact.* In parallel with this restatement of the project, a revised logical framework for the measurement of resource movement, training, technology advancement, and industrial progress is necessary.
- 2) CTD must ensure that representatives in responsible operating positions in private and public industry should form the majority in CTD Focus Groups in order to truly reflect the changing environment in Indian industry. Specific efforts must be devoted to ensure the participation of women and / or young rising stars from industry. CTD must encourage strong industry relationships, particularly at the SME level by restructuring operations as required.

- 3) CTD Board should retain and empower a full-time, experienced Associate Executive Director with full responsibility to manage operations. To fund this position, USAID reprogram certain funds (e.g. \$100,000) as an endowment, with interest earmarked for the costs of such Associate Executive Director, including administrative assistant. This position is recommended to ensure implementation of the Mid-Course Correction Action Plan.
- 4) CTD must make the support and development of private sector industry its prime focus and incorporate it into their basic operating philosophy. In some instances, it appears that CTD's activities are in competition with existing firms without any clear rationale for such action.
- 5) CTD should determine the requirements of external funding agencies to support ventures and restructure their philosophy and/or operations in order to attract significant external funding and attain project sustainability. One measure of the success of the CTD technical resource mobilization process is the ability to attract other funding.

**B. Administrative and Business Practice:  
Strategic:**

- 1) CTD management should provide USAID with succinct strategic, tactical, and budgetary plans as envisioned in the project paper. Individual projects need to be considered and evaluated according to specific structures. Currently, the application of such tests is not apparent, since True Potato Seed does not fit in a Focus Group, the locus for project review.
- 2) USAID should support CTD in developing measures of performance for the mobilization process and subsidiary operations that will drive operations to achieve project goals. See Mid-Term Corrective Action Plan. For instance, overall measures of performance could include:

Measures of Economic Activity (Karnataka and specific industry groups, before and after compared to India as a whole)

Economic Output

- sales / revenue / production

Investment (intensity)

- investment (new capital expenditures)
- R&D or Development as a percentage of sales
- investment per employee
- investment to sales ratio
- capital expenditure to sales ratio

Employment

- number of jobs / employees
- technical employees to total employees ratio
- skilled employees to unskilled employee ratio
- number and age distribution of firms / enterprises

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- average wage relative to regional averages

Measures at the firm level, representative sample within industries compared to CTD especially applicants versus firms supported

- sales / revenues / production
- profit (Rs., Return on Assets, Return on Investment, Return on Sales)
- product range; number of new products
- investment (new capital expenditures)
- R&D or Development as a percentage of sales
- average wage relative
- investment per employee
- investment to sales ratio
- capital expenditure to sales ratio
- quality
  - product price margin
  - rejection rate; scrap rate
  - market share
- technical employees to total employees ratio
- skilled employees to unskilled employee ratio
- number and age distribution of firms / enterprises

- 3) CTD should consider limiting the range of areas of activity and focus on enhancing industrial participation and marketing of existing activities. CTD should also ensure that market needs and financial viability are assessed and business plans developed prior to approval and implementation of a project proposal. (Annex II X, Prototype Project Checklist)
- 4) CTD should delay replication until the conceptual and management concerns with the Karnataka activity are addressed and implemented. The determination of what is to be replicated remains to be accomplished, while administrative efforts should be devoted to bringing the operations of the Karnataka CTD within compliance with US AID expectations.
- 5) CTD should enhance their public relations and publicize their project concept and objectives to the industry and general public. The team recommends that CTD utilize technical assistance to ensure that this is done in the most professional manner. This will enhance CTD's effectiveness at bringing industries, institutions, and external funding agencies together.

**Operational:**

- 1) CTD and USAID should curtail project commitments and dispersement should be curtailed until USAID and CTD concur on a revised logframe and expected outputs. This may result in the need for a project extension. In other words, USAID should provide CTD counsel to steer the project more towards its original goals in some areas and address some of its shortcomings immediately. See "Short-Term Action Plan for Mid-

Course Correction, May 21, 1993, Mid-Term Evaluation team." Current projects should meet minimum standards immediately. Each project should be carefully reviewed to ensure that momentum is not lost while the background requirements are being put into place.

- 2) USAID should provide management counsel and support to enable the potential of the CTD mobilization process to be achieved. Careful oversight to avoid micromanagement will be the key for the successful development of the program in its second half of existence. This oversight should include sincere discussions about the appropriateness of each project in light of the requirements laid out in the Project Paper. Oversight to question specific vendors for individual items of equipment would be a misuse of the policy level review that should come from US AID (Annex Z).
- 3) CTD should increase the technical resources available to them on a regular basis in order to strengthen the process of evaluation of proposals, subsequent monitoring of projects, and to keep track of interrelated activities. CTD should establish a data base to allow project detail and easy "sort" on various criteria. Technical Assistance should be carefully used for proposal evaluation to ensure that both technical and business considerations are reviewed.
- 4) CTD should modify their organizational structure to integrate support group activities of human resource, buyer-supplier, venture capital, gender, and environmental aspects into all the Focus Groups. CTD should also develop and implement a mechanism to communicate program goals and operations through an iterative process with the Focus Groups and integrated support activities. This communication is necessary to ensure that the Focus Groups keep the mission and project requirements in mind during the review process. Effective managerial and technical documentation is one important aspect of this process.
- 5) USAID and CTD should review and simplify the approval cycle procedures within CTD, ICICI, and USAID to respond to proposals in an expeditious manner. CTD should approve and implement proposals quickly to maximize the opportunities for private sector involvement.
- 6) CTD and USAID should concur in the desirability of a USAID employee taking a position as an invited observer to all meetings of the CTD Board of Governors. From that position, the USAID representative would be in a position to provide ongoing counsel relative to strategic issues of implementation of the CTD resource mobilization process.

**Reporting:**

- 1) CTD and USAID should modify and implement reporting requirements to reflect the special nature of the CTD mobilization process. Such measures should include measures of flow (activity of technology advancement) as well as results (technology implementation).

- 2) CTD must develop and implement record keeping and reporting mechanisms to provide project level and aggregate reporting in a timely and consistent manner. Data about the CTD project, focus groups, support activities, individual projects, budget, and actual spending should be available. For this purpose, CTD is advised to hire a full-time manager with considerable project management experience to implement this.
- 3) CTD must develop and implement independent reporting and monitoring programs to track independent entities such as NALTECH and CPF that are created. This monitoring and reporting should ensure that they do not compete with existing private industry and ensure the entities long term beneficial effects.

If the CTD Board of Governors and Executive Committee do not concur in some set of corrective actions along the lines of the recommendations above, the evaluation team leader recommends that USAID give serious consideration to an alternative Action Program directed to the orderly immediate termination of the CTD experiment in the mobilization of technical resources to support regional economic development.

#### **VI. TEAM:**

The CTD evaluation team consists of individuals with both broad and deep experience in addressing the issues facing the goals of the CTD. This team is based on professionals from Eccles Associates (New York).

The team is led by Jack Bishop, Ph.D. who brings the experience of establishing and developing a Technology Commercialization Center for Northwestern University and the State of Illinois as well as taking a state-sponsored venture capital fund to a fully invested position, investing some \$5 million in 18 months with a current market value in excess of \$30 million. Mr. Bishop has industrial experience from the laboratory bench and basic research to the Board room with responsibilities for strategic planning, forecasting, and business assessment for two Fortune 200 firms and has consulted around the world on issues of entrepreneurship and technology-based economic development. Mr. Bishop was awarded a B.S. (Chemical Engineering, Univ of Colorado, 1961) and Ph.D. (Interdisciplinary, including management, economics, statistics, and psychology, Univ of Illinois, 1972).

Other team members include:

Kerri-Ann Jones, Ph.D., is the Deputy Chief of the Technical Resources Division of the Asia Bureau, USAID / Washington, DC. Ms. Jones has worked in international development for the past eight years, focusing on the areas of biotechnology, technology commercialization and technology policy. She was awarded a Ph.D. (Molecular Biophysics and Biochemistry, Yale University) and a A.B. (Chemistry, Barnard College, Columbia University).

Atul Wad, Ph.D., is a Research Professor of Technology Management at the Center for the Interdisciplinary Study of Science and Technology and Director of Technology of the International Business Development (IBD) program at Northwestern University. Mr. Wad's

expertise is in the areas related to the utilization of technological resources for economic development. He is currently in charge of a major program in Mexico aimed at developing a technology base enterprise development program at the State level in various states. Mr. Wad also teaches in the areas of Technology Management and International Technology and Business Transactions. Mr. Wad consulted widely for private corporations and multilateral and bilateral institutions. Mr. Wad was awarded a Ph.D (Organization Theory, Kellogg Graduate School of Management, 1978) and a Bachelor of Technology (Mechanical Engineering, Indian Institute of Technology, 1973).

Ramaswamy Mahadevan, Ph.D., is a Member of Technical Staff in VLSI Systems Research at AT&T Bell Laboratories. Mr. Mahadevan's research areas include analog VLSI, sensors, silicon micromechanics, robotics, and power electronics where he was responsible for concept development, analysis, and design. Mr. Mahadevan was awarded B.Tech. (Electrical Engineering, IIT Madras, 1981), M.S. & Ph.D. (Electrical Engineering, California Institute of Technology, 1982 & 1986)

Y. S. Rajan is a postgraduate in Physics with Electronics (Univ of Bombay, 1964). He was with the Indian Space Programme since its inception as a Research Scholar and Development Engineer (microwave payloads) and Systems Engineer. Mr. Rajan received an ISRO assignment at MIT/Lincoln Laboratory and NASA Goddard Space Flight Center (1969-73). His subsequent responsibilities in ISRO spanned scientific / technical / promotional / managerial / administrative / public information & relations, in addition to international (general and UN) responsibilities (1974-88). These responsibilities included developing cooperative agreements with industries, universities, and state governments in addition to playing a key role in the evolution of the decade profiles (1980-90, 1990-2000). Since 1988, Mr. Rajan is an Advisor in the Department of Science & Technology as well as Executive Director of the Technology Information, Forecasting, and Assessment Council (TIFAC).

**Note:** *CTD is a complex project with numerous activities and variable documentation. The evaluation based its findings on as extensive a document review and interview schedule as possible. Verification of all information and follow-up interviews were not possible. Unintentional inaccuracies may exist, but the team believes that substantive issues raised in the review are not compromised.*

Prepared by

Eccles Associates  
Mid-Term Project Review

28 May 1993

**United States Agency for International Development  
New Delhi India**

**Mid-Term Evaluation**

**CENTRE FOR TECHNOLOGY  
DEVELOPMENT**

(CTD 386-0507)

**ANNEX I**

**FOCUS & SUPPORT GROUPS  
with  
CASE STUDIES**

May 2-28, 1993

Mid-Term Evaluation Team  
Eccles Associates - New York  
Bishop - Jones - Rajan - Mahadevan - Wad

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## **INFORMATICS**

### **A Review of a Focus Group**

#### **History and Rationale:**

A significant portion of the rapidly growing Indian electronics and manufacturing industry is centered in and around Bangalore in the State of Karnataka. A wide range of public and private sector industries, both small and large, are located in the State. These include Indian companies such as Indian Telephone Industries, Bharat Electronics, WIPRO, Bharat Earth Movers Limited, Hindustan Machine Tools, and Infosys as well as multinational collaborations such as Digital India Limited, Texas Instruments (India), WIDIA, and Tata Elecsi. In addition, this region is home to a large number of excellent academic, training, and R&D institutions, such as, Indian Institute of Science (IISc), Raman Research Institute (RRI), Regional Engineering College at Suratkal, National Aeronautical Laboratory (NAL), Centre for Electronics Design and Technology, Electronics Test and Development Centre (ETDC), Central Manufacturing Technology Institute (CMTI, formerly the Central Machine Tool Institute), and Central Power Research Institute (CPRI).

The Informatics Focus Group was the first Focus Group formed when CTD was founded in April 1989. This Focus Group had its roots in industry-academia meetings that were initiated by the founders of CTD. The term *informatics* was used to signify the many electronics areas such as computers, telecommunication, software, and information systems. The Focus Group was a medium to bring industry and academia together to discuss and identify areas of importance to industry, and formulate project proposals for consideration by CTD's executive committee for approval and implementation. The membership of the Focus Group was often a dynamically varying one and reflected the specific technical or application area under consideration. The Informatics Focus Group is comprised of two main panels that concentrated on software and mechatronics issues.

#### **Focus Group Members:**

The Informatics Focus Group (Annex F) currently is composed of twenty six members. Five of these members are with the CTD Secretariat, six are CTD consultants, ten are from academia and R&D institutions, and five are from industry. Many of the CTD consultants were formerly executives in industry with considerable experience in the technological areas of interest to the group. While only five members currently represent the industrial sector on the Focus Group, there was more participation from industry during the formative stages of the projects. However, the potential for a broader and more active industrial participation has yet to be fully realized.

#### **Focus Group Activities:**

The Informatics Focus Group supported numerous activities with sixty eight proposals in the areas of software, electronics, and mechatronics (Annex K). The majority of these activities relate to human resources development with the help of universities and other training centers in Karnataka. The Focus Group relied on industrial responses and surveys of the Indian software industry conducted by National Association of Software and Service Companies

(NASSCOM) to target their computer related training activities towards two broad groups.

The NASSCOM survey revealed that computers were under utilized in India, especially by service industries, e.g. banking / utilities / transportation, as well as by the general business community, for management and manufacturing. The survey also concluded that a large number of the private training institutes provided inadequate quality of computer education. Hence, the group organized computer awareness workshops to educate the community about personal computers and their utility in business and industry. They also organized several short courses for training people with high school education on the use of PCs and in commonly used software for word processing, spreadsheets, graphics, etc. CTD helped equip schools and smaller colleges in rural areas with PCs and trained teachers and faculty so that they in turn could act as trainers. Some of the projects include PC training programs at KREC Suratkal, MEI Polytechnic, Canara Community College (CCC), and Roshini Nilaya. CTD also made the training more accessible to the economically disadvantaged communities by subsidizing the cost of these courses.

The second group targeted was at the higher skill levels required by the software industry. In this area the private industry generally recruits personnel from engineering colleges. However, the industry consensus was that many of the fresh graduates were lacking hands-on experience in many areas and were not sufficiently knowledgeable in systems integration aspects. To address these issues, the Focus Group initiated training courses in UNIX, C, ASIC Design, and Digital System Design through the Indian Institute of Science's Center for Continuing Education (CCE) and the National Aeronautical Laboratory. They also brought academia and industry together to formulate an updated syllabus for a two year Masters program in computer software at Mangalore University. They are implementing the program using experts from academia and industry as instructors.

The Focus Group also started and amplified existing training programs in electronics assembly and printed circuit board design through Nettur Technical Training Foundation Electronics Center (NEC) and Government Toolroom and Training Center (GTTC). In addition a Rapid Prototype Development Laboratory is proposed to provide prototype design and fabrication facilities for electronics industries.

The Mechatronics panel of the Informatics Focus Group addressed the broad areas of computer aided design (CAD) and computer aided manufacturing (CAM) owing to the presence of numerous large and small machine tool industries in the area. The Focus Group commissioned CMTI to do a survey of small toolrooms in the Bangalore area to assess their capabilities and weaknesses. The survey was rather limited in its sample size, however, it did bring out major deficiencies in the areas of CAD/CAM utilization, heat treatment of machine tools, testing, and quality control. Training programs were developed to train machinists in the use computer numerically controlled machines (CNC) and CAD/CAM through well established institutes such as CMTI and training centers like Government Toolroom and Training Center (GTTC). Center for Manufacturing Engineering (CME) and the Metrology Center are proposed Applied Technology Centers that are being set up in collaboration with industries like BEML and WIDIA to address the areas of flexible manufacturing systems (FMS) and robotics / automation for hazardous tasks such as welding and painting.

**Activities Evaluated through Site Visits and Discussions:**

Members of the evaluation group visited the following sites:

1. GTTC: CAD, CNC operations training, electronics training for women;
2. CMTI: CNC operations training, FMS demonstration cum training;
3. NEC: electronics training, PCB design, CNC maintenance training, rapid prototyping (planned);
4. BEML: robotics / automation;
5. Tata Elxsi: Geographical Information Systems, proposed;
6. WIDIA: FMS System development.

In addition, extensive interviews with representatives from industry, R&D institutions, and academia provided valuable data and insights.

**Analysis:**

The Informatics Focus Group consists mainly of members from CTD and academia with relatively modest industry participation. CTD's documentation clearly reveals that significant industrial interest and participation was present during the formative stages of the Focus Group. However, industrial participation seems to have decayed rather rapidly with time, perhaps owing to the slow approval and implementation of proposals by CTD and USAID. Nevertheless, this participation did help the Focus Group select specific areas of electronics, software, and mechatronics to emphasize. Many of the academic institutions and participant private sector industries appear to view CTD as a funding agency, rather than as a promoter of technology transfer or technology advancement. The larger public sector industries view CTD more as a facilitator for human resources development. Interaction with the private sector extremely is limited at present and activities truly are neither market-driven nor product-oriented. Buyer-supplier issues are yet to be addressed.

A large number of proposals are listed by CTD (Annex K). However, requisitions for equipment and software for the same project are often listed separately. The Focus Group's process for generating proposals appears *ad hoc* and no evidence of technical / peer review of proposals by an independent panel of experts was found. To a large extent a bias toward training and infrastructure development in academic institutions is evident, without a Baseline Survey to substantiate such a need above alternative projects. Many of these workshops and training programs were conducted successfully, based on student evaluations, while others are still in progress. For the most part, these courses were well received by both trainees and industry, but the impact on-the-job is yet to be assessed. GTTC and NEC are the most successful training centers and provide excellent hands-on training that is responsive to industry needs in a timely fashion. A more detailed analysis of the training programs is provided in the section on the Human Resources Development (HRD) Support Group (below).

The CAD/CAM, robotics, and FMS efforts under CME appear to have the maximum direct interaction between industries (BEML & WIDIA) and institutes (CMTI & IISc). The CME applied technology center is still in genesis and the projects success and impact on industry cannot be assessed at present.

**Recommendations:**

- CTD should increase the involvement of the private sector, especially SMEs. CTD must move outside of the academic / government community for its advice and guidance.
- CTD should address buyer-supplier issues directly, developing a strategy to nurture small scale industries and ventures with larger industries as their main customers.
- CTD should address key technical areas of extreme importance to industry, such as systems integration, practical VLSI design, computer aided software engineering (CASE). Even the academic and R&D institutions are deficient in these areas and the industry should be encouraged to provide experts for instruction in these areas.
- CTD must implement a procedure for impact evaluation. CTD's impact can be measured only if the paths of trainees, services rendered by CME, and establishment of new enterprises are documented.
- CTD must establish Measures of Performance for the Group, keyed to the requirements of the project.

## CENTER FOR MANUFACTURING ENGINEERING A Case Study in CTD Strategy - Tactics - Operations

### **History & Rationale:**

The Bangalore region of Karnataka is home to a large fraction of India's thriving machine tool industry. There are a few large companies like Hindustan Machine Tools, Widia, and Bharat Earth Movers Limited, while there are numerous small tool rooms. The region is also home to the Central Manufacturing Technology Institute which is the premier institute for machine tool and manufacturing engineering. Discussions in the Mechatronics panel of the Informatics Focus Group which consists of participants from industry, training institutes, and R&D institutions highlighted the need for the adaptation and application of advanced manufacturing technologies. This confirmed the need for the establishment of an applied technology center for manufacturing engineering (CME) to focus on the following technologies: Computer Numerically Control (CNC) technology, Computer Aided Design (CAD), Computer Aided Manufacturing (CAM), Robotics and Automation, and Flexible Manufacturing Systems (FMS). Industrial organizations pay a membership fee of Rs. 50,000 to participate in the center and obtain services such as rapid prototype development, production technology planning, training, and access to a reference data bank with current information on manufacturing technologies.

### **CTD's Role in CME:**

The CME is currently at the proposal stage and various segments are being finalized. CME is planned to be an "open" center by networking arrangements between industry and institutions through the use of existing facilities. CTD proposes to provide some equipment to augment existing facilities and facilitate access to manufacturing technology experts the world over through a MoU with Carnegie Mellon University's Robotics Institute.

The first project planned is the Rapid Prototype Development Center for Industrial Robots at BEML targeted at industrial arc welding and painting applications. The estimated cost of the project is Rs. 85 million with CTD's contribution expected to be around Rs 30 million in the form of equipment and training. BEML is developing a 6 degree of freedom robot, robotic welding and painting work cells, as well as a knowledge center for cell simulation and off-line programming. BEML has a joint effort with Tata Elecsi to develop the hardware and software for the robot controller in association with the Indian Institute of Science. BEML's efforts have been ongoing for two years and they hope to have the project completed in another two years.

The second major effort in the area a collaborative effort between WIDIA and Digital (India). WIDIA plans to develop relatively inexpensive FMS systems for the Indian market, based on their considerable expertise in the design and manufacture of CNC machines. WIDIA has the infrastructure and a dynamic management to realize these plans, having set up the FMS line for the HAPP project in collaboration with HMT. WIDIA's capital investment in the FMS project is estimated at Rs. 50 million, excluding engineering and manpower costs. WIDIA is negotiating for CTD contributions of Rs. 6 million. Digital is expected to develop the hardware and software for the overall controller for the FMS system. WIDIA's efforts began a year ago and they intend to have the pilot FMS system ready for integration in a year. CTD's contributions to this project are relatively small and their role is more catalytic in

nature. The original CME proposal had an FMS effort proposed at CMTI, however CMTI developed a CIM project funded by UNDP. The CMTI project does not conflict with the WIDIA effort as they are developing the FMS machining cells themselves whereas the CMTI effort is mostly a demonstration and training system.

The specific niche areas chosen by the proposed CME projects appear well thought out and CTD's role as a catalyst is an appropriate one. In addition the industrial collaborations developed correspond with the objectives of the CTD project. The lack of a Baseline Survey and defined objective outputs will complicate the ability to measure the payoff from the CTD investment.

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## **GOVERNMENT TOOL & TRAINING CENTER**

A Case Study in CTD Strategy - Tactics - Operations

### **History & Rationale:**

Government Tool Room & Training Center (GTTC), established in 1972 with Dutch support, is a leading tool room and training center in India with well established industrial consultancy, prototyping, and training programs. GTTC expertise includes training on all types of tools, especially press tools, molds, and die casting tools for medium and large scale industries. Their operating expenses are funded through GOI funds and through consulting and contract jobs for industry. The Center constantly strives to update its tooling and machining expertise and training courses offered by adopting state of the art techniques. Towards this end, GTTC acquired equipment such as electrical discharge machines, computer controlled three axis measuring machine, computerized numerically controlled (CNC) machines, and Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) facilities. GTTC offers a tool room machinist's course, courses in tool & die making, tool design, tool engineering and specialized training in CAD/CAM, CNC machine operation, electronics, and technical instructors training programs. GTTC adapted the courses offered at the center to the varying needs of the Indian machine tool industry in a timely fashion.

### **CTD sponsored GTTC Projects:**

CTD recognized GTTC's effectiveness in training skilled machinists, mould designers, die casting tool designers, and electronics technicians who are in high demand in regional industry. Consequently, CTD chose to provide funds to update GTTC's equipment in key areas so that effective training in areas targeted by CTD's Informatics Focus Group could be accommodated.

- **Women in Development, Electronics:** Training women in electronics, this program aimed at women who could become entrepreneurs or work independently. CTD provided electronics instruments and training kits for the training program. An initial twelve day program was held in December 1992, and additional courses are in progress.
- **Women in Development, Desk Top Publishing:** This program, aimed at providing training in DTP software in English and Kannada, is essentially job oriented. CTD is only helping augment GTTC's existing facilities with DTP software and a laser printer. This project is currently in progress and training courses have yet to begin.
- **Training in Applications of CNC Machining Center:** CNC Vertical machining centers were purchased and are being installed to enable GTTC to provide trainees with in-depth understanding of CNC machines and their programming.
- **CNC Training at GTTC - Baikampadi:** CTD proposes to procure CNC Econo and T-70 trainer lathe for GTTC - Baikampadi to provide basic training to students and technicians on the use and programming of CNC machines.

### **Analysis:**

GTTC successfully carried out many courses in CNC training and electronics training for women. Positive feedback on these courses from trainees and industry are a preliminary measure, with impact analysis (increased development and use) yet to be conceived.

## **FOOD PROCESSING**

### A Review of a Focus Group

#### **History and Rationale:**

The Food Processing Focus Group was initiated as the Fruits and Vegetable Processing and Flower Panel 15 April 1989. The justification for a Food Processing focus was the agricultural base in the Karnataka region and the obvious potential for the development of value-added food processing industry.

#### **Focus Group Members:**

The Food Processing Focus Group is composed of 17 members (Annex E). Six of these are identified as members of the CTD Secretariat. An additional seven members are listed as CTD consultants. The remainder of the members are from the government and university communities. One person is a non-retired member of the industrial sector on the Focus Group. The potential for industrial participation is yet to be fully developed.

#### **Focus Group Activities:**

By December 1989 the Group identified seven areas of activity:

1. Collection of current data on fruits and vegetables.
2. Production plan for tomatoes for industrial use as conversion into puree, paste, crush, & peeled.
3. Development of a multi-processing plant for tomato, mango, guava, etc., including a satellite unit.
4. Human resources development program for the fruit & vegetable industry.
5. Monthly Focus Group meeting to generate new ideas and implementation of Action Plan.
6. Supervisory & managerial training program in cooperation with management institutes, research laboratories, etc.
7. Action Plan to develop interaction between Universities, Research Institutes, and Industry.

This broad agenda directed the activities of the Focus Group in a general way (Annex F). The Food Processing Focus Group subsequently reported over 30 activities (Annex L). The nature of the activities primarily involve a variety of training programs and the development of two facilities, an Analytical Control Laboratory (the first portion of a Center for Processed Foods) and a Facilitation Center for Processed Foods / women's business incubator (AWAKE).

The CAFT Center at Rutgers is being used as for technical consulting, and a Memorandum of Understanding is being put into place for on-going support. The Center for Processed Foods is proposed for implementation at several different sites, choosing the availability of land and buildings over the advantages of an integrated, one-stop center as envisioned for an ATC, a trade-off that is neither documented nor commented on by US AID.

Project Proposals for the development of the following facilities were recently prepared, but concentrate on facilities and equipment, paying only scant attention to the market, missing several Project Paper required evaluation criterion, and containing financial projections

limited to initial equipment costs, in contrast to the year-old recommendation from CAFT for the development of income and expense detailed projections:

- Product Development Laboratory, Feb 1993, 4.4 million Rs, 3 staff.
- Feeder Processing Plant, Feb 1993, 13 employees.
- Fruit & Vegetable Packaging Facility, Feb 1993, 8.03 million Rs.

**Activities Visited during the Evaluation:**

The review team visited the two operating entities, the Analytical Quality Control Laboratory and the AWAKE Center (Incubator) for Processed Foods. In addition, the first meeting of the Board of the Food Processing Center was attended and a site visit was taken to the potential location of a Processing facility at the Indian Institute of Horticulture (III).

The Analytical Quality Control Laboratory (AQCL) is adjacent to the Dryland Farming Focus Group sponsored Greenhouse and Mist Chamber / Tissue Laboratory in donated facilities. The AQCL provides training for students (free) and testing for industry (50% discount for SMEs). Commercial fees were reported to be set somewhat below market rates due to the customer inconvenience associated with the remote location of the AQCL. Requests by the review team for customer lists, to assess the quality and nature of services offered relative to private laboratories, are yet to be fulfilled. The AQCL operates with donated land, building, and staff under a memorandum of understanding for equipment title to revert to the University at the end of five years. The AQCL has a goal of sustaining operations by covering the costs of consumables with fees, but apparently without the benefit of either operating or financial plans. The AQCL appears to be a well run, active facility.

AWAKE is a voluntary organization comprised of successful women entrepreneurs. The organization is run by a board of directors and is financed through membership fees, grants from government and international donors, as well fees studies. AWAKE developed an incubator for women interested in entering into food processing business. Over the course of a year, AWAKE will train women in the food processing, both the business and the technology. The participating women will be able to develop their own products and conduct initial sales through use of AWAKE's food processing license. AWAKE will also assist the women in obtaining the financing needed for them to move out on their own. The incubator is in its first year of operation with six women in the program. The maximum capacity of the program is 40 - 45 participants. CTD provided the food processing equipment for AWAKE's incubator, but has not been engaged either in the development or in the monitoring of the program.

**Analysis:**

The Food Processing Focus Group is comprised primarily of retired government and academic men of high stature. The activities reflect a bias toward training and infrastructure development in academic institutions. Interaction with the private sector severely is lacking.

The Analytical Control Laboratory and the training activities can be viewed as competitive to existing private sector activities. The CTD targets the development of facilities and training programs for SMEs. Neither was a Baseline Survey conducted to confirm this need, nor apparently were SMEs involved in the development of the program to date.

The Analytical Quality Control Laboratory appeared well maintained, with both direct and indirect evidence of use. A fee schedule is available detailing the costs for the various services, with indications of at least some degree of competitive operation since statement was made that prices were set somewhat below the market due to the isolated (out of town) location. While some thought was reported to be given to implementation of the general policy of self-sustainability, the implications of providing free facilities to students and 50% discount to SMEs were not developed in the form of a business plan with financial support.

A great deal of attention in the early years was devoted to the tomato project, until it stopped appearing in the record of activities a year ago. Conversations indicated that the project was proceeding through third parties and would reappear for support in the not-too-distant future, but documentation available to the team is lacking.

A clear focus on an integrated approach to food processing, from pre-processing through processing and quality control to packaging, is a strong point of this Focus Group & Center program and proposals. However, the physical dispersion of the facilities sacrifices the ability of the units to develop a full systems operation. Moreover, such a dispersal strategy is counter to the one-stop-support envisioned in the Project Paper. Were the implicit trade-offs of what appears to be a cost minimization strategy to be made explicit, the rationale for such a dispersed facility approach might be better understood.

A range of entrepreneurial-support options appear to be lacking in the development of this focus area. While programs appear to be developed with the interests of SMEs in mind, their involvement, from Baseline Survey through participation in the nature and extent of operations, is not revealed in the documentation available to the review team.

Both the above mechanisms have the advantages of leveraging CTD resources and providing at least the potential of sustainability. In addition, the resources of experienced academic and industrial leaders could be used in this fashion as an evaluative mechanism.

The training and nurturing of new entrepreneurs through the AWAKE incubator process is an excellent example of assistance to an emerging industry. CTD's support for the essential equipment of the AWAKE Food Processing incubator is a model activity which supports an innovative sustainable organization, AWAKE, and an industry with large product and market potential.

**Recommendations:**

- CTD should develop both extensive review of needs and capabilities prior to the commitment of resources to programs. The lack of explicit market and competitive evaluations forces the Focus Group to rely on the extensive personal experience of its senior members.
- CTD should solicit proposals more widely, with subsequent evaluation through an obvious arms-length process, using external reviewers as appropriate.
- CTD should explicitly involve existing SMEs and entrepreneurs in the development of proposals for approval by the Focus Groups and Secretariat for support. Such support

could be investment in the development of prototypes and the development of business plans for subsequent venture funding by CTD and other financing sources.

- CTD should broaden the base of the Focus Group to include increased consultations with, and involvement of, the private sector and farmers. Moving outside an apparently congenial company of academic / government communities for its advice and guidance runs the risk of injecting diverse viewpoints and challenges to orthodoxy... a risk that should be undertaken.
- CTD should investigate the opportunity for entrepreneurial development by supporting the processing and analysis initiatives as private enterprises. The potential leverage of funds from such a strategy, as well as the support for the development of an expanding private sector, could provide a cost effective option for program development.
- CTD should develop Measures of Performance for the Group that are keyed to the requirements of the Project Paper and extended to the needs of specific activities.
- CD should commence regular, succinct, consistent reporting of project activities and impacts. Reporting systems need to be put in place that provide project expenditures and results in a form that is amenable to reporting at both the Focus Group and Support Group level in addition to CTD summarization.
- CTD must ensure that, prior to the commitment and dispersal of funds, certain minimum information as specified in the Project Paper (nine requirements) is available, including appropriate notice / approval to USAID as required in the Project Paper.
- CTD must prepare an Annual work plan and summary of results, including financial information as well as programmatic results in addition to the short descriptive narrative currently available. This planning and reporting must include activity, facility, ATC, and Group levels, with aggregation to the CTD as a whole.

## **DRYLAND AGRICULTURE**

### **A Review of a Focus Group**

#### **History and Rationale:**

The Dry Land Agriculture (DLA) Focus was not one of the focus areas originally identified for the CTD project. During the finalization of the project paper, Dry Land Agriculture was proposed as a focus area by the Government of the State of Karnataka. The GoI (Delhi) was also strongly supportive of a focus in this area.

The justification for a DLA emphasis was that dry land agriculture continues to be an essential source of income for the region. Seventy percent of Karnataka's land is considered dry land, subject to limited, unpredictable rainfall. The needs of the farmers to be able to remain economically viable, despite the shortages of water and irrigation systems is important. The focus also was seen as an area clearly extended beyond Karnataka to dry land conditions throughout India.

The Government of Karnataka has previously supported efforts to address dry land problems through the Command Area Development Authority and the Watershed Programs. These efforts attempt to coordinate the various interested departments of forestry, horticulture and agriculture.

#### **Focus Group Members:**

The Dry Land Agriculture Focus Group is currently comprised of fifteen members (Annex E). Six of these members are with the CTD Secretariat. Two more members are CTD consultants. The remainder of the members are from the government and university communities. The CTD consultants were formerly with the Government of Karnataka. No representatives from industry are on the Focus Group. Given the fact that this Focus Group was identified by the government, the lack of industrial participation is not surprising. However, the potential for industrial participation through seed companies, and tissue culture companies remains latent, while some growers associations participated in some of the meetings, but they are not listed as official members of the Focus Group.

#### **Focus Group Activities:**

A Baseline Survey of Dry Land Agriculture is yet to be conducted.

The activities of the Focus Group fall into two main categories - grafting of elite trees and tissue culture. The grafting of elite trees will allow farmers to increase their yield of crops such as mango, jack and cashew. Through the tissue culture approach, CTD is assisting in the development of more high value crops for dry land and in the training needs in this area.

The Dry Land Agriculture Group is currently supporting 18 activities (Annex N), including:

1. the promotion of mass multiplication technology to provide grafts of elite trees (2 activities);
2. green house and mist chamber development (4 activities);
3. strengthening tissue culture facilities in academic institutions (6 activities);
4. tissue culture research (2 activities); and
5. seminars and training (3 activities).

Also, an evaluation is in process to assess the green house and mist chamber work.

**Activities / Sites Visited during the Evaluation:**

The University of Agricultural Sciences (UAS) was visited during the evaluation. This is the site of the activities in grafting of elite trees. The rationale for this activity is grafting from elite (high yield) trees will contribute to the farmers' production and therefore earning capacity. In times of drought, the financial contribution from the trees will provide at least subsistence income for the farmer. A green house and a mist chamber were established to support this activity by propagation of the grafts.

The aspiration of these efforts is to develop entrepreneurs at all levels, from the individual farmer to the association / company. The UAS proposes transfer the multiplication technology to interested parties for price, at a sliding scale dependent on the ability to pay. The UAS will also assist those interested in building greenhouses or mist chambers needed to produce in quantity.

Indo-American Hybrid Seed, a large and successful seed / tissue culture / green house enterprise, put up the greenhouse for the UAS, with the use of indigenous technology at the request of UAS. It appears that UAS improved some of the indigenous technology through modification, of indeterminate extent.

Additionally, CTD provided support to UAS for the establishment of a small tissue culture laboratory. This facility is to be used for training as well as research. The facility just has been completed. An already established building was renovated. There are still technical difficulties, e.g. temperature control in the plant room and the lab does not appear fully staffed.

CTD produced a film to publicize the activities at UAS. In this film, and through some other references, it was determined that the activities at UAS are envisioned to comprise an ATC in elite trees. In addition the film indicates that future activities in the tissue culture laboratory will include work in genetic engineering.

**Analysis:**

The Dry Land Agriculture Focus Group is comprised of eminent university representatives who have identified an approach based on two existing technologies - grafting and tissue culture. The multiplication of grafts and the development of facilities to house the multiplication process required technical adjustments. The proposed tissue culture work requires the application of tissue culture technology to important crops and trees. Work in tree tissue culture is limited. The proposed work in genetic engineering, mentioned only in the promotional film, is also assumed to be related to important crops and trees. By necessity this work will be very basic in nature.

Activities of the DLA Focus Group reflect a bias toward training and infrastructure development in academic institutions. Interaction with the private sector is severely lacking. The absence of the private sector participation is compounded by a view which suggests that private sector is not cooperative. It is not obvious why the private sector should be cooperative. The UAS activity can be viewed in some aspects as competitive to already

existing private sector activities, e.g. production of green houses. The CTD perspective is that their target client in Dry Land Agriculture activities is the farmer or group of farmers who wish to use grafting or the multiplication of grafts to increase their income.

Given the nature of this Focus Group, it is difficult to assess the appropriate niche for CTD. There are numerous university programs in tissue culture throughout India. There is also an increasing number of companies becoming interested in tissue culture. Grafting is not a new technology, but there is scope for its increased use. CTD may be correct in their assessment that there is great potential for the growth of individual and small enterprises in this area.

The baseline work is nonexistent, with CTD making its programming decisions based on the experience of Focus Group members. Industry was not surveyed for their training needs in the area of tissue culture.

The film produced by CTD presents the activities conducted at the Elite Tree Center at UAS. It is unclear whether the purpose of the film is to serve as a marketing tool or as an instructional tool.

**Recommendations:**

- CTD must implement increased consultations with the private sector and farmers. CTD must move outside of the academic/government community for its advice and guidance. The private sector is becoming increasingly active in tissue culture and CTD's efforts should be better integrated. The use of grafting and multiplication technology is dependent on the farmers ability and willingness to adopt the technology. More effort needs to be placed in this area.
- CTD must implement a procedure for impact evaluation. CTD's hypothesis only will be resolved if the paths of trainees, sale of grafts, and establishment of separate enterprises is documented along with the economic results.
- CTD should not support the development of any more academic tissue culture facilities.
- CTD's work in tissue culture should not expand into genetic engineering. Although genetic engineering is a powerful technology, it requires a large and long term investment. Several research institutions throughout India are engaged in this basic research.

**TRUE POTATO SEED**  
A Case Study in CTD Strategy - Tactics - Operations

**History & Rationale:**

The True Potato Seed (TPS) project, though it does not neatly fall into one of the specified focal areas of CTD, offers insight into the relevance and direction of CTD efforts to date and provides some clues as to possible revisions and rethinking about the conceptual framework that forms CTD's activities.

The TPS project was initiated as a result of the potential relevance of TPS to India, and in particular Karnataka, coming to the attention of the management of CTD and the Center for Processed Foods (CPF) Focus Group. The true potato seed is the seed from the flower of the potato plant. The common means of propagation of potato in most India (and the world) is by vegetative reproduction (seed tubers). According to CTD estimates, only about 2,000 tonnes of breeder's seed is produced in India, sufficient to cover only one third of the potato growing area in the country.

CTD, in collaboration with the Central Potato Research Institute in Simla and the All India Coordinated Potato Improvement Project (21 centers around the country), is targeting the increase in the production and distribution of TPS throughout Karnataka. Note: potato cultivation in the Karnataka increased in recent years, compared to declines in other potato growing states.

**Analysis:**

TPS has several advantages over seed tubers:

1. 100 grams of TPS is adequate to cover one hectare in contrast to 1500 - 2000 kg of seed tubers.
2. TPS is viable for five years, light and is easy to handle and to store, whereas seed tubers are bulky and perishable.
3. TPS can be produced in all potato growing areas whereas seed tubers have to be produced in the Northern Indian potato growing areas where the climate is cooler.
4. The economics of TPS, on the face of it, are far superior to seed tubers. According to CTD estimates, 100 grams of TPS will cost Rs. 1000.00 while the 1500 - 2000 kg of tubers needed for the same area will cost Rs 7500/- - 10000/-
5. The use of TPS will free up about 20% of the potato crop produced for consumption, since this will not be needed for vegetative reproduction.
6. The production of TPS can generate an additional stream of income for those farmers involved in this activity.
7. While TPS does not address some serious problems associated with potato production, such as brown rot, it does promise the potential of a stronger and more disease resistant crop.
8. The population obtained from TPS is likely to offer a wider genetic diversity and greater resistance to pathogens in contrast to genetically identical clonally propagated crops.

On the other hand, shortcomings to the TPS approach include:

1. TPS involves higher labor inputs because of additional farm operations
2. The TPS approach represents greater likelihood of vulnerability to environmental stresses.

3. Heterogeneity for various characters inherent in seedling populations remains to be determined.

At present Karnataka produces 720,000 tonnes of potatoes over 36,00 hectares at an estimated value of Rs 100 million. Seed potatoes costing around Rs 25-30 million are purchased by the state from U.P. If TPS were used, TPS groups estimated that 300 kg of TPS, costing Rs 3 million, would be adequate to cover the entire area.

CTD's plan for TPS entails the following actions:

1. Involve the State Agricultural Universities at Bangalore and Dharwar for seed production and testing
2. Target production of 50-60 kg in the first year (1993-94)
3. Use state Horticultural Department farms to test TPS
4. Initiate the program on a broader scale by involving about ten progressive farmers and students to produce 200 kg of TPS
5. Train farmers, extension workers and scientists in TPS. (At present 14 people have received training at Modipuram). CPRI, NSC and the State Horticulture, Departments and Ag. Universities, would be involved in training

#### **Recommendations:**

Although the TPS project is in its early stages, several comments can be made with respect to what this project indicates about the CTD approach.

- CTD should extend current networking to include the private sector. The TPS project is heavily based on networking that CTD facilitated. The members of the Focus Groups represent most of the key public sector organizations involved in potato research and production (e.g. CPRI, ICAR, CIP) and the scientific expertise in this area. CIP Lima is represented in the project and is assisting in various stages. Agricultural universities, State and Central Agricultural and Horticultural departments and organizations concerned with seed production are involved. On the other hand, a distinct lack of private sector involvements in the project or of farmers groups is striking. Considering that several private seed growers are in the area, and the involvement of farmers from the earliest stages of development of such a project, these lacunae should perhaps be addressed in the near future.
  - CTD should evaluate intellectual property right issues as an integral part of the TPS development. TPS certainly is a project with the potential to directly contribute to technological development and the utilization of technological capacity in the State. The involvement of CIP and CPRI are significant in this respect because some scientific and technological issues are still unclear with respect to TPS. On the other hand, no special concern is expressed so far with respect to Intellectual Property Rights (IPR) issues, and the proprietary implications of developing new seed varieties. The role of tissue culture research and applications in the project and the interactions between the TPS project and organizations involved in TC are as yet not well articulated.
3. CTD should consider the full system considerations of the commercialization of TPS. TPS builds on a number of existing initiatives and is focussed on a product area with apparent potential in India. Various aspects of the overall system, required to assure a sustainable program, appear to be recognized - for example, the need for training, testing

and storage facilities, sources of technical know-how and assistance, potential sources of financing, etc. On the other hand, issues related to establishment of channels and distribution networks for the seeds once high volumes are achieved, potential competition, detailed total cost analysis, and economic returns are not addressed. As mentioned earlier, private sector involvement is almost non-existent and needs to be increased as soon as possible. Very little information on the competitiveness aspects of TPS are addressed, including will the project be able to provide seeds and services at a competitive price; what is the competition now or potentially, and what are the expected levels of market demand for potato as a food crop. In the same vein, little attention has been paid to the potential of supplying the processed food industry and the levels of demand there (with the exception of an investigation into the possibility of using potatoes to make infant food). If the processed foods avenue seems promising, then a entirely new set of technological issues would need to be examined.

4. CTD should include the TPS activity into one of the Focus Groups and ensure proper project documentation. The project, as mentioned earlier, was not the result of a systematic selection and screening process using the criteria suggested in the project paper. However, TPS does meet many of the criteria to varying degrees. Such opportunistic project development efforts can be healthy to sustain for CTD, so long as there is some consideration given to the criteria at the appropriate stage. In the spirit of avoiding excessive bureaucratization of the project, such spontaneous projects should be considered. However, such initiatives should still be the product of properly constituted Focus Groups (with end users and private firms adequately represented) so as to maintain some degree of structure to the project and prevent the CTD the folly of attempting to respond to a wide-range of worthy initiatives without a unifying concept.

## NEW MATERIALS A Review of a Focus Group

### **History and Rationale:**

Consumption of modern new materials in India (metallic, polymeric, etc.) is extremely low compared to world standards. Capability in research & development in such advanced materials, including special metallic alloys and advanced composites, combined with the ability to use such materials in specialized areas (e.g. space, atomic energy, aviation) are well proven in India. Clearly notable gaps arise in the wide-spread commercial use of these new materials technologies. The development of technology for such applications can be of immediate benefit to the growth of industries and commerce.

The New Materials Focus Group (Annex E) was initiated in January 1990 and held few meetings (Annex F). From the documentation available to the review team, the process and criteria of selecting specific projects was not apparent. However, given the large number of areas in this untapped commercial field, the choice of two partner institutions (National Aeronautics Laboratory - NAL and Central Power Research Institute - CPRI) for joint projects with CTD is a particularly useful tactic given the proven technological excellence of these institutions.

### **Focus Group Members & Activities:**

New Materials Focus Group is chaired by Prof. R. Narasimha, an eminent scientist / technologist of the country and Director of NAL. Other members are: Dr. R.M.V.K. Rao Head FRP Pilot Plant, NAL; M/s P.C. Nayak, CTD; K.S.N. Murthy, CTD&P, CTD; & Dr. R. Srinivasan, Consultant to CTD & Head Computer Center, Dy.Dir. NAL. No members of industry are represented on the Focus Group, in spite of the presence of numerous material technologists and industry personnel in Bangalore. Given their prevalence, the reason for the absence of qualified industry personnel on the Focus Group is not clear. The first meeting was marked by the invitation of a number of industry personnel. However, many were reported to be diffident in entering into activities involving technical upgradation or new applications of new materials. An approach of building teams around expert institutions and utilizing them as role models through training and practical demonstration was adopted. To implement such a demonstration approach led to the CTD establishment of an arrangement with NAL for composites development and CPRI for MRSO and later epoxy resins.

### **Activities Visited during the Evaluation:**

The team was given a brief presentation by the Director General at CPRI and visited the pilot plant. In addition, the team visited the NAL facility for development of composite materials.

### **Analysis:**

The review of the activities of this Focus Group can be best understood by considering two specific activities Rape Seed Oil and Composites (for Composites, see the COMPAC case study following).

#### **CPRI - Methyl Ester of Rape Seed Oil (MRSO)**

The CPRI - Bangalore was established by the Government of India (1960) and was reorganized as an autonomous society under the Ministry of Energy (1978). The major

objective of the CPRI is to serve as a national laboratory for applied research in electrical engineering and to function as an independent authority for testing and certification of electrical equipment manufactured in the country, including the operation of several regional testing centers. CPRI has excellent facilities not available elsewhere in India and extended its services to industries throughout its 33 year existence. A substantial portion of its operational costs are supported by nominal charges for services, consultancies, and testing.

High inflammability of mineral oils used in power equipment and components, combined by the fast depletion of petroleum crude and inherent toxicity lead to an urgent search for newer, non-hazardous dielectrics for power transformers and capacitors. One approach explored by the CPRI is the synthesis of suitable alternatives from natural oils with potential significant fire retardency. This search included non-edible vegetable oils abundantly available in India. The evaluation and processing of MRSO began in 1987. Experiments in 1990 confirmed the potential use of MRSO as an alternative capacitor fluid, including potential price advantages and reliable sources. The project cost (2.6 million Rs). After providing for interest at 19% and 20% gross returns, the rate of return is above 29%. The market for capacitor fluid is estimated at 1,500 tonnes per year, requiring less than 1% of the rape seed harvest at full conversion. The bulk of the technical development was conducted over the past 7 years at CPRI.

Based on the outcome of the study, the use of MRSO in coupling capacitors was taken up in close collaboration with a manufacturer of coupling capacitors. This manufacturer has the second largest installed capacity for production of capacitors in India and stands sixth in market share. In spite of this standing, the manufacturer is not in the position to fund a pilot-scale project as well as conduct field trials for market acceptability, but is in the position to develop suitable manufacturing and testing capacity.

The key to this project involves several significant factors:

- alleged cartel pricing by two suppliers of transformer / capacitor oils, squeezing the transformer / capacitor manufacturers who are unable to pass on such costs.
- the capacitor manufacturer involved in the project is a small enterprise without capital to expand, but who would gain capital from increased margins resultant from decreased costs with the anticipated results of the project.

In spite of minimal private sector involvement in the Focus Group, this project has significant private sector involvement. The lack of documentation on the size of the market and impact beyond a single manufacturer does raise questions of relative spending priorities and operating process, but the general thrust appears consistent with CTD objectives.

#### **Recommendations:**

- CTD must develop increased consultations with the private sector. CTD must move outside of the academic / government community for its advice and guidance to avoid developing technologies that are intellectually interesting but do not have a commercial market.
- CTD must develop procedure(s) for impact evaluation. CTD's hypothesis will only be resolved if the paths of trainees, sale of products, and establishment of separate enterprises is documented.

**NATIONAL AERONAUTICAL LABORATORY / COMPAC**  
A Case Study in CTD Strategy - Tactics - Operations

**History & Rationale:**

Consumption of modern new materials in India (metallic, polymeric, etc.) is extremely low compared to world standards. Capability in research & development in such advanced materials, including special metallic alloys and advanced composites, combined with the ability to use such materials in specialized areas (e.g. space, atomic energy, aviation) are well proven in India. Clearly notable gaps arise in the wide-spread commercial use of these new materials technologies. The development of technology for such applications can be of immediate benefit to the growth of industries and commerce. The basis for a composite industry exists in the presence of over 1,000 small and medium sized fibre-glass product manufacturers producing water-storage tanks for domestic use, chairs, and industrial products. However, most of these manufacturers operate at a low level of the technology in both the design and the manufacturing stages. The market for fibre-glass goods is significant. If the manufacturers can absorb improved design and manufacturing capabilities, many new applications are possible, including as a substitute for wood in many construction applications. This area is significant since the G.O.I. removed the use of wood from its central building codes effective 1 April 1993. Thus the choice of advanced composites as an area needing attention to technology - industry linkages is obvious, timely, and natural.

**Activities Visited during Evaluation:**

The review team visited NAL on 11 May 1993. A comprehensive and excellent presentation by Dr. R. M. V. G. K. Rao covered all of the activities of NAL in the area of composites as well as the specific CTD project COMPAC. Various documents brought out by NAL on Composite technologies development and pipeline techniques were provided to the team. In addition, the team visited the technical facilities and saw a few products. The training course conducted for the personnel for industries was discussed in some detail.

**Activities:**

COMPAC facility is to be established with the assistance of CTD. The Composite Product Development and Applications (COMPAC) is planned to be built around the FRP Pilot Plant at NAL. Gaps proposed to be filled by the COMPAC program include:

- Provide services to industry in testing, characterization, and quality assurance to ensure product reliability.
- Training the personnel for industry to fabricate more sophisticated products, e.g. FRP molders.
- Provide some facilities for prototyping new products and technology transfer / commercialization services.

The existing facilities (fabrication and test) are proposed to be augmented through funds from CTD to form COMPAC.

One training course of 4 weeks was organized by NAL / COMPAC along with the Small Industries Service Institute - Bangalore (SISI). This course comprises one week (management, EDP, lectures), one week FRP materials and molding methods; two weeks practical training on molding of small components at NAL / COMPAC. The course fee is Rs. 500 per person for the 25 attendees who were selected from some 40-50 responses to

advertisements in local and regional newspapers

**Analysis:**

The choice of composites area for support, and NAL as the lead agency, appear to be soundly based although without any documentation on the decision process and alternatives. A facility such as COMPAC, with a strong training component, prototype development capability, and testing facilities can be very useful in helping industries move toward commercializable products in a timely manner. However, attempts to develop a set of commercializable products either to target specific industry segments or to stimulate entrepreneurial initiatives are not apparent. Such examples, if present, might have the effect of stimulating industries to make their own analysis and develop proposals for joint projects targeting early commercialization. The training courses have the capability to send trainees back to industry not only with technical skills, but also with enhanced ability to conceptualize new product(s) and the related commercial aspects for producing viable new products. Without such an approach, the training of industry persons per se is not likely to result in the enhanced ability of industry to target new products.

As regards the costs / benefits from the projects, it is difficult to arrive at any quantitative indices, since the main focus is on creation of awareness in industry and upgrading the skills of industry personnel. Beneficial effects are likely to be slow in coming without proactive human resource development efforts in industry to support the targeting of new and commercially competitive products. Such targeting could be accomplished, if necessary, by special course modules. The discussions and documentation do not reveal if such an approach, or other approaches, are envisioned. The course fee of 500 Rs per person may be too low

- the fee fails to cover the direct costs of the course,
- excess applicants could be screened by fee, rather than administrative choice, with the same proposed effect on enrollment
- a more market-based fee could enhance the quality of enrollment (and program output) with an associated higher expectation for commercialization on all parts.

NAL representatives expressed concern that an increase in the course fee may inhibit small industries and potential entrepreneurs from course participation.

**Recommendations:**

- CTD should ensure the innovative and aggressive marketing of COMPAC to industries.. If necessary, persons with such special communications skills should be inserted into the system.
- CTD should ensure that training technical persons on new methods, prototype development and testing, etc. is sufficient and adequate. Training them, or any person from the same industry to be able to identify market opportunities and analyses the potential commercial viability is essential. Therefore, course content should be enhanced with the techniques of market analysis and product costing.
- CTD should ensure that test and consultancy services reflect market and business conditions as an integral part of technical support. This activity should not merely sell the test time, but help industries learn to seek such services based on cost effectiveness and special advantages.
- CTD must develop a Baseline Survey to form the standard of reference for subsequent

value analysis and establish the premise of market demand (current or latent).

- CTD must ensure the development a Plan for COMPAC, including basic theory and practice of operation, assumptions of process, and financial statements summarizing operating and capital costs. This operating and financial plan will support the development of COMPAC through ensuring baselines of activities required and costs / revenues consistent with program goals.

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## HUMAN RESOURCE DEVELOPMENT

### A Review of a Support Group

#### History and Rationale:

The original project paper stresses the importance of focussing on the development of personal skills in the region to contribute to the development of competitive technology-based industry. The Project Paper also suggests the need for HRD efforts to be responsive to the real needs of industry and to seek to have part or all of the costs of training covered by companies.

Underlying this project statement is the view that in today's global economy, educational and training institutions need to become more responsive to the market and depend increasingly on fees for covering their costs. Important to bear in mind here is that since the inception of the project, the Indian policy environment has changed dramatically, with a strong orientation towards liberalization and opening up of the economy.

The Human Resource Development Support Group has its activities embedded in each Focus Group. As a separate Support Group, this activity is concerned with ensuring the development of important training components in all program areas.

#### Focus Group Members:

The membership of the HRD Support Group is balanced, with adequate industry representation (Annex E). The industry members are drawn from AEG-NGEF, Kirloskar Electric, National Instruments, NGEF, and Bharat Electronics.

#### Focus Group Activities:

The CTD engaged in the promotion, facilitation and implementation of a wide range of human resource development activities (Annex F). HRD was the most substantial aspect of CTD efforts to date with a number of training programs, seminars and other HRD efforts were undertaken under the umbrella of each Focus Group.

Based on the latest figures available to the evaluation team (May 1993), the following is a summary of activities to date:

	<u>HRD</u>	<u>CTD Total</u>
(a) Number of Support Group Meetings	27	323
(b) Number of Proposals Received	8	242
(c) Number of Proposals Approved	7	152
(d) Number of firms assisted	2	205
(e) Number of Products / Services Commercialized	0	0

These figures do not reveal that, within each of the four Focus Group's activities, significant HRD components comprise these figures. For instance, HRD activities include Informatics (45 of the 68 activities), Food Processing (18 of 36 activities), Dryland Agriculture (12 of 18 activities), and New Materials (3 of 6). If viewed in this fashion, almost 75% (101 out of 152) of CTD's activities can be said to have an HRD dimension.

**Analysis:**

Based on this information and interviews with various individuals and organizations involved in the HRD effort of CTD, the following observations can be made:

- The reported figures only relate to the proposals approved by CTD. No data was available on the proposals that were not approved and as such, no clear conclusion can be drawn as to the application of any selection criteria to HRD proposals.
- In a qualitative sense, the informatics HRD efforts tend to be more focused on the provision of equipment to facilities for training purposes.
- Awareness of the CTD project and its relevance to HRD is quite high among the cooperating organizations that are benefitting directly through CTD support ), e.g. GTTC, NAL, CMTI, IISc, NEC, etc.). Relatively less evident is an awareness as to CTD's role among the end users, in particular private industry. This reflects one of the serious problems with CTD's efforts overall, i.e. a weak link with the private sector, with notable exceptions in workshops to determine industry needs held with NEC and GTTC and the MSc Software Course syllabus development involving Tata Eleksi and WIPRO. Still the question must be raised as to whether CTD is simply playing the role of providing equipment of educational and training institutes that lack alternative sources of support, or whether these initiatives are indeed contributing to a betterment of the human resources for technology development in the State.
- In the last year, CTD developed a format for proposal preparation and evaluation of the effectiveness of training programs. The systematic use of these formats should provide a useful overview of the quality of the HRD efforts of CTD. At this stage, only one year's reports are available.
- A key issue in HRD is the proper role and extent of subsidies. To date, most of CTD's HRD efforts were heavily subsidized through equipment purchases, fee waivers and support for training costs. This is not necessarily a negative reflection. India has traditionally had a culture of heavy subsidy for education and indeed produces vast numbers of skills in all areas. The problem that CTD should and does seek to address is the quality of these skills given the new realities of the global economy. In the short run it is not likely that an expressed demand for such training will materialize and hence subsidies can be a positive measure. As industry begins to appreciate the value of these skills, the possibility of self-financing, even partial, through fees and tuition should be considered. It is however, unrealistic that such HRD efforts will ever be totally self-supporting.

**Recommendations:**

- CTD should consider the balance of HRD activities, since most of the training thus far has been directed towards the informatics sector, with relatively much less emphasis on the other areas.
- CTD should assess the quality of the training. Even though student evaluations were consistently high and prima facie the design of programs such as the M.Sc. software

curriculum and the GTTC and NEC programs appear to address some the HRD needs of Karnataka (and India), the true quality of this training will only be measurable by the performance of these students in the years following their training. While a sound assessment of the quality of these courses is premature, the implementation of monitoring and tracking programs to ensure cost-effective follow up needs to be put into place now.

- CTD should consider the level at which training efforts should be focused. Most of the current HRD efforts are aimed at the technical level. However, the need for managerial and higher level skills was stressed on several occasions by HRD Focus Group members and industry representatives as well as the original project design.
- CTD should conduct a Baseline Survey, including determination of industrial needs and an inventory of the types of training currently being provided in various institutes, both private and public, to defining gaps and future needs and determine the competitive position of CTD offerings.
- CTD should determine the balance of the HRD component in its activities. The needs in India for skills at all levels is vast and CTD must determine its efforts in terms of substance, quantity, and impact.
- CTD should assess the provision of subsidized training in the context of its sustainability and the nature of free-market philosophies.
- CTD should monitor the extent of utilization of equipment donated to institutions to assess impact and future equipment needs.
- CTD should consider supporting business (marketing, finance, etc.) initiatives for academic researchers to accommodate a primary project goal of commercializing laboratory technology.
- CTD must develop a plan of action to ensure representation on all Focus Groups and other such panels, discontinuing this Support Group in favor of an integrated approach.

## **VENTURE CAPITAL**

### **A Review of a Support Group**

#### **History and Rationale:**

The Venture Capital Support Group was developed in response to the perceived need for venture funding of SMEs in India, specifically Karnataka.

#### **Focus Group Members:**

The Venture Capital Support Group is currently comprised of 5 members (Annex E). Two of these members are identified as members of the CTD Secretariat. The other three members represent the university (IISc), a venture capital fund (TDICI), and a forum (CVCF). No one is from the entrepreneurial or SME community on the Focus Group. The potential for industrial participation is yet to be fully developed.

#### **Focus Group Activities:**

The Venture Capital Support Group is involved in only 4 activities (Annex F). These activities all involve workshops / seminars. Thus, the Venture Capital Support Group is essentially a latent activity. *Ad hoc* unwritten plans are reported in place to co-invest with existing venture capital funds, including the provision of management counsel on business development and structuring.

Representations were made that the Group plans to form a Venture Capital Forum and publish a venture capital newsletter (Annex X), although written documentation, plans, mailing list, fees, etc. were not available.

#### **Activities Visited during the Evaluation:**

None, excepting a short interviews with Mr. Shedde (ICICI) and Mr. Acharge (Chairman, Center for Processed Foods) to explore the nature and extent of venture capital in India.

#### **Analysis:**

The Venture Capital operations of the CTD are latent and reactive. While the PP does not identify funds for Venture Capital, provision of equipment in the form of an investment with repayment in terms of either royalty or equity might be considered to gain sustainability.

#### **Recommendations:**

- CTD must view venture capital funding as a possible basis for sustainability of the CTD activity as well as support the development of entrepreneurial initiatives from inventors and SMEs. This program either should be significantly invigorated with professional support or deprogrammed (either through releasing the funds for other activities within CTD or setting up a specified fund for management by an existing venture capital organization).
- CTD should develop Measures of Performance keyed to the requirements of the Project.
- CTD should consider the relative impact of commitment of resources to activities such as the Venture Capital Forum versus the implementation of an aggressive investment position for the support of SMEs consistent with the purpose of the project.
- CTD must develop a plan of action to ensure representation on all Focus Groups and other such panels, discontinuing this Support Group in favor of an integrated approach.

## **BUYER / SUPPLIER DEVELOPMENT**

### **A Review of a Support Group**

#### **History and Rationale:**

The BSDI is an ambitious and a potentially important long term focal area for CTD. This initiative addresses the important role of efficient supplier and sub-contracting relationships for effective industrial growth and competitiveness. Technological competency is a key requirements in this area and Karnataka State can capture significant economic benefits by strengthening the technological content of its supplier industry and by helping large industry work more effectively with small companies. The BSDI seeks to provide technological equipment, production technologies, and management skills and expertise required by new or existing suppliers in the State to upgrade their technological capabilities. Such an initiative would facilitate efforts of large companies to identify and assist the formation of suppliers needed for their business objectives.

#### **Focus Group Members:**

The Focus Group members are primarily from the public sector with only one (retired) from private industry (Annex E).

#### **Focus Group Activities:**

The BSDI focal group held 24 meetings so far, received 9 proposals of which 8 were approved, and reports of assistance for 148 firms were unconfirmed in the project files reviewed by the team (Annex F).

The specific activities that were reported undertaken include:

- Identification of SMEs in the high tech. field in Peenya industrial estate.
- Conduct of a training program on BSDI
- Organization of a workshop on ISO 9000
- Training programs on ISO 9000
- Training programs at SISI on ISO 9000
- Participation of CTD delegates in the NCQM Seminar in bangalore
- two day workshop on ISO 9000 at Bangalore
- Participation of CTD in the Indo- US - Japan Conference

In an overall sense, the BSDI activity is well thought out and on target. A short survey of the needs of 25 firms in 1991 represented a compilation of technological needs. This survey provided some basis for beginning the activity, but the translation into action plans is unclear since activities subsequently undertaken seemed to rank low in the survey. Buyer / Supplier relationships represent a key area where efforts are needed for overall technological development and the sound of the market can be easily heard through the discourse of the buyer. However, the activities to capitalize on that potential were minimal; a very brief baseline study and the initial workshop were the most significant outputs.

Looking to the future, CTD has a number of plans will become a significant component of its work in the coming years. For example, CTD is planning to set up a model Factory of the 90s with assistance proposed to be obtained from the US NIST to improve technology levels and upgrade design and production technologies. Training programs are planned to upgrade

the capabilities of these companies and make them more effective in their dealings with large corporations. The focus that CTD was chosen for this activity is in electronics and machine tools and it plans to draw upon the resources of IISC, CMTI, FTI, GTTC, NITTF Electronics Center, KSDFC, and local chambers and associations, as well as SISI, in its work. †

Training is a major component of the BSDI initiative with the focus being on improving HRD at managerial and technical levels. Also in the plans are the establishment of common facilities for heat treatment, paint shops and CAD centers. CTD is attempting to respond to the expressed needs of local firms for assistance in upgrading their design capabilities, especially in the area of toppings and moldings. The common CAD facility is designed to meet this need. At present the plan is to establish this facility at IISC, while training programs at NGEF, NEC, and GTTC are relevant to this initiative as well.

Also in the plans is a Metrology center which will be able to recalibrate, reset, and repair measuring instruments and gauges at periodical intervals.

In order to improve access to technological services, the Technology Deployment Service was established with retired and active industry experts. It was not possible to establish how the TDS functions and delivers its services, due to minimal documentation.

Computers were supplied for setting up databases at FKCCI, GMCI, CII and CSI, and a proposal to supply them to the Peenya Industrial estate is under consideration. Meeting minutes reveal the general offer of a computer to any industrial estate for the purpose of developing a general data base.

CTD is involved with the World Bank Apex Hitech Institute, a relationship that could prove useful within the context of the BSDI.

**Analysis:**

Overall, BSDI recognizes that buyers represent an important industrial customer base that could form an active program for technology deployment. The activities of this Focus Group to date do not hold any promise that this potential will be realized.

**Recommendations:**

- CTD should develop buyers as a key component of the technology mobilization process.
- CTD must develop Measures of Performance keyed to the requirements of the Project.
- CTD must develop a Baseline Survey to determine points of leverage in the resource mobilization process.
- CTD must develop a plan of action to ensure buyer representation on all Focus Groups and other such panels, discontinuing this Support Group in favor of an integrated approach.

## **INFRASTRUCTURE**

### **A Review of a Support Group**

#### **History and Rationale:**

The rationale for developing the Infrastructure Support Group appears to be rather general and vague. The existence of such a Support Group is a recognition of the importance of basic systems for industrial development. Specifically the Support Group identified energy and water as focal points for activity.

#### **Support Group Members:**

Nine members comprise the current the Support Group (Annex E). Five of these members are from the CTD Governing Board or Secretariat, one is a CTD consultant and the remaining three are from the Central Power Research Institute (CPRI) and the Karnataka State Council for Science and Technology (KSCST). No member(s) represent industry on the Support Group.

#### **Activities Supported:**

Five activities are supported, based on few meetings of the Support Group (Annex F). Four of these activities involve seminars and / or workshops where CTD has co-sponsored or sent delegates. The seminars / workshops involved energy.

One example of such an activity is the one-day seminar co-sponsored by CTD. At this seminar, case studies of energy efficiency were presented. The seminar was presented to examine not only the extent to which conservation schemes were implemented and but also to examine ways and means to accelerate conservation schemes. The seminar was presented to thirty seven participants, eighteen of which were from the private sector.

#### **Activities Visited during the Evaluation:**

The CPRI activity was visited (see the discussion under New Materials).

#### **Analysis:**

The one major activity of the Infrastructure Support Group appears was miscategorized. The CPRI project is essentially a new materials effort, rather than an infrastructure project. Without the CPRI activity, the activities of the Infrastructure Group are limited to seminars/workshops. Energy is essential for industrial development, but it does not appear that the Infrastructure Group is well developed or has the resources to make a significant impact. A Baseline Survey to identify the current status and need appropriate to the CTD capabilities was not conducted.

#### **Recommendations:**

- CTD should disband the Infrastructure Group and capture the discussion of infrastructure needs in the context of other groups.
- CTD should classify the CPRI activity as an activity in the New Material Focus Group.
- CTD must develop a plan of action to ensure representation on all Focus Groups and other such panels, discontinuing this Support Group in favor of an integrated approach.

**United States Agency for International Development**  
New Delhi India

**Mid-Term Evaluation**

**CENTRE FOR TECHNOLOGY  
DEVELOPMENT**

(CTD 386-0507)

**ANNEX II  
BACKGROUND INFORMATION**

May 2-28, 1993

**Mid-Term Evaluation Team**  
**Eccles Associates - New York**  
**Bishop - Jones - Rajan - Mahadevan - Wad**

Annex II - 1

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## B. NARRATIVE SUMMARY

<u>Sector Goal</u>	<u>Measures of Goal Achievement</u>	<u>Means of Verification</u>
<p>Acceleration in the pace and quality of technology application to product and production process development in existing and new business in industry, agriculture, health, energy, and other areas important to Indian development.</p>	<ul style="list-style-type: none"> <li>- Improved / new technology applications to at least 30 products and production processes for domestic and export markets.</li> <li>- Cost savings in production, i.e. up to 30% of original production cost.</li> <li>- 50% of cost savings passed on to consumers</li> <li>- About 25% increase in the availability of food and other products promoted by CTD.</li> <li>- About 500 new jobs created, 50% of them for women.</li> </ul>	<ul style="list-style-type: none"> <li>- Unverifiable, reporting process yet to be put into place</li> <li>- Unverifiable, reporting process yet to be put into place</li> <li>- Unverifiable, reporting process not in place</li> <li>- Unverifiable, reporting process yet to be put into place</li> <li>- Unverifiable, reporting process yet to be put into place</li> <li>- Baseline Surveys &amp; followup are insufficient to substantiate progress.</li> <li>- Project focus to date concentrates on technician skill training &amp; academic infrastructure enhancement</li> </ul>

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<b>B. NARRATIVE SUMMARY_- continued -</b>		
<b><u>Project Purpose</u></b>	<b><i>Conditions that will indicate purpose has been achieved. End of project status.</i></b>	<b><u>Means of Verification</u></b>
<p>To develop and improve technology infrastructure resources essential for economic growth in India, initially focusing on the Bangalore area of Karnataka.</p>	<ul style="list-style-type: none"> <li>- CTD fully operational with an office, 4 - 6 staff and becomes self-sustained, interacting with key institutions (government, academic, industry, financial).</li> <li>- At least 20 new economically viable ventures involving improved technology applications, promoted by CTD.</li> <li>- CTD involving at least 6 important policy makers in this project.</li> <li>- 10 or 15 new and / or strengthened local institutions and their trained professionals engaged in R&amp;D, consultancy, HRD</li> <li>- 5 local educational institutions strengthened and 50 ex-students actively linked to new ventures.</li> </ul>	<ul style="list-style-type: none"> <li>- Operational Office &amp; 5 admin. assistants self-sustaining as goal not apparent</li> <li>- c. 3 (NAL, CMTI, CPRI)</li> <li>- c.12</li> <li>- c. 6 large</li> <li>- ICICI, TDIC</li> <li>- not apparent</li>   <li>- mostly retired</li>   <li>- GTTC, UAS (TPS), NEC, CCE</li>   <li>- GTTC, CCC, Mangalore University, NEC, IIH (in process)</li> </ul>



<b>B. NARRATIVE SUMMARY</b> - continued -		
<u>Outputs</u>	<u>Magnitude of Outputs</u>	<u>Means of Verification</u>
A. Establishing operationally effective CTD for identifying and supplying components missing from the technology infrastructure.	<ul style="list-style-type: none"> <li>- A functional CTD with an office and 4-6 staff; \$428,571 raised by CTD from local sources of 6 years LOP for its operational expenses.</li> <li>- Proposals emerging as per acceptable timeframe</li> </ul>	<ul style="list-style-type: none"> <li>- CTD established</li> <li>- 5 administrative staff</li> <li>- Projects developed from experience base of Focus Group members, esp. retired government &amp; academic</li> <li>- 152 proposals approved (out of 242)</li> </ul>
B.1 Expanded and strengthened Research & Development (R&D) base for technology development	<ul style="list-style-type: none"> <li>- At least 3 Applied Technology Centers (ATCs) established. ATCs engaging in prototype and production process design</li> </ul>	<ul style="list-style-type: none"> <li>- CPF partial functioning with AQCL at UAS.</li> <li>- CME at planning stage</li> <li>- CET greenhouse, mist chamber, tissue culture in place,</li> </ul>
B.2 Enhanced buyer-supplier relationship by promoting sub-contractings between large and small - scale industries in various sectors.	<ul style="list-style-type: none"> <li>- Facilitation by CTD of at least 10 sub-contractings based on high technology buyer's needs.</li> <li>- Improved efficiency, quality control, and flexibility among at least 10 small / medium scale industries.</li> </ul>	<ul style="list-style-type: none"> <li>- not apparent</li> </ul>
B.3 Regular technical information update system for Karnataka industry and research groups.	<ul style="list-style-type: none"> <li>- U.S. / Indian computerized technical information data bases linked through satellite telecommunications and use of this system by at least 50 firms paying fees.</li> </ul>	<ul style="list-style-type: none"> <li>- at proposal stage</li> </ul>

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<b>B. NARRATIVE SUMMARY_- continued -</b>		
<u><b>Outputs</b></u>	<u><b>Magnitude of Outputs</b></u>	<u><b>Means of Verification</b></u>
<p><b>B.4</b> Expanded and enhanced human resource base for technological innovation.</p>	<ul style="list-style-type: none"> <li>- 10-15 industry oriented courses added to Karnataka's polytechnics.</li>   <li>- Computerized learning systems added to at least 10 technical and management institutes.</li>   <li>- Around 70 top and 700 middle level R&amp;D professionals trained and engaged in training and consultancy.</li> </ul>	<ul style="list-style-type: none"> <li>- technician training programs are a major activity</li> <li>MSc Software course syllabus</li> <li>CCE (IISc) 8 module course</li> <li>GTTC &amp; NEC CNC maintenance course</li> <li>- not apparent</li>   <li>- not apparent</li> </ul>
<p><b>B.5</b> Strengthened entrepreneurship environment particularly at the small / medium scale level.</p>	<ul style="list-style-type: none"> <li>- At least 20 new viable joint ventures and / or start-up firms established and working in such fields as food processing and informatics as a result of CTD.</li> </ul>	<ul style="list-style-type: none"> <li>- not apparent</li> </ul>
<p><b>B.6</b> Effective network among key CTD institutions supporting increasing technology development &amp; application</p>	<ul style="list-style-type: none"> <li>- mobilization &amp; use of about \$100 million refunding</li> <li>- annual / biannual meetings among academic, industry, financial, &amp; public institutions</li> <li>- involvement of 6 policy makers actively in this project</li> </ul>	<ul style="list-style-type: none"> <li>- not apparent</li>   <li>- interaction between CTD different organizations in few cases, e.g. True Potato Seed &amp; perhaps Informatics</li> <li>- extensive involvement of retired policy makers</li> </ul>

<b>B. NARRATIVE SUMMARY_- continued -</b>		
<b><u>Inputs</u></b>	<b><u>Magnitude of Inputs</u></b>	<b><u>Means of Verification</u></b>
<b>A. USAID - \$10.0 million</b>		
<b>A.1 \$3.2 million</b>	<b>1. 250 personmonths (US &amp; local) for Technical Asst.</b>	
<b>A.2 \$2.5 million</b>	<b>2. 250 personmonths (US, local, 3rd country) for Training</b>	
<b>A.3 \$3.8 million</b>	<b>3. Equipment for ATCs &amp; training</b>	
<b>A.4 \$0.5 million</b>	<b>4. Publicity materials, etc.</b>	<b>- brochure, apparently limited distribution</b>
<b>B GoI &amp; Others.</b>		
<b>\$15.4 million</b>	<b>Initiate 20+ ventures from ICICI during the life of the project</b>	<b>- none to date</b>
<b>\$ 0.45 million from government &amp; industry</b>	<b>CTD operational expenses, e.g. office staff salary, etc.</b>	<b>- appears to be in place</b>

### C. ACTIVITY TIMELINE

<u>Phase 1</u>	<u>Schedule Date</u>	<u>Accomplished Date</u>
1. USAID basic PIL & approved guidelines to CTD Project Data Sheet Project Paper	1 Oct - 29 Nov 1989	3 Nov - 5 Dec 1989 29 Jul 1989 29 Jul 1989
2. Focus Groups Complete Baseline Survey - Informatics - Software - Metrology - Food Processing - Mango, Guava, Tomato - Kumaon Region - Wheat & Wheat-based - New Materials - DryLand Agriculture - Human Resources Devel. - ITI in Karnataka - Tool Industry (CMIT-B) - Venture Capital - Infrastructure - Buyer / Supplier	1 Oct - 30 Jan 1990	Jul 1989
3. Focus Groups complete Phase I Action Plan - Informatics - Food Processing - New Materials - DryLand Agriculture - Human Resources Devel. - Venture Capital - Infrastructure - Buyer / Supplier	1 Oct - 30 Jan 1990	Jul 1989

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	<b>C. ACTIVITY TIMELINE</b> - continued -	
<b>Phase I</b>	<b>Schedule Date</b>	<b>Accomplished Date</b>
4. CTD meets conditions precedent Funding released CTD Staff in place		29 Mar 1993
5. CTD send quarterly administrative reports to USAID  Monthly Monthly Monthly Monthly Monthly Monthly Monthly Monthly  Qtr Rpts 1/1/90-31/3/92	31 Mar 90 30 Jun 90 30 Sep 90 31 Dec 90 31 Mar 91 30 Jun 91 30 Sep 91 31 Dec 91 31 Mar 92  30 Jun 92 30 Sep 92 31 Dec 92 31 Mar 93	4 Apr 1990 28 Jun 1990 8 Oct 1990 4 Jan 1991 15 Apr 1991 19 Jul 1991 24 Oct 1991 20 Feb 1991 6, 21 May 1992 27Apr 1992 15 Jul 1992 27 Oct 1992 27 Jan 1993 30 Apr 1993
6. USAID / I Quarterly Monitoring Reports       Lack Budget, Finan.Status	31 Mar 90 30 Jun 90 30 Sep 90 31 Dec 90 31 Mar 91 30 Jun 91 30 Sep 91 31 Dec 91 31 Mar 92 30 Jun 92 30 Sep 92 31 Dec 92 31 Mar 93	5 May 1992

<b>C. ACTIVITY TIMELINE</b> - continued -		
<b>Phase I</b>	<b>Schedule Date</b>	<b>Accomplished Date</b>
7. CTD Approves & send Phase I Action Plan to USAID/ Board Approval	31 Jan - 27 Feb 1990	7 Jul 1990 28 Jul 1990
8. USAID/I reviews Phase I Action Plan & concurs Accepted in principal, requires modification including Scope of Work for MSS, specific project proposals as developed, Board approval	28 Feb - 30 Mar 1990	16 Jul 1990 not available
9. Training for CTD staff in AID procedures / contracting Financial Review & Analysis	28 Feb - 30 Mar 1990 19 Dec 1989	completed completed
10. Based on Action Plan, CTD prepares near-term proposals	31 Mar - 30 May 1990	May 1990
11. USAID reviews specific proposals & issues PIL	31 May - 29 Jun 1990	
12. CTD implements near-term proposals - seminars & study tours - prelim. training schemes - hire TA for MSSs - procure equipment for training and demonstration	31 Jun - 30 Dec 1990	
13. Complete MSSs - Ctr Processed Foods - Ctr Mfg. Engineering - Ctr Elete Trees	31 Jul - 30 Dec 1990	- not available Feb 1993 - not available

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<b>C. ACTIVITY TIMELINE</b> - continued -		
<b>Phase I</b>	<b>Schedule Date</b>	<b>Accomplished Date</b>
14. Based on MSSs, CTD implements other proposals 14a Procure equip for ATCs - Ctr Processed Foods Society formation Board of Directors Analytical Lab open - Ctr Mfg. Engineering - Ctr Elete Trees  14b Human Res. Development - Curriculum - Scholar-in-Residence	ongoing	Feb 1993 12 May 1993 fall 1992 spring 1993  greenhouse / mist chamber tissue lab 1992-3  not apparent
<b>Phase II</b>	<b>Schedule Date</b>	<b>Accomplished Date</b>
15. Focus Group Phase II Action Plan - Ctr Processed Foods - Ctr Mfg. Engineering - Ctr Elete Trees CTD Approval	1 Apr - 29 Jun 1991	prelim. 6 Sep 1990 14 Jun 1991
16. USAID gives concurrence to Phase II Action Plan	30 Jun - 1 Aug 1991	29 Jun 1991
17. CTD prepares Phase II Proposals for USAID funding	2 Aug - 30 Nov 1991	
18. USAID/I reviews Proposals for USAID funding	31 Nov - 30 Dec 1991	

as

<b>C. ACTIVITY TIMELINE</b> - continued -		
<b>Phase II</b>	<b>Schedule Date</b>	<b>Accomplished Date</b>
19. CTD Implements Phase II Proposals, e.g.		
19a CTD/ATCs coordinate new ventures		
Cir Tech Development		none to date
Cir Processed Foods		none to date
Cir Mfg. Engineering		none to date
Cir Elete Trees		none to date
19b TA for New Ventures	1 Apr 1992 - ...	none to date
19c New Ventures Started	1 Apr 1992 - ...	none to date
Incr. Product / Market	1 Apr 1992 - ...	none to date
19d On-site Training		not available
20. Mid-Term Evaluation	1 Sep - 30 Sep 1992	1 - 28 May 1993

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**D. FOCUS and SUPPORT GROUP ACTIVITY SUMMARY**  
 March 31, 1993

	<u>Meetings Held</u>	<u>Proposals</u>		<u>Start -ups Assisted</u>	<u>Products/ Services Commer- cialized</u>
		<u>Received</u>	<u>Approved</u>		
<b>Focus Groups</b>					
Informatics	106	116	69	12	0
Food Processing	74	47	36	5	0
New Materials	14	15	8	2	0
Dryland Agriculture	52	37	16	6	0
<b>Support Groups</b>					
Human Resource	27	8	6	2	0
Buyer / Supplier	24	9	8	148	0
Infrastructure	16	12	6	2	0
<u>Venture Capital</u>	<u>8</u>	<u>5</u>	<u>4</u>	<u>0</u>	<u>0</u>
<b>TOTAL</b>	<b>321</b>	<b>249</b>	<b>153</b>	<b>177</b>	<b>0</b>

**Summary Ratios**

	<u>Proposals / Meeting</u>	<u>Approval Rate</u>	<u>Startup / Approval</u>	<u>Products Startup</u>
<b>Focus Groups</b>				
Informatics	1.09	0.59	0.11	0
Food Processing	0.64	0.77	0.12	0
New Materials	1.07	0.53	0.14	0
Dryland Agriculture	0.71	0.43	0.12	0
<b>Support Groups</b>				
Human Resource	0.30	0.75	0.07	0
Buyer / Supplier	0.38	0.89	6.17	0
Infrastructure	0.75	0.50	0.12	0
<u>Venture Capital</u>	<u>0.62</u>	<u>0.80</u>	<u>--</u>	<u>0</u>
<b>TOTAL</b>	<b>0.78</b>	<b>0.61</b>	<b>1.16</b>	<b>0</b>

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### E. FOCUS and SUPPORT GROUP MEMBERSHIP

	<u>CTD</u>	<u>Info</u> <u>mat</u>	<u>Food</u> <u>Pro.</u>	<u>Dry</u> <u>Land</u>	<u>New</u> <u>Matl</u>	<u>Hum</u> <u>Res</u>	<u>Buy/</u> <u>Supr</u>	<u>Infr-</u> <u>strl</u>	<u>Vent.</u> <u>Cap.</u>
Acharya, S. P.			ShawWall.						
Alyar, A. S.			Godrej						
Bajjal, J. S.						WorldBnk			
Bhat, K. H.			Cnstl						
Deshmukh, V.		X							
Dwarakanath, R.				UAS					
Ganguly, B.		NTTF				NEC			
Gowda, C.			X						
Hegde, B. R.				UAS					
Kale, R. D.				UAS					
Kaul, P. K.						X			
Khan, M. M.				UAS					
Krishnamurthy, M. V.		X							X
Krishnamurthy, H.		X							
Madhusudan, K. V.		X			GTTC				
Mani, N. S.			Krntk.	Krntk.					
Melanta, K. R.				UAS					
Murching, M. M.		CMTI				CMTI	CMTI		
Murthy, K. S. N.	A.Dir	CTD	CTD	CTD	CTD	CTD	CTD	CTD	
Nadkarni, K. S.									TDICI
Nagarajan, S.		X							
Naik, K. S.				Cnslt					
Narasimha, R.				NAL					
Nayak, K. R.		ManU				ManU			
Nayak, P. C.	Director	CTD	CTD	CTD	CTD	CTD	CTD	CTD	CTD
Pai, G. L.		X							
Parameshwaran, S.							CPRI		
Parameshwarappa				X					
Prabhakaran, K. P.					NGEF				
Prabhala, S.		Bharat							
Prahlad, S. N.			Wimco						

**E. FOCUS and SUPPORT GROUP MEMBERSHIP**

- continued -

	<u>CTD</u>	<u>Info mat</u>	<u>Food Pr.</u>	<u>Dry Land</u>	<u>New Matl</u>	<u>Hum Res</u>	<u>Buy/ Supr</u> KSCST	<u>Infr- strt</u>	<u>Vent. Cap.</u>
Rajagopaian, S.									
Ramachandra, S. G.	Board	CTD				CTD		CTD	
Ramanna, B. V.					Bharat NAL				
Rao, R. M. V. G. K.									
Rao, N. J.		X							
Rao, P. R.	A.Dir.	CTD	CTD	CTD	CTD	CTD	CTD CPRI	CTD	CTD
Rarnamoorthy, M.									
Rudrappa, B. G.		X	X					X	
Sampath, S. R.		X							
Sarma, G. R.	Board	CTD	CTD			CTD		CTD	
Savadatti, M. I.		X							
Seshadri, C. K.		Cnslt				Cnslt	Cnslt		
Shenoy, R. P.		X							
Shukla, V. S.		X							
Soota, A.		X							
Srinivasa, U.		X							
Srinivasan, R.		NAL			NAL				
Subbaiah, T. K.				UAS					
Sulladmath, U. V.			UAS						
Sundar, S. S.			Krnk.	Krnk.					
Taneja, K. K.						DGTD			
Thimmaraju, K. R.			UAS	UAS					
Venkatdas, J.									CVCF
Vishwanathan, R.							KSFC		
Viswanadham, N.		X							
Viswanath, G. V.	Finance		CTD	CTD			CTD		

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**F. SUMMARY OF QUARTERLY REPORTS**

<b>NEW MATERIALS</b> <u>Activities</u>	<u>1990</u>				<u>1991</u>				<u>1992</u>			<u>'93</u>	
	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>
Focus Group	1	2	1	3	1	1				1	2	2	
Proposals													
Received	1		1	3		2	2	3		1			2
Accepted	1						2	2		1			2
Business Assisted													2
Individuals Trained								x					
Study Tour	--	--	--	--	--	--	--	--	--	--	--	--	--
Consulting Days	--	--	--	--	--	--	--	--	--	--	--	--	--
Curric.Developed								1					
Conf/Semn/Wrkshps	--	--	--	--	--	--	--	--	--	--	--	--	--
JV Startups	--	--	--	--	--	--	--	--	--	--	--	--	--
Prod.Commercialized	--	--	--	--	--	--	--	--	--	--	--	--	--
Post Activity	--	--	--	--	--	--	--	--	--	--	--	--	--
Expenditures:													
000'sRs Qtr			3.6		.8		7	1	35		526		
Cumulative			4	4	4	4	11	12	47	47	573	573	
Industry %	--	--	--	--	--	--	--	--	--	--	--	--	--

<b>DRYLAND</b> <b>AGRICULTURE</b> <u>Activities</u>	<u>1990</u>				<u>1991</u>				<u>1992</u>			<u>'93</u>	
	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>
Focus Group	1		8	8	2	9	4	8	4	1	5		2
Proposal													
Received	1		8	8	2	1	3	3		1	3		7
Accepted			1	3			2	2		1	3		4
Business Asstd					(2)	(1)	3						
Indiv.Train.					300				8				
Study Tour	--	--	--	--	--	--	--	--	--	--	--	--	--
Consult.Days				30	30	30	30	30	30	30			
Curric.Devlpd	--	--	--	--	--	--	--	--	--	--	--	--	--
Conf/Semn/Wrk					2								
JV Startups	--	--	--	--	--	--	--	--	--	--	--	--	--
Prod.Commlzd	--	--	--	--	--	--	--	--	--	--	--	--	--
Post Activity	--	--	--	--	--	--	--	--	--	--	--	--	--
Expenditures:													
000'sRs Qtr		36	20	50	21	21	248	896	30	14			
Cumulative		36	55	105	125	146	394	1290	1320	1334	1334	1334	
Industry %	--	--	--	--	--	--	--	--	--	--	--	--	--

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## F. SUMMARY OF QUARTERLY REPORTS

- continued -

<b>FOOD PROCESSING</b> <u>Activities</u>	<u>1990</u>				<u>1991</u>				<u>1992</u>				<u>'93</u>
	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>
Focus Group	1	2	6	2	2	3	9	5	12	9	5	5	13
Proposal													
Received	2	3	3	1	1	4	4	4	2	5	5	3	10
Accepted	2	2	3	1	1	3	2	4	2	3	3	2	8
Business Asstd			1		1		(1)			(1)	(1)		
Indiv.Train.	25		16			61		6					
Study Tour	--	--	--	--	--	--	--	--	--	--	--	--	--
Consult.Days		30	30	30	30	50	50	50	90				
Curric.Devlpd	--	--	--	--	--	--	--	--	--	--	--	--	--
Conf/Semn/Wrk	1	3	2	1	2	1	2	2	2				
JV Startups	--	--	--	--	--	--	--	--	--	--	--	--	--
Prod.Commlzd	--	--	--	--	--	--	--	--	--	--	--	--	--
Post Activity	--	--	--	--	--	--	--	--	--	--	--	--	--
Expenditures:													
000'SRs Qtr	25	60	399	34	312	108	230	1,842	343		206		42
Cumulative	25	85	484	519	831	938	1,168	3,011	3,354	3,354	3,560	3,560	3,602
Industry %	--	--	--	--	--	--	--	--	--	--	--	--	--

<b>INFORMATICS</b> <u>Activities</u>	<u>1990</u>				<u>1991</u>				<u>1992</u>				<u>'93</u>
	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>
Focus Group	6	3	5	2	7	6	13	12	18	8	8	5	13
Proposal													
Received	6	6	4	3	6	2	9	4	13	10	7	12	34
Accepted	2	3	4	4	5	2	3		5	5	5	12	19
Business Asstd										1		8	3
Indiv.Train.		63		147	96	127	84	111	20		5		
Study Tour				3									
Consult.Days		30	40	40	30	90	90	120	120				
Curric.Devlpd				1					1				
Conf/Semn/Wrk		3		7	3	3	4	4	6				
JV Startups	--	--	--	--	--	--	--	--	--	--	--	--	--
Prod.Commlzd	--	--	--	--	--	--	--	--	--	--	--	--	--
Post Activity	--	--	--	--	--	--	--	--	--	--	--	--	--
Expenditures:													
000'sRs Qtr		332	802	2315	2,477	1772	249	415	1,459	456	189		218
Cumulative		332	1,134	3,449	5,926	7,698	7,947	8,362	9821	10277	10466	10466	10684

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## F. SUMMARY OF QUARTERLY REPORTS

- continued -

<b>HUMAN RESOURCES</b> <u>Activities</u>	<u>1990</u>				<u>1991</u>				<u>1992</u>				<u>'93</u>
	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>
Support Group										1	2		5
Proposal													
Received										1	1		1
Accepted											1		1
Business Asstd													2
Indiv.Train.	--	--	--	--	--	--	--	--	--	--	--	--	--
Study Tour	--	--	--	--	--	--	--	--	--	--	--	--	--
Consult.Days	--	--	--	--	--	--	--	--	--	--	--	--	--
Curric.Devlpd	--	--	--	--	--	--	--	--	--	--	--	--	--
Conf/Semn/Wrk	--	--	--	--	--	--	--	--	--	--	--	--	--
JV Startups	--	--	--	--	--	--	--	--	--	--	--	--	--
Prod.Commlzd	--	--	--	--	--	--	--	--	--	--	--	--	--
Post Activity	--	--	--	--	--	--	--	--	--	--	--	--	--
Expenditures:													
000'sRs Qtr										21	21	15	20
Cum										21	41	56	77
Industry %	--	--	--	--	--	--	--	--	--	--	--	--	--

<b>BUYER / SUPPLIER</b> <u>Activities</u>	<u>1990</u>				<u>1991</u>				<u>1992</u>				<u>'93</u>
	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>
Support Group													3
Proposal													
Received											1	1	1
Accepted												1	1
Business Asstd	--	--	--	--	--	--	--	--	--	--	--	--	--
Indiv.Train.	--	--	--	--	--	--	--	--	--	--	--	--	--
Study Tour	--	--	--	--	--	--	--	--	--	--	--	--	--
Consult.Days	--	--	--	--	--	--	--	--	--	--	--	--	--
Curric.Devlpd	--	--	--	--	--	--	--	--	--	--	--	--	--
Conf/Semn/Wrk	--	--	--	--	--	--	--	--	--	--	--	--	--
JV Startups	--	--	--	--	--	--	--	--	--	--	--	--	--
Prod.Commlzd	--	--	--	--	--	--	--	--	--	--	--	--	--
Post Activity	--	--	--	--	--	--	--	--	--	--	--	--	--
Expenditures:													
000'sRs Qtr										22			1
Cum										22	22	22	24
Industry %	--	--	--	--	--	--	--	--	--	--	--	--	--

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**F. SUMMARY OF QUARTERLY REPORTS**

- continued -

<b>INFRASTRUCTURE</b>	<u>1990</u>				<u>1991</u>				<u>1992</u>				<u>'93</u>
	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>
<b>Activities</b>													
Support Group										1		1	
Proposal													
Received										1		1	
Accepted										1		1	
Business Asstd											1	1	1
Indiv.Train.	--	--	--	--	--	--	--	--	--	--	--	--	--
Study Tour	--	--	--	--	--	--	--	--	--	--	--	--	--
Consult.Days	--	--	--	--	--	--	--	--	--	--	--	--	--
Curric.Devlpd	--	--	--	--	--	--	--	--	--	--	--	--	--
Conf/Semn/Wrk	--	--	--	--	--	--	--	--	--	--	--	--	--
JV Startups	--	--	--	--	--	--	--	--	--	--	--	--	--
Prod.Commlzd	--	--	--	--	--	--	--	--	--	--	--	--	--
Post Activity	--	--	--	--	--	--	--	--	--	--	--	--	--
<b>Expenditures:</b>													
000'sRs Qtr										835			5
Cum										835	835	835	840
Industry %	--	--	--	--	--	--	--	--	--	--	--	--	--

<b>VENTURE CAPITAL</b>	<u>1990</u>				<u>1991</u>				<u>1992</u>				<u>'93</u>
	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q1</u>
<b>Activities</b>													
Support Group										2			
Proposal													
Received											2	1	
Accepted											1	1	
Business Asstd	--	--	--	--	--	--	--	--	--	--	--	--	--
Indiv.Train.	--	--	--	--	--	--	--	--	--	--	--	--	--
Study Tour	--	--	--	--	--	--	--	--	--	--	--	--	--
Consult.Days	--	--	--	--	--	--	--	--	--	--	--	--	--
Curric.Devlpd	--	--	--	--	--	--	--	--	--	--	--	--	--
Conf/Semn/Wrk	--	--	--	--	--	--	--	--	--	--	--	--	--
JV Startups	--	--	--	--	--	--	--	--	--	--	--	--	--
Prod.Commlzd	--	--	--	--	--	--	--	--	--	--	--	--	--
Post Activity	--	--	--	--	--	--	--	--	--	--	--	--	--
<b>Expenditures:</b>													
000'sRS Qtr												18	
Cum												18	18
Industry %	--	--	--	--	--	--	--	--	--	--	--	--	--

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## G. SUMMARY OF EXPENDITURES

<u>Operating</u>	<u>3/31/90</u>	<u>3/31/91</u>	<u>3/31/92</u>	<u>3/31/93*</u>	<u>3/31/94</u>
Salary & Comm.	30,000	17,000	22,000		
Prof. Fees	3,500	10,500	17,500		
Honorarium	9,000	28,500	28,000		
Post., Tele.,	10,979	42,237	6,108		
Local Convey.	2,988	951	13,658		
Secy. Charge	15,000	30,000	41,500		
Print & Stat.	8,975	4,302	6,047		
Conf. & Conv.	14,952	5,878	27,402		
General	--	--	15,336		
Audit	500	1,000	3,000		
Tax & Duty	--	--	46,570		
Computer Maint.	--	--	4,496		
Books & Period.	--	278	312		
Office Maint.	--	--	32,890		
Miscellaneous	471	1,708	20,182		
Furniture Depr.	--	778	3,895		
<b>TOTAL OPERATING</b>	<b>96,365</b>	<b>143,132</b>	<b>288,896</b>		
 Transfer to Capital	 7,534	 61,927	 38,809		
 <u>Technical Assistance</u>		<u>3/31/91</u>	<u>3/31/92</u>	<u>3/31/93*</u>	<u>3/31/94</u>
Centre Processed Foods		198,070	144,537	188,858	
Centre Mfg. Engineering		--	770,228	16,414	
Consultancies		344,500	721,500	509,664	
Mission & Scope Studies			62,886	nil	
Focus Groups		68,527	167,879		
Support Groups			61,282	nil	
Focus & Support Groups				539,336	
Seminar Expenses		323,305	462,524	676,757	
Peenya Indl. Estate		187,906	nil	20,628	
Study Team				302,240	
Metrology				25,000	
CSIC-CTD Library				117,248	
<u>Activities in M.P.</u>				<u>98,354</u>	
<b>TOTAL TECH.ASST.</b>		<b>1,122,308</b>	<b>2,390,836</b>	<b>2,494,499</b>	

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## G. SUMMARY OF EXPENDITURES

- continued -

<u>Training</u>	<u>3/31/91</u>	<u>3/31/92</u>	<u>3/31/93*</u>	<u>3/31/94</u>
Computer Training Courses	515,612	451,705	1,343,592	
Human Resources Devel.	172,724	23,628	36,402	
Continuing Education Ctr.	nil	667,091	769,884	
Community College	nil	179,377	444,400	
Tissue Culture	nil	228,355	677,109	
Women in Development	nil	368,297	nil	
8 Module Computer Training	650,000	nil	25,462	
Low cost chemistry equipment	287,792	nil	nil	
MEI Polytechnic	260,000	nil		
Workshops	75,901			
1) Venture Capital		31,997		
2) Fruit & Veg. Processing		13,500		
3) New Economic Policy		46,048		
4) FTI		27,639	4,708	
5) Tomato			5,418	
6) Expert Systems			15,279	
7) STEP			20,000	
8) Tooling Industry			10,275	
9) ZOPP			3,656	
10) Dryland Development			10,000	
11) Synapse			17,275	
12) Process Control			725	
13) FTI Future programme			7,969	
14) FTI ISO 9000			10,203	
15) Integrated Fruit & Veg. Process			39,693	
16) KSCST			5,000	
CNC Training			1,249,168	
ATC Tree Crops			1,310,000	
MSc. Software			2,300,157	
Trng.Greenhouse & Mist Chmbr.			30,440	
DTP for Women			193,900	
<u>Training in Law</u>			<u>22,591</u>	
<b>TOTAL TRAINING</b>	<u>1,962,029</u>	<u>2,037,637</u>	<u>8,553,306</u>	

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## G. SUMMARY OF EXPENDITURES

- continued -

<u>Commodities</u>	<u>3/31/91</u>	<u>3/31/92</u>	<u>3/31/93*</u>	<u>3/31/94</u>
Greenhouse & Mist Chamber		893,024	1,077,054	
NEC & GTTC - CNC Maint.	4,000,000	1,446,060	130,000	
AWAKE	350,000	nil	nil	
NTTF Electronic Pgm PC	90,000	nil	nil	
CTD Digital Educ. Centre			1,000,000	
CNC Programming			2,700,000	
CPRI Pilot Plant			835,000	
Facility for ASIC design			980,000	
CNC Main. Training Pgm.			130,000	
Rapid Product Devel. Ctr.			440,000	
<b>TOTAL COMMODITIES</b>	<b>4,440,000</b>	<b>2,339,084</b>	<b>7,292,054</b>	

<u>Monitoring &amp; Evaluation</u>	<u>3/31/91</u>	<u>3/31/92</u>	<u>3/31/93*</u>	<u>3/31/94</u>
Baseline Survey	5,000	68,100	75,000	
Mgt. Info. Systems	nil	225,650	184,854	
Monitoring & Eval. Honor.			47,468	
Evaluation of Programmes			76,694	
<b>TOTAL MONITORING &amp; EVAL.</b>	<b>5,000</b>	<b>293,750</b>	<b>384,016</b>	

Sources: \* Centre for Technology Development Annual Report 1991-92, 10 November 1991, G. Kulather;  
Centre for Technology Development (personnal communication, May 17, '93).

**H. SUMMARY OF EXPENDITURES**  
**Project Report Summaries**

<u>Training</u>	<u>3/31/90</u>	<u>3/31/91</u>	<u>3/31/92</u>	<u>3/31/93*</u>	<u>3/31/94</u>
Computer			451,705		
Training Ctrs				2,500,000	
Software Course					5,000,000
DK PC Exhibitn.				50,000	50,000
DK Computer				1,000,000	1,000,000
CAD Tools				800,000+\$100K	
Human Resources			23,678		
R&D Mgt. & Entrepren.				1,000,000	
Continuing Educ.			667,091		
Community Coll.			179,377		
Tissue Culture			228,355	1,250,000	2,000,000
Women in Develop.					
GTTC					1,000,000
Mangalore Polytech.					1,000,000
Electronics					1,000,000
Women			368,297		
Trainers				1,500,000	
WID - Electronics					
GTTC & Mangalore					
Polytechnic				2,000,000	
- Fruit & Veg.Process.				500,000	
Food Processing				300,000	300,000
Dryland Development				200,000	200,000
Wormiculture					500,000
True Potato Seed					3,000,000
LowCost Physics Equip				100,000	
Composites					500,000
HiTech Apex Train.Ctr.					2,000,000
Workshops				250,000	500,000
Venture Capital			31,997		
Fruit/Veg.Process			13,500		
New Econ.Policy			46,048		
Foreman Train.Inst.			<u>27,639</u>		
<b>TOTAL TRAINING</b>			<u>2,038K</u>	11,450K +\$100K	18,050K

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## H. SUMMARY OF EXPENDITURES

### Project Report Summaries

- continued -

<u>Technical Assistance</u>	<u>3/31/92</u>	<u>3/31/93*</u>	<u>3/31/94</u>
Ctr.Processed Food	144,537		
Ctr.Mfg.Engrng.	770,228		
Tech.Assist.CPF/CME		1,000,000	
Consultancies	721,500		
Upgrading ITI/FTI			200,000
Buyer/Supplier Devel.			
CAD Facility (\$75,000)			
Heat Treatment			
Metrology Ctr (20 million)			
Focus Groups	167,879	250,000	120,000
Mission & Scope Studies	62,886		
Support Groups	61,282		1,000,000
Seminars	462,524	1,000,000	
Upgrad.ITI facilities		500,000	
Peenya Indust.Estate		340,000	
Study Missions		400,000+ \$4K	1,200,000
Int'l.Bakery Trng.Inst.		50,000	40,000
Indiv.Consultancies		250,000	660,000
CAFT Consultancy		\$40,000	\$120,000
non Karnataka		1,000,000	2,000,000
Computer.Regional Png.		100,000	
Infrastr.Analytical Lab		50,000	
Solar Refriger.-Feasibl.		250,000	
ATC Tech.Assistance			2,000,000
Technical Library			2,500,000
Metrology Ctr			
Surveys			25,000
CEDOK & TEKSOK			
CEDOK			?
TEKSOK			1,500,000
Expert Sys.& Art.Intel.			5,000,000
UAS Dharwar Dryland			500,000
Venture Capital			15,000,000
FMS-Widia-Digital			2,000,000
<u>Society Support</u>			<u>550,000</u>
<b>TOTAL TECH.ASSISTANCE</b>	<u>2,391K</u>	<u>5,190K</u> +\$44K	<u>34,295K</u> +\$120K

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## H. SUMMARY OF EXPENDITURES

### Project Report Summaries

- continued -

<u>Commodities</u>	<u>3/31/92</u>	<u>3/31/93*</u>	<u>3/31/94</u>
Greenhs.& MistChmbr	893,024	1,750,000	2,000,000
UAS Dharwar			3,000,000
CNC Maintain	1,446,060		2,000,000
NEC & GTTC			
CNC Training			
GTTC Vert.Mach.Ctr.		3,000,000	
CNC Trainer			2,000,000
GTTC, MEI, Hebich			
Tools & Mold Devel.Ctr		2,000,000	
CMTI - Tooling		2,000,000	
ASIC Design			
Hardware / Software		2,000,000	
Hebich Tech.Trng.Inst.		1,700,000	
ESTC & MEI Train.Mach.		1,400,000	
CMTI Tooling Inst.			3,000,000
GTTC Desktop Publish. Women			250,000
KREC CNC retrofit lathe		1,500,000	
KREC AutoCAD & CTTC/CCC			
KREC			600,000
Canara Community Center		3,500,000	
Electronics Lab Study		1,000,000	
Canara Comm.College DEC Ctr.			5,000,000
NEC Rapid Product Develop.		1,000,000	
NAL			1,000,000
IISc Vegetable Reproduction		5,000,000	
Centre Processed Foods		1,000,000	
CPRI Pilot Plant		700,000	
<u>Horticulture Information Center</u>		<u>5,000,000</u>	
<b>TOTAL COMMODITIES</b>	<u>2,339K</u>	<u>37,800K</u>	<u>13,600K</u>

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## H. SUMMARY OF EXPENDITURES

### Project Report Summaries

- continued -

<u>Monitor &amp; Evaluation</u>	<u>3/31/92</u>	<u>3/31/93*</u>	<u>3/31/94</u>
Baseline Survey	68,100	100,000	
Mgt.Info.Systems	225,650	150,000	
M&E Unit		120,000	5,000,000
Midterm Eval.			500,000
<u>Dryland Devel.Film</u>			<u>200,000</u>
<b>TOTAL MONITOR &amp; EVALUATION</b>	<u>293,750</u>	<u>370,000</u>	<u>5,700,000</u>

<u>Technical Information</u>	<u>3/31/92</u>	<u>3/31/93*</u>	<u>3/31/94</u>
<u>Exchange</u>			
Technical Library		500,000	
4 workstations			
ASIC/PCB design			?
NAL			
Training			?
Composite Testing			\$200,000
IISc			
Buyer/Seller			?
<u>Workstation</u>			<u>\$80,000</u>
<b>TOTAL TECH.INFO.EXCHANGE</b>		<u>500,000</u>	<u>\$280,000+</u>

	<u>3/31/90</u>	<u>3/31/91</u>	<u>3/31/92</u>	<u>3/31/93*</u>	<u>3/31/94</u>
<b>TOTAL CTD</b>			7,062K	55,310K	71,645K+
as per Qtr. Reports				+ \$144K	\$500K+

Source: CTD, Personnel Communication, May 17, 1993.

\* Center for Technology Development Annual Report 1991-92, 10 November 1991, G. Kulather.

\*\* Estimated Budget for Activities Proposed in CTD Annual Action Plan for IFY 1992-93, c. 7 May 1992, unsigned.

1/10

## I. SUMMARY of MEETINGS / SITE VISITS / INTERVIEWS

### 5/4/93 USAID

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### 5/5/93 USAID

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John Aron Grayzel, J.D., Ph.D., Director  
Office of Technology Development & Enterprise  
United States Agency for International Development  
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FAX: 91 11 686-8594

Mahmohan Ready, Project Officer  
United States Agency for International Development  
New Dehli - 100 016

## I. SUMMARY of MEETINGS / SITE VISITS / INTERVIEWS

- continued -

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Office of Technology Development & Enterprise  
United States Agency for International Development  
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FAX: 91 11 686-8594

**5/6/93 Delhi Focus Group**

**P.C.Nayak**

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PHD House  
Opp Asian Games Village  
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Phone: 666-073  
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Technology Information, Forecasting &  
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Phone: 666-073

## I. SUMMARY of MEETINGS / SITE VISITS / INTERVIEWS

- continued -

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Ministry of Industry

Udyog Bhawan

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**Lt.Gen. R. N. Mahajan, Retd.**

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NOIDA - 201 301 UP

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**Brigadier Satish K. Issar, VSM (Retd)**

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**Guy E. Olson, Editor-in-Chief**

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**Dr. Nisha Sahai Achuthan, Commissioner**

Tourism & Hill Development

Advisor, Cultural Affairs

UP Government

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**A. P. Venkateswaran, Research Professor**

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## I. SUMMARY of MEETINGS / SITE VISITS / INTERVIEWS

- continued -

### V. Raghuraman, Secretary General

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YMCA Cultural Centre-cum-Library, 4th Floor  
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FAX: 011 31-2193

### 5/8/93 Government Tool & Training Centre (an Indo-Danish Project)

#### Dr. A. Parthasarathy, Director

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FAX: 0812 301 683

#### K. V. Madhusudhan, General Manager (Projects)

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#### K. S. N. Murthy, Indian Administrative Service, retd.

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### 5/10/93 True Potato Seed Project

#### Dr. J. S. Grewal, Director

Central Potato Research Institute  
Indian Council of Agricultural Research  
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Phone 5016, 78-088

#### Dr. Mahesh D. Upadhyya, Ph.D., Regional Director

South-West Asia Region  
IARI Campus  
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Phone: 574-8055

#### Dr. K. L. Chadha, Deputy Director General

Horticulture  
Indian Council of Agricultural Research  
Krishi Bhawan  
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Phone: 38-2306

## I. SUMMARY of MEETINGS / SITE VISITS / INTERVIEWS

- continued -

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Indian Forest Service (retd.)

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**Dr. U. V. Sulladmath, Ph.D., Professor**

Head of Division of Horticulture

University of Agricultural Science

GKVK

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**Dr. V. Sankaran**

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**Dr. P. C. Gaur, Project Coordinator**

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CPRI

Shimla

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**Dr. M. M. Rao, Professor**

Horticulture

UAS

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**Dr. B. B. Madalageri, Horticulturist**

UAS

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**K. K. Taneja**

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**B. A. Channappa**

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**M. D. Hopcoms**

Phone 697 552

**Jagpal Singh**

C.P.R. Sine Modipuram 250 110

Phone 777 112

## I. SUMMARY of MEETINGS / SITE VISITS / INTERVIEWS

- continued -

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B. G. Rudrappa

Phone 633 366

K. S. Karnic

Department of Horticulture

Phone 606 191

G. V. Viswanath

Phone 628 051

K. R. Thimma Raju

Phone 330 153, 330 287

P. C. Nayak

Col. C. K. Seshadri

Phone 649 402

Dr. R. M. Pandey, Director

IIHR

Bangalore

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Dr. M. M. Khan, Professor

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Dr. K. G. Shambulingappa, Director of Research

UAS

Bangalore

Phone 330 153, 330 261

Dr. M. A. Singlachar, Associate Director of Research

UAS

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Phone 330 153, 330 261

**5/11/93 Central Power Research Institute (CPRI)**

Dr. A. Ramamurthy, Director

CPRI

Mustafa Wajid, Executive Director

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## **I. SUMMARY of MEETINGS / SITE VISITS / INTERVIEWS**

- continued -

### **5/11/93 National Aeronautical Laboratory**

**Dr. R. M. V. G. K. Rao, Ph.D., Head**  
Fiber Reinforced Plastics Pilot Plant  
Advanced Composites Facility  
Materials Science Division  
National Aeronautical Laboratory  
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FAX 560 862

### **5/11/93 Naltech Board of Directors**

**Prof. Roddam Narasimha, Director**  
National Aeronautical Laboratory  
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FAX (0812) 560 862, 570 670

**Dr. R. Srinivasan, Deputy Director**  
Head, Computer Centre  
National Aeronautical Laboratory  
P.B. 1779  
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Phone 563 410  
FAX (0812) 560 862

**Dr. R. P. Shenoy, Director (Retd)**  
LRDE (Retd)

**N. D. Prabhu, Chairman (Retd)**  
Canara Bank

## I. SUMMARY of MEETINGS / SITE VISITS / INTERVIEWS

- continued -

### 5/12/93 Centre for Processed Foods (CPF) Board

P. C. Nayak, Director, CTD  
Shyamsunder, CTD Consultant  
R. A. Naik, Resource Person  
K. S. N. Murthy, Associate Director, CTD  
R. Dwarkanath  
U. V. Sulladmath, CTD  
G. V. Viswanath, CTD  
Prof. M. V. Krishnamurthy, Chairman, CSIC - IISc  
P. Padmanabhu, Director, CPF  
L. Lakshminayanayan, Director, CPF  
S. P. Acharye, Chairman, CPF  
S. N. Prahlad, Vice Chairman, CPF  
K. K. Taneja, Ex DDG (DCTD) & V.P. CMTI  
S. R. Sampath  
A. S. Aiyar, Director, CPF  
S. K. Bhat, CTD Consultant  
P. D. Shedde, Assistant General Manager ICICI  
N. S. Mann, CTD Consultant  
G. S. Jog, CPF

### 5/12/93 Indian Institute of Horticultural Research

Dr. Foja Singh, Ph.D., Head  
Division of Ornamental Crops  
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### 5/13/93 Informatics Focus Group

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Bangalore - 560 066  
Phone: 452 011  
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## I. SUMMARY of MEETINGS / SITE VISITS / INTERVIEWS

- continued -

- Dr. R. Srinivasan, Deputy Director  
Head, Computer Centre  
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- N. Krishna Kumar, Chief Marketing Officer  
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- V. R. Govindarajan, Software Specialist  
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### 5/13/93 Draft Technology Policy

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FAX: 91 080 581 694

## I. SUMMARY of MEETINGS / SITE VISITS / INTERVIEWS

- continued -

- G. R. Sarma, Advisor  
AEG Aktiengesellschaft  
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- Dr. K. R. Srinivasan, Managing Director  
Systems Dimensions, Pvt. Ltd.  
140, Rajmahal Vitas II Stage  
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FAX: 812 330 645
- S. Phillip Lewis  
Federation of Karnataka Chambers of Commerce & Industry  
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- S. K. Sharma, Senior Vice President  
Mico (Bosch Group)  
Motor Industries Co., Ltd.  
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FAX: (080) 212 728
- C. P. Rangachar, Managing Director  
Yuken India, Ltd.  
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FAX: (91) 812 213 721
- Dr. Ramadas P. Shenoy  
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Between 9th & 11th Cross  
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## I. SUMMARY of MEETINGS / SITE VISITS / INTERVIEWS

- continued -

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**Col. C. K. Seshadri, CTD**

**K. S. N. Murthy, CTD**

**G. V. Viswanath, CTD**

**A. S. Lakshmanan, CTD**

**K. K. Taneja, DDG (Retd), DGTD**

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**T. Ramappa**

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**5/14/93 BEML Kolar**

**H. N. Subba Rao, Chief General Manager**

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**I. SUMMARY of MEETINGS / SITE VISITS / INTERVIEWS**  
- continued -

**5/15/93 Trainers Meeting**

**T. Ramappa, Secretary II**

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## I. SUMMARY of MEETINGS / SITE VISITS / INTERVIEWS

- continued -

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### R. Natarajan, Chief Manager, Training & Development

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### 5/13/93 Central Machine Tool Institute

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### A. Mukherjee, Executive Director

Indian Machine Tool Manufacturers' Association

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### 5/14/93 Tata Elxsi

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### 5/15/93 Wipro

Ashok Soota, President

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## I. SUMMARY of MEETINGS / SITE VISITS / INTERVIEWS

- continued -

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**5/17/93 Electronics City**

**R. Ganguly, General Manager**  
NTTF Electronics Training Centre  
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**5/17/93 AWAKE**

**Madhura M. Chatraphathy, President**  
Association of Women Entrepreneurs of Karnataka (AWAKE)  
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**5/17/93 WIDIA / FMS**

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**5/18/93 State of Karnataka**

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Commerce & Industries Department  
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FAX: 0812 269 870

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## **I. SUMMARY of MEETINGS / SITE VISITS / INTERVIEWS**

- continued -

### **Other**

**Dr. Manmohan Attavar, President**

**Indo-American Hybrid Seeds**

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**Vinay L. Deshpande, Vice Chairman**

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**Leo Complex, 4th Floor**

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**Phone: (91) 812 580 405**

**FAX: (91) 812 565 487**

**(former member of Infomatics Focus Group)**

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**J. INDUSTRIAL LIAISON  
Summary**

Firm  
HMT

CTD Statement of Involvement  
considering FMS proposal.

ITI

no active proposals, but is reported to be known to Informatics Focus Group members

Bharat Earthmovers Ltd (BEML)

Dr. Aprameyan is reported to be an active member of Informatics Focus Group

Bharat Electronics (BE)

Dr. Ramanna is reported to be an active member of HRD Support Group and is reported to be planning 50:50 training on surface mount technology.

NTTF Electronics Centre

unknown extent of involvement

MICO

Mr. Sharma is reported to be an active member, proposed Metrology project under Buyer/Supplier Initiative

WIPRO

Mr. Soota is reported to be an active member of Informatics Focus Group.

ABB Ltd

Mr. Shenoy is member of CTD Governing Board and reported to be an active supporter of Centre for Manufacturing Engineering... stationed in Dehli.

WIDIA

Mr. Srinivasan is reported to be an active member of Centre for Manufacturing Engineering, proposal for 1/6 funding for FMS development.

Karnataka State Electronics  
Development Corp.

unknown extent of involvement

Source: P.C.Nayak, personal communication, undated, 11 May 1993.

## **K. INFORMATICS FOCUS GROUP SUMMARY**

**Baseline Survey: Software, 1990**

**Activities Supported:**

- 1) UNIX / C Computer Training program at IISc / CCE
- 2) Low-cost Chemistry Equipment Training program
- 3) PC Training at KREC Suratkai by D.K.Distributors
- 4) CNC Operation Training Programs at GTTC
- 5) PC equipment for MEI Polytechnic - Training Program
- 6) PC equipment for NEC - Training Program
- 7) Strategies for Commercialization in Renewable Energy, cosponsored with KSCST
- 8) PC Training at I of E by D.K.Distributors
- 9) Rapid Product Development Facility at NEC
- 10) Computer Exhibition / Demonstration at CCCE, Mangalore
- 11) CNC Maintenance program at NEC
- 12) PC equipment for St.Agnes College, Mangalore
- 13) CNC Maintenance program at NTTF - NOTE: see also #11 (above)
- 14) CAD Center equipment at IISc
- 15) Workstation at IISc Mechanical Engineering Department
- 16) PC equipment for FKCCI, Bangalore
- 17) Seminar at Poona
- 18) EMI and EMC Training at NEC
- 19) Management Studies on Energy and Technology Management cosponsored with IISc
- 20) Women in Development - Electronics, GTTC
- 21) PC equipment for Canara Community College
- 22) Applied Technology Center for CME
- 23) PC Training at CCC by D.K.Distributors
- 24) University-Industry Interface for KREC by CSIC
- 25) Baseline Survey by NASSCOM
- 26) FMS and Robotics by CMTI, CAIR, BEML, and Be
- 27) ASIC Design by KREC
- 28) International Seminar by IDRC-CTD
- 29) Tooling Industry Workshop by CMTI
- 30) PC equipment for Computer Society of India
- 31) Baseline Survey by NASSCOM - NOTE: see also #25 (above)
- 32) University-Industry Synapse Workshop
- 33) MSc Computer Software Course, Mangalore University

## K. INFORMATICS FOCUS GROUP

- continued -

- 34) Metrology Baseline Survey
- 35) CTD Informatics activity evaluation, B.N.Bhagwat
- 36) Computer equipment to computer training centers
- 37) Negotiation and Settlement Advocacy Seminar, cosponsored with National Law School of India University, Bangalore
- 38) ADP-IRM
- 39) M.E. software for IISc
- 40) CEDT software for IISc
- 41) CSA software for IISc
- 42) Software for BEML
- 43) Software for CMTI
- 44) Software for WIDIA
- 45) Software for Tata Elxsi (I) Ltd.
- 46) DTP, CNC, AutoCAD facility for GTTC
- 47) Low Cost Chemistry Equipment Seminar
- 48) VMC Center for GTTC
- 49) ETC at Karnataka Polytechnic Mangalore for Women
- 50) CNC Retrofit equipment for KREC Suratkal
- 51) AutoCAD Centre for KREC
- 52) CNC Machining Centre for CMTI Bangalore
- 53) CNC retrofit & T-70 Lathe training Centre at CTTC Mangalore
- 54) CNC Machining Centre at CMTI Bangalore - NOTE: see also #52 (above)
- 55) CTD Digital Computer Training Center at CCC Mangalore
- 56) Workstation at NAL Bangalore
- 57) Dr. R. Srinivasan in IEEE Computer Services Symposium USA
- 58) CTD delegates in 10th Indian Engineering Trade Fair, New Dehli
- 59) UNIX software for St.Aloysius College Mangalore
- 60) Graphics Training Centre for NAL Bangalore
- 61) CNC-VTC-800 Centre for GTTC
- 62) AutoCAD Centre for CCC
- 63) DTP Training Centre for St.Agnes College and St.Aloysius College Mangalore
- 64) CAD/CAM Centre for Viman Vikas Bhavan
- 65) Software and Hardware for NAL
- 66) CNC Training Centre for ESTC Ramanagar
- 67) Electronics Laboratory upgrade for KREC
- 68) Technical Library computerization software for Mangalore University.

## **L. FOOD PROCESSING FOCUS GROUP SUMMARY**

### **Baseline Survey:**

Mango, Guava, and Tomato in Karnataka, Jan 1991.

Kumaon Region, Jul 1992.

Wheat and Wheat-based products, undated.

### **Activities Supported:**

- 1) Bakery Training Program, CFTRI Mysore, cosponsor with SKIIDC, 26 Feb - 9 Mar 1990., 25,000 Rs reported 31 Mar 1990.
- 2) Food Processing Training Program, 26 Mar - 4 Apr 1990, 25,000 Rs reported 30 Jun 1990.
- 3) ATC for Coffee Industry workshop, 25,000 Rs approved 5/25/90.
- 4) Fruit & Vegetable Processing Workshop cum Training Program, 25,000 Rs reported 31 Dec 1990.
- 5) Fruit & Vegetable Processing Training Program cum Seminar with KSFC, DFRL, and CFTRI, unknown amount, reported 30 Sep 1990.
- 6) Facilitation Centre for Processed Foods, AWAKE proposal, 350,000 Rs reported 30 Sep 1990.
- 7) ATC - Fruit & Vegetable Processing seminar, Feb 1991, 25,000 Rs, 30 Sep 1990.
- 8) Standard Technology for Bacterial & Chemical Analysis Training Program cum Seminar by Fruit & Vegetable Processing Panel, 24,000 Rs, reported 31 Mar 1991.
- 9) Microlevel National Survey for Wheat and Wheat-based Products, 100,000 Rs reported 31 Mar 1991.
- 10) Analytical Quality Control Laboratory establishment at GKVK of UAS - Bangalore, 1,500,000 Rs reported 30 Jun 1991.
- 11) Seminar cum Training Program (n.o.i.) at NDRI & UAS - Bangalore in association with AFST, 24,000 Rs reported 30 Jun 1991.
- 12) International Bakery Training Method & Scope Study by KSIIDC, 100,000 Rs reported 30 Jun 1991.
- 13) Training Program (n.o.i.) at NDRI.
- 14) Kumaon Regional Development seminar, 19 Sep 1991 at Pantnagar UP, 100,000 reported 30 Sep 1991.
- 15) Kumaon Regional Development especially Food & Vegetable, 150,000 Rs reported 30 Sep 1991.
- 16) Tomato Processing Workshop at IIPA, 10,000 Rs 22 Feb 1992.
- 17) Fruit & Vegetable Processing Workshop, 500,000 Rs 21 Feb 1992.
- 18) Analytical Standard Techniques in Food Industries Workshop, 9 Apr 1992, 25,000 Rs reported 30 Jun 1992.

## L. FOOD PROCESSING FOCUS GROUP

- continued -

- 19) Centre for Processed Foods report preparation for IIHR Hesaraghatta, 100,000 and 150,000 Rs reported 30 Jun 1992.
- 20) Fruit & Vegetable Industry precooling equipment, 150,000 Rs reported 30 Jun 1992.
- 21) Food Processing Expert Systems Workshop 14 Sep 1992, 25,000 Rs reported 30 Sep 1992.
- 22) CTD - CAFT Memorandum of Understanding for working arrangements, unspecified, reported 30 Sep 1992.
- 23) CTD organizational study mission to Bhopal M.P., unspecified funding, not included in monthly / quarterly reporting.
- 24) CTD - CAFT Memorandum of Understanding for assistance in setting up an Advanced Technology Centre - Centre for Processed Foods , \$40,000 USD, 12 Dec 1992.
- 25) HOPCOMS Cold Chain in Bangalore, 500,000 Rs reported 31 Mar 1993.
- 26) Fruit & Vegetable Processing Industry in the Kumaon Region seminar in New Dehli, Reported 50,000 Rs 28 Nov 1992 and 100,000 Rs 31 Mar 1993.
- 27) Fruit & Vegetable Packaging facility in Bangalore, reported 7,500,000 Rs 31 Mar 1993.
- 28) CFTRI Mysore study tour 10 Mar 1993, reported 5,000 Rs 31 Mar 1993.
- 29) Analytical Quality Control Laboratory instruments training program for staff of the Horticulture Division of UAS 25 Jul 1992, 30,000 Rs.
- 30) Kumaon Region development seminar in Dehli 31 Jul 1992, 200,000 Rs.
- 31) CTD at Madhya Pradish, 31,862 Rs reported 30 Sep 1992.

### Notes:

True Potato Seed activities listed under DryLand Agriculture Focus Group  
Some general CTD activities listed above

**M. NEW MATERIALS FOCUS GROUP  
SUMMARY**

Baseline Survey, to be arranged

**Activities Supported:**

- 1) Seminar (cum Workshop) - Calibration & Facilities in Ceramic Technology Institute
- 2) Composite Testing equipment for NAL
- 3) Ceramic Technology Institute equipment
- 4) Pressure DSC apparatus proposal
- 5) Composite testing facility at NAL
- 6) Fibre-reinforced Plastic Moulding Training at SISI

**N. DRYLAND FARMING FOCUS GROUP  
SUMMARY**

Baseline Survey, to be arranged

**Activities Supported:**

- 1) Potato Seminar, 5-6 Sep 1991, 100,000 Rs reported 30 Sep 1991.
- 2) True Potato Seed Training Program at Modipuram, unknown funding reported 30 Dec 1991.
- 3) True Potato Seed Training Program at CFTRI Mysore, unknown funding reported 30 Dec 1991.
- 4) True Potato Seed Training Program at Modipuram Jan 1993, 50,000 Rs reported 30 Sep 1992.
- 5) Dryland Development documentary film, 200,000 Rs reported 31 Mar 1993.
- 6) True Potato Seed Symposium cosponsored with Horticulture Society of India, 300,000 Rs reported 31 Mar 1993.
- 7) True Potato Seed tour to Hassan, 10,000 Rs reported 31 Mar 1993.
- 8) Potato low cost storage facility at Karnataka, 500,000 Rs reported 31 Mar 1993.

## O. FORMAT FOR TRAINING PERSONNEL

1. Object of the Training programme :
2. Sponsor :
3. Target Persons :
4. Duration of the Course :
5. No. of Trainees :
6. Selection Procedures :
7. Place :
8. Faculty - Names, qualification & experience :
9. Proposed Curriculum in brief :
10. Fees proposed to be charged per trainee :
11. Accommodation facility, if any :
12. Literature proposed to be supplied :
13. Projected expenditure :
14. C.T.D. Assistance requested :

## **P. FORMAT FOR REPORT AFTER COMPLETION OF TRAINING COURSE**

1. Name of Faculty members :  
Qualification & no. of Hours  
of participation :
2. Names of trainees, their  
qualifications, experience and  
present employment :
3. Dates on which course was  
conducted :
4. No of hours of Hands on or lab-  
oratory work during the course :
5. Summary of attendance record of  
the trainees during the course. :
6. Marks sheet if any tests were  
conducted during or at the  
end of the course :
7. Views and suggestions of faculty  
members on the course :
8. Views and suggestions of trainees  
on the course :
9. Details of any literature distri-  
buted to students :
10. Cost of consumables used during  
the course :

## **Q. THE NATIONAL VENTURE CAPITAL FORUM (undated)**

The National Venture Capital Forum (NVCF) is a division promoted by the Centre for Technology Development (CTD) as an integral part of its secretariat. It is a national clinic for providing assistance to emerging growth companies. It offers businesses at a critical stage of development an opportunity to obtain counsel from a CTD panel of honorary experts on possible steps for achieving their goals.

NVCF's main activity consists of periodical sessions in which the business plans of companies accepted for presentation are evaluated during a "no-holds-barred" session lasting between sixty to ninety minutes. The session allows the presenter(s) twenty minutes to summarize their business plan orally. The written business plans submitted by the presenting party are reviewed by the panelists in advance of the session. Then each of the panelists such as venture capitalists, bankers, marketing specialists, successful entrepreneurs, professors and other experts will give his assessments of the strengths and weaknesses of the plan and the enterprise and suggestions for improvement.

In some cases, the panelists may suggest a completely new direction. In others, they may advise on more effectively carrying out existing policies. Their comments could range over the entire spectrum of business issues.

The sessions are also open to a group of persons specially invited by the CTD, e.g. financiers, business executives, accountants, lawyers, consultants and others with special interests in emerging companies. Following the panelists' evaluations, the audience members can ask questions and offer comments.

Presenters have the opportunity to respond to the evaluations and suggestions offered. They can also receive written evaluations of the oral presentation from the audience members. However, the written plan is not made available to the audience. These sessions will be held primarily for companies that have advanced beyond the start-up stage - particularly those already sanctioned venture capital assistance by IDBI, TDICI, RCTC, CVCF, etc. and are in need of specialized advice.

In addition to the above sessions, NVCF will also sponsor a Startup Clinic at which entrepreneurs seeking advice and funds for new enterprises make presentations. The Startup Clinic is a more loosely structured outfit and is open only to selected entrepreneurs, small business professionals, consultants, investors, and others who might be of direct assistance to the startup enterprise.

The NVCF is overseen by an Executive Committee, headed by Mr. N. D. Prabhu who recently retired after a glorious career as the Chairman and Managing Director of the Canara Bank. NVCF is served by a small Venture Capital Division of CTD headed by Mr. P. R. Rao who is a retired head of a high technology public sector enterprise and is an expert on venture capital movement in India. Other members of the Executive Committee are business executives who donate their time and services to the Forum (as do the panelists). These executives include entrepreneurs, financiers, bankers, consultants and professors.

The NVCF also intends to publish a newsletter, The NVCF Reporter and hold an annual day-long national seminar on critical aspects of the development of venture capital movement in India.

## R. US AID CTD PROJECT MANAGEMENT

The review of this paper pointed out that specific requirements for the success of the CTD will fall on US AID project management, perhaps mandating behaviors and operations beyond normal ranges of activities. The following represents an attempt to codify some of these considerations. Except with the additions as noted below, a standard position description is appropriate.

### Major Duties and Responsibilities:

- c) **Project management and implementation:**
  - Support the development of management processes through direct counsel and professional recommendations.
  - Develop confidence of CTD management and Board of Governors from ability to provide constructive support in the development of the program.
  - Working with executive and operating management of CTD, ensure the development of testable hypotheses in regard to the experimental resource mobilization process.
  - Working with executive and operating management of CTD, ensure the development and implementation of measures of performance for CTD and its subsidiary / associated activities. Ensure written documentation of both USAID and CTD processes and outcomes is complete and fully accurate without being bureaucratic, contributing to the design of simplified, pithy reporting as required.
- d) **Project development:**
  - Provide conceptual and operational counsel to ensure that the course of the project stays within the parameters of project design.
  - Provide counsel on the strategic balance of CTD activities, ensuring that the balance is maintained between fidelity to the project design and the evolving economic development needs that spawned the project.
- e) **Project monitoring evaluation:**
  - Actively contribute to the development, implementation, and review of direct and indirect measures of the performance of the CTD resource mobilization process.
  - Ensure that quarterly performance reports fully and accurately reflect the activities of the CTD resource mobilization process.
  - Ensure that monitoring information is necessary and sufficient to evaluate the key aspects of the CTD resource mobilization process experiment.

### Desired Qualifications:

- f) **Abilities and skills:** Demonstrated strong conceptual and administrative skills; results-driven while diplomatic; ability to deal equally well with academics, entrepreneurs, business and government executives, and retired persons of significant energy and stature; ability to disagree without being disagreeable; independent and resourceful; excellent communications and interpersonal skills; familiarity with technology development and management.

**S. CTD A PUBLIC AFFAIRS STRATEGY, 1993 - 1996**  
**DRAFT INTERNAL PAPER - May 1993**

## **DISCUSSION ITEMS**

- 1. ASSUMPTIONS**
- 2. SOME RULES OF THUMB**
- 3. CTD PUBLIC AFFAIRS GOALS**
- 4. KEY - CTD PA CONSTITUENCIES**
- 5. THREE CTD PA APPROACH - CHANNELS**
- 6. EXPECTED OUTCOMES**
- 7. PUBLICATIONS AND FILMS STRATEGY**
- 8. FOCUS GROUP/SUPPORT GROUP STRATEGY**
- 9. DECISION - MAKERS STRATEGY**
- 10. CONCLUDING REMARKS**

# 1. ASSUMPTIONS

1. CTD CORPORATE VIEW HELD BY USAID IS THAT CTD SHOULD HAVE A HIGHER PROFILE AND BE BETTER KNOWN IN THE RIGHT PLACES THAN IS CURRENTLY THE CASE
2. INDIA IS NOW IN A PROCESS OF ECONOMIC LIBERALISATION;
3. GOVT OF INDIA IS PRESENTLY FORMULATING A LONG TERM TECHNOLOGY POLICY AND CTD CAN ENHANCE ITS PROFILE BY PROVIDING A USEFUL INPUT TO APPROPRIATE CONSTITUENCIES THAT SHAPE SUCH A POLICY
4. TO THESE ENDS A CTD PUBLIC AFFAIRS APPROACH IS NEEDED THAT IS EFFECTIVE, COMPREHENSIVE AND RESPONSIVE TO THE OBJECTIVES OF THE CTD PROJECT

## **2. SOME RULES OF THUMB**

- 1. THE INTERESTS OF A CTD PUBLIC AFFAIRS PROGRAMME ARE RELATED TO GROUND REALITIES AND NEEDS OF CTD AS AN INTEGRAL PROJECT RATHER THAN THOSE SPECIFIC TO ANY SINGLE PROJECT OF CTD LIKE CME, CPF, BSDI, NVCF etc.**
- 2. CTD PUBLIC AFFAIRS SUCCESS IS DIRECTLY TIED TO SUCCESS OF CTD PROJECTS IN THE FIELD**
- 3. IT IS MORE LIKELY THAT A CTD PUBLIC AFFAIRS STRATEGY WILL SUCCEED AT CRYSTALLISING AND SUPPORTING EXISTING TENDENCIES IN KEY PUBLICS, THAN IT WILL IN CHANGING THEM OR CREATING NEW ONES**
- 4. PERSISTENT EFFORT AND A CRITICAL - MASS APPROACH ALONE CAN YIELD RESULTS IN A PUBLIC AFFAIRS PROGRAMME**
- 5. FOR AN ORGANISATION LIKE CTD A SOFT - SELL APPROACH RATHER THAN A HARD - SELL APPROACH WILL BE SUCCESSFUL**

### **3. CTD PUBLIC AFFAIRS GOALS**

- 1. THROUGH AN EFFECTIVE APPROACH TO INFORM KEY AUDIENCES ON THE ROLE OF TECHNOLOGY IN DEVELOPMENT AND CTD's SUPPORTIVE ROLE FOR TECHNOLOGY DEVELOPMENT**
- 2. THEREBY BE BETTER KNOWN AND APPRECIATED BY AT LEAST KEY AUDIENCES - NOT BY ADVERTISEMENTS BUT BY PROVIDING TIMELY/APPROPRIATE AND COMPREHENSIVE INPUTS**
- 3. THROUGH INDIRECT AND DIRECT APPROACHES TO ENCOURAGE KEY DECISION MAKERS IN GOVERNMENT, INDUSTRY, RESEARCH INSTITUTIONS AND UNIVERSITIES TO CONTINUE TO RESPOND TO CTD INITIATIVES AT APPROPRIATE LEVELS IN KEY PUBLICS**

## **4. KEY CTD - PA CONSTITUENCIES**

- 1. GOVERNMENT**
- 2. INDUSTRY**
- 3. RESEARCH INSTITUTIONS**
- 4. UNIVERSITIES AND OTHER EDUCATIONAL GROUPS**
- 5. FUNDING AGENCIES BOTH NATIONAL AND INTERNATIONAL INCLUDING NGO's**

## **5. THREE CTD PA APPROACH - CHANNELS**

- 1. GENERAL APPROACH - CHANNEL THROUGH PUBLICATIONS & FILMS**
- 2. INTERMEDIARIES GROUP APPROACH - CHANNEL AT FOCUS GROUPS/SUPPORT GROUPS CTD MEETINGS**
- 3. DIRECT INTERPERSONAL APPROACH - CHANNEL WITH DECISION - MAKERS AT APPROPRIATE LEVELS THROUGH PRESENTATIONS**

## 6. EXPECTED OUTCOMES

### 1. GENERAL APPROACH - CHANNEL INFLUENCES PERCEPTIONS BY

- \* BETTER PUBLIC UNDERSTANDING OF TECHNOLOGY
- \* REINFORCEMENT OF THE NAME AND PRESTIGE OF CTD AS A PREMIUM INSTITUTION CONTRIBUTING TO TECHNOLOGY DEVELOPMENT AMONG KEY PUBLICS

### 2. INTERMEDIARY GROUP APPROACH - CHANNEL INFLUENCES INTENTIONS BY

- \* INCREASED AWARENESS OF THE VALUE OF TECHNOLOGY DEVELOPMENT
- \* BETTER APPRECIATION OF CTD's SPECIAL APPROACH TO TECHNOLOGY DEVELOPMENT
- \* POSITIVE SUPPORT TO CTD WHEN CALLED ON

### 3. DIRECT INTERPERSONAL APPROACH - CHANNEL INFLUENCES BEHAVIOUR BY

- \* INCREASED AWARENESS AND APPRECIATION OF CTD IN A FIELD OF OPTIONS
- \* DIFFUSING MISCONCEPTIONS
- \* OPINION BUILDING FOR POSITIVE SUPPORT TO CTD INITIATIVES

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## **7. PUBLICATIONS AND FILMS STRATEGY**

**THIS MASS - MEDIA COMMUNICATION STRATEGY OF CTD CONSISTS OF THE FOLLOWING ELEMENTS**

**FOR GOVT, INDUSTRY  
AND FUNDING AGENCIES  
AND NGO'S**

**: ANNUAL REPORTS  
'OPINION' DOCUMENTS**

**FOR EDUCATIONAL  
AND RESEARCH INSTITUTIONS**

**: INSERTS FOR BULLETINS AND  
PROJECT REPORT  
TECHNICAL STUDIES**

**FOR GENERAL PUBLIC**

**: FILMS, NEWSLETTERS, BROCHURES**

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## **8. FOCUS GROUP/SUPPORT GROUP STRATEGY**

**THIS GROUP EDUCATION COMMUNICATION STRATEGY OF CTD CONSISTS OF THE FOLLOWING ELEMENTS -**

- \* STATE OF THE ART EXPERTS' LECTURES**
- \* SEMINARS**
- \* WORKSHOPS**
- \* CONFERENCES**

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## **9. DECISION - MAKERS STRATEGY**

**THIS ONE-UPON-ONE COMMUNICATION STRATEGY OF CTD CONSISTS OF THE FOLLOWING ELEMENTS.**

- \* TOURS TO CTD PROJECTS**
- \* INDIVIDUAL PRESENTATIONS TO TOP - LEVEL POLICY - MAKERS**
- \* LIAISON WITH CHAMBERS OF COMMERCE AND INDUSTRY ASSOCIATIONS**
- \* SPECIALISED INFORMATION KITS**
- \* EXCLUSIVE SEMINARS**
- \* INTERACTIVE WORKSHOPS**

## **10. CONCLUDING REMARKS**

- \* EXTERNAL AUDIENCES WHICH AFFECT CTD CAN BE IDENTIFIED AND CATEGORISED BY WAY OF ISSUE, INTEREST, TACTICS AND LEVEL OF POTENTIAL IMPACT**
- \* OPINION MAKERS TEND TO FIND THEIR PLACE CLOSE TO SENIOR MANAGEMENT AND LEADERSHIP**
- \* MULTI CHANNEL APPROACH STRATEGIES ARE MORE SUCCESSFUL THAN A SINGLE CHANNEL APPROACH**
- \* SUCCESS OF CTD PUBLIC AFFAIRS PROGRAMME LIES IN THE SYNERGY OF SUCH STRATEGIES**
- \* NOTHING SUCCEEDS LIKE SUCCESS**

**T. ANALYTICAL QUALITY CONTROL LABORATORY**  
**SCHEDULE OF PRICES**  
 15 May 1992

1.	Moisture	20	25	Vitamin 'B' 12	60
2.	Total ash	25	26	Linoleic acid	40
3.	Crude fat	30	27	Super amino acid	60
4.	Crude protein	40	28	Choline chloride	40
5.	Nitrogen solubility index	75	29	Nicotinic acid	40
6.	Urease activity	70	30	Alpha tocopherol	60
7.	Urea	40	31	Complete acids	--
8	Salt as NaCl	35	32	Aflatoxin	125
9	Calcium as Ca	40	33	Proximate analysis	100
10	Phosphorus (available)	40			
11	Lysine	50		FOOD	
12	Methionine	50	34	Gluten	40
13	Vitamin 'A'	80	35	Colour grade	40
14	Metabolisable energy	100	36	Alcoholic acidity	40
15	Manganese	50	37	Sed value	40
16	Iodine	40	38	Granularity	40
17	Iron	40	39	Fat acidity	40
18	Copper	40			
19	Zinc	40		MICROBIOLOGICAL	
20	Vitamin 'D'	75	40	Total plate count	100
21	Thiamine	50	41	E. Coli	100
22	Riboflavin	50	42	Fungal salmonella	100
23	Pantothenic acid	40	43	% Fat	50
24	Biotin	50			

## U. NATIONAL EXPENDITURE OF R&D BY SECTOR

Crores of 1980-81 Rupees

<u>Year</u>	<u>Central Government</u>	<u>State Government</u>	<u>Public Sector Industry</u>	<u>Private Sector Industry</u>	<u>Total</u>
1976-77	373.37	35.01	44.12	67.26	519.76
1978-79	458.62	51.65	70.84	97.39	678.50
1980-81	494.12	59.34	86.37	120.69	760.52
1982-83	662.92	81.49	102.82	165.39	1,012.62
1984-85	901.60	90.89	123.40	168.06	1,283.95
1985-86	974.89	109.01	133.01	168.72	1,385.43
1986-87	1,091.01	102.97	147.49	182.49	1,523.96
1987-88	1,190.53	105.76	165.88	178.41	1,640.58
1988-89	1,240.20	135.02	181.83	221.96	1,779.01
1989-90	1,248.94	149.23	204.55	243.04	1,845.76
1990-91	1,283.03	147.74	197.55	234.10	1,862.42

Source: Science & Technology Pocket Data Book, Government of India, Department of Science & Technology, New Dehli, 1992, p.10.

**V. INDUSTRIAL R&D EXPENDITURE BY LEADING INDUSTRY GROUPS  
% OF SALES TURNOVER**

<b>Industry Group / Year</b>	<b><u>1980-81</u></b>	<b><u>1985-86</u></b>	<b><u>1988-89</u></b>	<b><u>1989-90</u></b>	<b><u>1990-91</u></b>
<b>Electrical &amp; Electronics</b>	1.42	1.31	1.22	1.10	1.05
<b>Defence Industries</b>	4.80	3.50	4.70	4.85	4.08
<b>Metallurgical Industries</b>	0.35	0.29	0.38	0.37	0.42
<b>Drugs &amp; Pharmaceuticals</b>	2.09	1.91	1.51	1.45	1.50
<b>Transportation</b>	1.14	0.53	0.56	0.57	0.62
<b>Fuels</b>	0.13	0.10	0.13	0.14	0.20
<b>Chemicals (excl. fertilizers)</b>	0.70	0.94	0.81	0.88	0.67

Source: Science & Technology Pocket Data Book, Government of India, Department of Science & Technology, New Dehli, 1992, p.26.

## W. R&D INSTITUTIONS BY STATE & SECTOR

<u>State</u>	<u>Central</u>	<u>State</u>	<u>Uni- versity</u>	<u>Public Industry</u>	<u>Private Industry</u>	<u>Total</u>
Andaman & Nicobar	2	0	0	0	0	2
Andhra Pradesh	26	51	17	14	50	158
Arunachal Pradesh	1	1	1	0	0	3
Assam	8	26	3	1	4	42
Bihar	11	30	13	10	5	69
Chandigarh	5	0	2	1	13	21
Delhi	60	0	11	27	101	199
Goa	1	2	1	1	2	7
Gujarat	13	48	10	3	74	148
Haryana	8	24	4	6	17	59
Himachal Pradesh	6	36	3	0	1	46
Jammu & Kashmir	2	17	3	0	0	22
Karnataka	42	23	10	8	84	167
Kerala	15	58	6	4	24	107
Madhya Pradesh	11	36	14	3	20	84
Maharashtra	45	98	20	16	399	578
Manipur	0	0	1	0	0	1
Meghalaya	3	5	1	1	0	10
Nagaland	0	0	0	0	0	0
Orissa	12	31	5	1	8	57
Pondicherry	2	0	1	0	6	9
Punjab	3	11	4	0	9	27
Rajasthan	9	22	10	3	10	54
Tamil Nadu	23	81	17	8	122	251
Tripura	0	5	1	0	0	6
Uttar Pradesh	42	71	27	11	36	167
West Bengal	34	37	11	20	103	205
<b>TOTAL</b>	<b>384</b>	<b>713</b>	<b>196</b>	<b>138</b>	<b>1 088</b>	<b>2 519</b>

Source: Science & Technology Pocket Data Book, Government of India, Department of Science & Technology, New Dehli, 1992, p.114-115.

## X. PROTOTYPE PROJECT CHECKLIST

Project Name: \_\_\_\_\_ ID: \_\_\_\_\_

- |  |   |
|--|---|
| <p>1) <b>Overall economic rationale</b> - the fit between the actions and results with the broad trends in the regional economy, including the participation in strategic objectives for developing specific sectors of the economy;</p>   | <p>Date: _____<br/>                 Initial: _____<br/>                 Baseline Survey<br/>                 Dated: _____</p> |
| <p>2) <b>Market demand</b> - demonstrated fundamental needs for the proposed activity based on a mismatch between demand and supply and the emergence of new technological needs;</p>  | <p>Date: _____<br/>                 Initial: _____</p>  |
| <p>3) <b>Structure and Organization</b> - including i) basic assumptions, ii) administrative and iii) program structures including key players, primary objectives, work plans, staffing, management support, and facilities, iv) customers and their characteristics, v) sponsors / investors, vi) budgets including capital costs, operating expenses and vii) sources of revenue;</p> | <p>Date: _____<br/>                 Initial: _____<br/>                 Business Plan<br/>                 Dated _____</p>    |
| <p>4) <b>Business participation</b> - extent &amp; quality of business participation in proposal development, activities, finance;</p>   | <p>Date: _____<br/>                 Initial: _____</p>  |
| <p>5) <b>Institutional autonomy</b> - proposed institutions, except training programs and equipment proposals, are expected to be independent entities with own mgt. &amp; board of directors;</p>   | <p>Date: _____<br/>                 Initial: _____</p>  |
| <p>6) <b>Use and adaptation of existing technology</b> - degree to which the proposal focuses on making the most use of existing technologies with adaptations to Indian markets;</p>  | <p>Date: _____<br/>                 Initial: _____</p>  |
| <p>7) <b>Utilization of "Best Practices"</b> - familiarity with the "state-of-the-art" and "best practices" including how their use will be developed by the proposal</p>  | <p>Date: _____<br/>                 Initial: _____</p>  |
| <p>8) <b>Intellectual property rights</b> - protection of U.S. intellectual property interests has been considered and is assured;</p>   | <p>Date: _____<br/>                 Initial: _____</p>  |
| <p>9) <b>Environment / Health</b> - potential impacts on both the environment &amp; the health of consumers is considered.</p>   | <p>Date: _____<br/>                 Initial: _____</p>  |

Support:	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Client _____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Other _____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
USAID _____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

**Key Results:**

_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

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## Y. LIST of ACRONYMS

ATC	Applied Technology Centre
BSDI	Buyer / Supplier Development Initiative
CAD	Computer Aided Design
CAE	Computer Aided Engineering
CAM	Computer Aided Manufacturing
CET	Centre for Elite Trees
CFTRI	Central Food Technological & Research Institute
CME	Centre for Manufacturing Engineering
CMTI	Central Machine Tool Institute
CNC	Computer Numerically Controlled
CPF	Centre for Processed Foods
CPRI	Central Power Research Institute
CTD	Centre for Technology Development
FMS	Flexible Manufacturing System
FTI	Foremen Training Institute
GTTC	Government Toolroom & Training Centre
HRD	Human Resource Development
ICICI	Industrial Credit & Investment Corporation of India
MSS	Mission & Scope Study
NEC	NTTF Electronic Centre
NTTF	Nettur Technical Training Foundation
PACD	Project Assistance Completion Date
PID	Project Identification Document
PP	Project Paper
ProAg	Project Agreement
SME	Small and Medium-sized Enterprises
TPS	True Potato Seed
TDD	Technical Disbursement Date
TDICI	Technological Development & Information Company of India Ltd.
UAS	University of Agricultural Sciences
USAID	United States Agency for International Development
VC	Venture Capital

**Z. PROJECT DATA SHEET**

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**CENTRE FOR TECHNOLOGY DEVELOPMENT PROJECT  
MID-TERM EVALUATION  
ISSUE PAPER**

**INTRODUCTION**

The purpose of the CTD project is to develop and improve infrastructure resources essential for India's economic growth, initially in the state of Karnataka with Bangalore as the main focus.

The goal is to accelerate the pace and quality of technology application to product and production process development in existing and new businesses in key sectors important to India's development such as industry, agriculture, energy, health, etc.

The basic details of the project are:

Project Agreement (Pro Ag):	07/29/89
Project Assistance Completion Date (PACD):	07/31/95
Technical Disbursement Date (TDD):	04/30/96

A mid-term evaluation at the end of the second phase, i.e. after 42 (18+24) months, was envisaged in the project paper. This was deferred and an interim in-house assessment was conducted jointly by the TDE and Controller's Offices in February, 1992. The interim assessment suggested that the mid-term evaluation consider reframing the project purpose and goal in order to express the importance of the CTD process and the role of focus and support groups as outcomes. It was also recommended that the evaluation judge the replicability of the process.

The mid-term evaluation was actually carried out between May 3 and 28, 1993.

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**ISSUE ONE:**

The team recommended that CTD and USAID should agree to a simplified and concise statement of the project:

**A mobilization of regional resources for technology development and use, in a limited number of focussed areas, for maximum impact.**

Background:

The team found that the level of understanding of the CTD concept and process is uneven. Several "participants" in CTD expressed a clear understanding of the process and its various activities, but this group is rather limited. The various CTD audiences are not adequately informed of CTD - both what it is and how it works. Multiple descriptions and continual discussion, with sparse documentation, lead to two extreme interpretations - a confused view and an oversimplified one.

The oversimplified view characterizes CTD as a one dimensional human resource development (technician training) program. The confused view has yet to determine a clear picture of CTD and questions its ultimate purpose and impact.

Discussion:

CTD works across a range of cultures: academic, government, business and finance. In working with such ranging groups, CTD must be able to simply, consistently and clearly present its message and its services.

Recommendations:

The team's rephrasing of the project statement appears to be

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unexceptionable and the mission should ensure its adoption.

## ISSUE TWO

A clear emphasis on the need for "market driven" philosophy is central to CTD activities; it is not clear whether that referred to in the PP is the market for technology by industry users, or the markets for products produced by Indian industry and the technological need of industry to compete in these markets. The distinction is subtle but important, especially with the enactment of liberalization policies by the GOI.

If the market for end products is intended as the driving force, then CTD would be expected to undertake a systematic effort to identify these market needs and opportunities and conduct an analysis of the technological requirements for Karnataka industry to compete in these markets. At present, the market analysis and intelligence dimension of CTD is weak, under the implicit assumption that the Focus Group membership will provide full and correct market information through the expertise and experience of the members. This is a weak assumption. Most members of Focus Groups come from academic and government careers. Those members from industry are retired and hence were in key positions in industry prior to liberalization when the Indian policy environment was still highly protected. With the opening to market forces, the character of market opportunities and competitive requirements is likely to change fundamentally. In some Focus Groups, specifically Informatics and New Materials, participation by active private sector representatives occurred in the projects' formative stage. However, this participation has not continued.

If the market for technology by Karnataka industry is the driving force, two problems emerge: first, Indian industry, or major portions of it, generally has not appreciated the value of technology to competitiveness, especially technology found in local institutions. Such circumstances raise the need to educate

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industry decision makers about the value of technology and technological skills for achieving their business goals. This entails undertaking a variety of activities to educate and raise awareness in industry through media, seminars and conference and focused industry-specific initiatives. Furthermore, the technological needs of industry may not be satisfied by the technological resources available in local institutions at present. Much of Indian R&D (with notable exceptions) was focused on import substitution, a priority in a protected environment but much less so in a free market system. In turn, this focus suggests that CTD would undertake efforts to reorient the research and development directions of many laboratories and research institutes, not an easy task.

Based on CTD's original concept and its current status, the first definition of market driven is more appropriate.

Recommendation:

It is extremely desirable that industrial representation is increased on all the focus groups. A majority for such representatives will be immediately possible (and existed in the 1987-89 period) in the informatics/mechatronics group. In the other groups, 3 or 4 such industrial representatives should be added while simultaneously "weeding out" inactive members of the groups.

A similar change in the composition of the governing board is equally essential.

**ISSUE THREE**

Recruitment of a full-time Associate Executive Director.

Background and Discussion:

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CTD is a very small organization attempting to work in numerous areas, across industrial, academic and government cultures. CTD works through many fronts at once. One component of CTD is the USAID project with attendant specific project reporting and recording requirements.

The direction and control of CTD is provided *pro bono* by a group of dedicated individuals. These individuals provide their time and expertise but the implementation and monitoring of CTD is an enormous task which their part-time efforts do not seem to be up to providing in full measure.

The evaluation and monitoring section of CTD, established in 1992, provides the beginnings of an organized documentation system. The group was able to provide documents as requested by the evaluation team. However, the level of that documentation is lacking in some particulars. This lack will become especially acute now, as results and follow-up need to be documented. In the use of the same group of people (Focus Group) to initiate, develop, evaluate, and oversee the implementation of projects, good business practice is ignored.

This has contributed to CTD operations, including planning, proposal development and evaluation, funding mechanisms, and monitoring differing, frequently substantially, from the structure envisaged in the project paper. It has been exacerbated by CTD's conscious cost minimization policy (partly a result of its limited "non-USAID" resources) particularly with regard to administrative expenses.

Recommendation:

That USAID "reprogramme" certain funds as an endowment, with interest earmarked for the costs of such an Associate Executive Director (and an administrative assistant). In addition, CTD

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should be encouraged to raise more money to meet its other administrative expenses.

CTD should also assist the ATCs (CFT and CME) in raising sponsorship money from industrial and other sources for their expenses.

#### ISSUE FOUR

#### Replication

##### Background and Discussion:

The evaluation report says that "The lack of contemporaneous documentation of the process limits the replicability of the CTD process in Bangalore. The informal approach to need assessment, project definition, proposal development, proposal review, and results monitoring that CTD follows, although advantageous to responsive operations, makes replication difficult and did not produce a quick ramp-up to compensate for the lack of due process. Replicability requires a solid and well-structured foundation as a point of reference. Until and unless policies and procedures are developed as recommended, the CTD program can be replicated only through established personal networks. Such replication is more of an extension of the current program than replication of a successful template. Therefore, the steps to replicate the current CTD activity in Kumaon et al, begs the question as to why replication is desirable at this point when efforts need to be focused on core activities in Karnataka".

##### Recommendation:

Contrary to the team's recommendation, activities in Kumaon should be continued, especially in the agricultural sector, particularly because of the synergies that they have in Karnataka. In addition, host country contributions (in cash and in kind) have already been received for these proposed activities.

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**ISSUE FIVE**

The evaluation team recommends that CTD should modify its organization structure to integrate support group activities into all the focus groups. The concept of support groups should be dropped, except as a vertige of ad hoc meetings, eg. venture capital that services all focus groups.

Recommendation:

This is acceptable except for the human resources support group that ought to enjoy an independent existence although some elements (members) could be coopted into the focus groups. The human resource support group is unique in having a majority of its members from industry and also in a majority of them being active members who build on each others strengths.

**ISSUE SIX**

The evaluation team recommends that project commitments and disbursements should be curtailed until USAID counsels CTD in steering the project more towards its original goals and in addressing some of its shortcomings immediately.

Recommendation:

This is acceptable, but commitments already made by CTD (eg. towards final payments for machinery already installed or shipped) should be honoured along with other payments on a case-by-case basis until the changes in CTD's functioning are effected or underway.

**ISSUE SEVEN**

PACD extension may be necessary. The evaluation has recommended a 3 to 5 year extension.

Recommendation:

A shorter extension (say 2 years) may be better, so as not to lose the momentum now built up. However, period of extension should be decided later at the time of the 1994 PIR. \_\_\_\_\_

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Other recommendations which may be accepted are:

1. CTD Board should determine the requirements of external funding agencies to consider restructuring the CTD mobilization process philosophy and / or operations in order to attract significant external funding and attain sustainability for the mobilization process.
2. CTD management should provide USAID with succinct strategic, tactical and budgetary plans as envisioned in the project papers.
3. USAID should support CTD in developing measures of performance for the mobilization process and subsidiary operations that will drive operations to achieve project goals.
4. CTD should enhance their public relations and publicize their project concept and objectives to the industry and general public. It is suggested that CTD utilize technical assistance to ensure that this is done in the most professional manner. This will enhance CTD's effectiveness at bringing industries, institutions, and external funding agencies together.
5. USAID should provide management counsel and support to enable the potential of the CTD mobilization process to be achieved. This counsel should include application of general program requirements to individual projects, strategic and tactical oversight on program development and resources deployment, development of specific measures of performance for projects, conceptual aid in developing monitoring mechanisms.
6. CTD should increase the technical resources available to them on a regular basis in order to strengthen the process of evaluation of proposals, subsequent monitoring of projects, and to keep track of interrelated activities. USAID should reprogram certain funds as required to ensure the one-time ability to put such systems in place.
7. CTD must develop and implement record keeping and reporting mechanisms to provide project level and aggregate reporting in a time and consistent manner. Data about the CTD project, focus groups, individual projects,

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budget, and actual spending should be available. For this purpose, CTD is advised to hire a full-time manager with considerable project management experience to implement.

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UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

MEMORANDUM

June 25, 1993

TO: Distribution

FROM: Manmohan Reddy, TDE *mrReddy*

SUBJECT: CTD (386-0507)  
Minutes of the MRC meeting held on June 9, 1993 to discuss the recommendations of the mid-term evaluation

REFERENCE: Issue paper dated June 8, 1993

PARTICIPANTS:

D, WGBollinger  
DD, SPMintz  
PDI, JTarter  
CO, NNWahi  
PRO, BRPatil  
PDI, KCKapoor  
PDI, SNanda  
TDE, JAGrayzel  
TDE, AJYates  
TDE, RKBerry  
TDE, MReddy

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Background:

A mid-term evaluation of the Centre for Technology Development (CTD) project was carried out between May 2 and 28, 1993 by a team from Eccles Associates Inc. The team consisted of Drs. Jack Bishop, R. Mahadevan, Y. S. Rajan and Atul Wad and Dr. Kerri-Ann Jones from AID/W. The team's final report was received by USAID, New Delhi on May 28, 1993.

The MRC meeting considered the most significant recommendations of the report and its discussions are summarized below:

1. Project Concept (Mid-term evaluation recommendation-Concept.1):

The evaluation recommended that CTD and USAID use a simplified and concise statement of the project: "A mobilization of regional resources for technology development and use, in a limited number of focussed areas, for maximum impact". The MRC deliberated at some length on this recommendation and finally decided that the suggested statement was only a

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rephrasing of the concept and, therefore, did not necessitate a change in the purpose or goal of the project. It was also decided that there is no need to change the log frame and that this rephrasing of the concept ought to be used for external (and internal) publicity to make for better understanding of the project.

Thus, no action was required to be taken by USAID other than informing CTD about the team's suggestion of a simplified project statement.

**2. Greater representation for industry on the governing board and on the focus groups (Mid-term evaluation recommendation-Concept.2):**

Increased industry (private and public) representation is necessary on all focus groups in order to make them more market driven. An industry majority might be immediately possible in the informatics/mechatronics group, but not in dryland farming because this industry is in its infancy as far as the "organized" sector is concerned. Simultaneously, a reduction in "CTD administration" membership of the focus groups should be brought about while phasing out inactive members of the groups.

A similar change in the composition of the governing board was considered equally essential. It was suggested that technically knowledgeable and articulate representatives of industry associations (such as ASSOCHAM) and of women entrepreneurs would make useful additions to the governing board.

It was suggested that USAID should consider attending CTD Governing Board meetings as an observer (Mid-term evaluation recommendation-Operational.6).

It was decided that USAID senior management (Steve Mintz and/or Walter Bollinger) should talk to P. C. Nayak and explore the possibility of implementing these recommendations.

**3. Recruitment of a full-time Associate Executive Director using project funds (Mid-term evaluation recommendation-Concept.3):**

This recommendation was discussed at length and accepted in principle. As the legislation allowing endowments became effective in FY 1992, CTD funds obligated to date cannot be used for the proposed endowment to meet the recurring cost of this position. It was, therefore, decided to obligate incremental funds in FY 94 from which the endowment could be

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made. Meanwhile, considering the need to have this position filled ASAP, it was suggested paying for the associated costs out of the funds currently available in the project until the endowment is established. It was also decided to sort out the related administrative actions that would be required to be taken in this regard, including clearance of the RLA on whether or not project authorization amendment would be required for meeting these costs and for creating an endowment, especially in view of the fact that the original PP does not allow USAID funding the recurring expenses of CTD.

The Project Officer is to obtain the RLA's clearance on whether or not a Project Authorization Amendment would be required for meeting these costs and for creating an endowment.

**4. Replication beyond Karnataka be delayed (Mid-term evaluation recommendation-Strategic.4):**

The MRC accepted this recommendation only in part and decided that "replication" outside Karnataka not be allowed, except for activities in Kumaon for which host country contributions in cash and kind have already been received. Other activities outside Karnataka are to be put on hold till the management concerns are addressed and implemented.

**5. Curtailement of project disbursements and PACD extension (Mid term evaluation recommendation-Operational.1):**

The MRC decided that existing project commitments and disbursements should not be curtailed, but new ones should not be made until the desired changes in CTD's functioning are effected or underway. However, new proposals that meet the prescribed criteria may be approved and funds committed on a case-by-case basis.

PACD extension may be necessary, but this will be decided at the time of the PIR in March/April, 1994.

**6. Integration of support groups into focus groups (Mid term evaluation recommendation-Operational.4):**

This recommendation was accepted and it was decided to integrate all the support groups into the focus groups. This includes the human resources group although it has a vibrant existence unlike the others. Integrating the human resources group as well will allow USAID to "sell" the integration concept more effectively to CTD.

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PIC Review

The MRC decided that the details of the actual implementation of all the above recommendations should be discussed at a Project Implementation Committee meeting.

In addition, it was decided that the following recommendations of the evaluation (which were not formally discussed at the MRC meeting) should be considered by the PIC as to which ones needed to be accepted and acted upon and, if so, in what manner.

1. CTD must make the support and development of private sector industry its prime focus and incorporate it into their basic operating philosophy.
2. CTD Board should determine the requirements of external funding agencies to consider restructuring the CTD mobilization process philosophy and/or operations in order to attract significant external funding and attain sustainability for the mobilization process.
3. CTD management should provide USAID with succinct strategic, tactical, and budgetary plans as envisioned in the project paper.
4. USAID should support CTD in developing measures of performance for the mobilization process and subsidiary operations that will drive operations to achieve project goals.
5. CTD should limit the range of areas of activity, focusing on enhancing industrial participation and marketing of existing activities.
6. CTD should enhance their public relations and publicize their project concept and objectives to the industry and general public.
7. USAID should provide management counsel and support to enable the potential of the CTD mobilization process to be achieved.
8. CTD should increase the technical resources available to them on a regular basis in order to strengthen the process of evaluation of proposals, subsequent monitoring of projects, and to keep track of interrelated activities. USAID should reprogram certain funds as required to ensure the one-time ability to put such systems in place.

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9. USAID and CTD should review and simplify the approval cycle procedures within CTD, ICICI, and USAID to respond to proposals in an expeditious manner. CTD should approve and implement proposals quickly to maximize the opportunities for private sector involvement.
10. CTD and USAID should modify and implement reporting requirements to reflect the special nature of the CTD mobilization process.
11. CTD must develop and implement record keeping and reporting mechanisms to provide project level and aggregate reporting in a timely and consistent manner. Data about the CTD project, focus groups, support groups, individual projects, budget, and actual spending should be available. For this purpose, CTD is advised to hire a full-time manager with considerable project management experience.
12. CTD must develop and implement independent reporting and monitoring programs to track independent entities such as NALTECH and CPF that it has created.

Distribution:

D, WGBollinger  
DD, SPMintz  
PDI, JTarter  
CO, NNWahi  
PRO, BRPatil  
PDI, KCKapoor  
PDI, SNanda  
TDE, JAGrayzel  
TDE, AJYates  
TDE, RKBerry  
TDE, MReddy

*File*



UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT  
AMERICAN EMBASSY, NEW DELHI-110021

PHONE : 6865301 / 600651  
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MEMORANDUM

July 7, 1993

TO : DIR (A), Mr. Steve Mintz  
FROM : TDE, R. K. Berry *AKBerry*  
SUBJECT : Talking Points for CTD Evaluation  
Meeting with Mr. Nayak and Others

- Appreciate CTD assistance and cooperation in mid-term evaluation.
- Team was first class, with much experience in this area.
- Highlight some of the positive comments made by evaluation team regarding CTD accomplishments so far.
  - Success in establishing a process of resource mobilization to foster regional economic growth.
  - Development of academic/industry linkages and networking.
  - Significant human resource development through technician training programs.
  - Support to Women's Entrepreneurial program (AWAKE) as a potential source for new venture development.
  - Continuing attempts to raise funds for sustainability.
  - Initiating steps to replicate through efforts in Kumaon, Pune, etc.
  - Implementation of a portion of the first Applied Technology Centre (ATC) for Food processing.
- Team provided valuable insights into organization, process, and activities. Team noted opportunities for even greater impact of CTD process and activities.
- Note some of the significant findings that require actions for implementation by CTD.
  - Increase private sector participation in CTD Governing Board and Focus Groups. Note other USAID projects have greatly profited from this kind of participation (PACT, ACE).

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- Strengthening the proposal approval process and documenting the approval and/or rejection of the proposals according to the criteria laid down in PP. (Will help ensure focus, and that the best proposals are supported).
- Adhering to the reporting requirements of USAID and submission of complete reports to USAID on timely basis. (Otherwise, difficult to learn from experience for future efforts).
- Working towards creating better understanding and appreciation of CTD's goals, purposes, outputs, operations in order to make CTD concept and mechanism well understood by a broad audience and general public.
- Need to develop a simple presentation and/or documentation to provide a clear statement of CTD purpose for communicating with industry, finance, academia and government.
- Integrating support groups into the main focus groups.
- Jointly developing with USAID and implementing a time bound action plan for mid-course correction to bring CTD activities into compliance with programmatic requirements and guidelines laid down in the PP. (For greater impact by CTD process and activities).
- Emphasize USAID desire to participate as fully as possible with CTD, to be more proactive to draw on USAID's experience which have similarities with components of CTD.
- Communicate USAID plans to fund a professional manager's position. USAID appreciates all the donated time and expertise of so many talented individuals. They have been so successful that CTD has growing too busy to be managed part time. USAID will fund this position for the next (X) years. USAID will attend CTD Governing Board/Focus Groups meetings as an observer. (As we do in our other projects - PACT, PACER, ACE, TEST, etc.)

Clearance: AJYates (CID)



UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

MEMORANDUM

July 8, 1993

TO : DIR (A), Mr. Steven P. Mintz

FROM : TDE, M. Reddy *M. Reddy*

SUBJECT : Talking Points for CTD Evaluation  
Meeting with Mr. Nayak of CTD

In addition to the points listed in Mr. Berry's memorandum of 7/7/1993, it would be desirable if the following were also brought to Mr. Nayak's attention:

- The need to concentrate on the four focus areas. Exceptions such as the True Potato Seed (TPS) activity ought to be considered only if they are exceptional opportunities for CTD intervention and with the prior concurrence of ICICI and USAID.
- That CTD needs to consolidate the activities underway before "spreading" to other geographical areas, Kumaon being the exception.
- That CTD needs to adopt a result maximization philosophy rather than one of cost minimization.
- US Technical Assistance with repeat visits by consultants such as Myson Solberg, Jack Bishop, etc. would be very useful to CTD.
- The PIL, dated November 3, 1989 explicitly lists the aspects that ought to be considered while considering activities for funding under goal, purpose and output/input categories. For example, typical questions to be answered are: Will the rate of commercialization of new products by the industry increase? Will the training to be provided increase the trainers' capacity to contribute to the application of technology in their business and industry? CTD ought to explicitly consider these aspects when evaluating new proposals.

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**PROGRESS REVIEW**

Reporting Date: 16th December 1993

No.	Action	Responsibility	Target Date	Progress Review
A.	USAID participation in the GB and Executive Committee Meeting	USAID/CTD	From July	Mr. Steven P. Mintz attended the 25rd Governing Board meeting of CTD held on 27th July 1993. *
B.	Increased Pvt. Sector participation in the working groups. [Pvt. sector majority as the target]	CTD	Sept 30	Ongoing
Appointment of General Manager				
A.	Job description and advertisement format to be drawn up and sent to USAID/ICICI	CTD/USAID	July 31	Done
B.	Release of advertisement	CTD	Aug 10	The advertisement released by CTD on July 31 to Deccan Herald and The Hindu.
C.	Shortlist of candidates sent to USAID/ICICI	CTD	Aug 31	Sent on 30th August 1993

\* Mr. Dick Goldman and Ram Berry attended the 25th meeting held on Dec. 21, 1993.

Action No.	Responsibility	Target Date	Progress Review
D. Approval of short list	USAID	Sept 7	Received on 17th September 1993
E. Interview by search committee	CTD	Sept 20	Completed on 21st September 1993
F. Appointment of GM after approval by USAID	CTD	Sept 30	Received on 29th October 1993 (PIL 17 dated October 22, 1993)
G. GM in place Monthly reports	CTD	Oct-Nov	Discussions regarding terms and conditions of appointment have been held with the selected candidate. He has accepted to join CTD in the first week of January 1994.
A. Agreement on format and date of transmission	CTD & USAID	July 31	Done
B. First report [for June & July 93] due	CTD	Aug 15	CTD reports sent to USAID/ICICI on 14th August 1993 by Speed Post
C. Later reports	CTD	10th of (next month)	The Monthly report for the month of August 1993 sent on 7th September 1993

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Action	Responsibility	Target Date	Progress Review
Action Plan for implementation of changes			
A. Drawing up plan	CTD & USAID	July 30	Done
B. Formal USAID approval	USAID	Aug 6	To be received.
List of currently approved projects			
A. Drawing up list	CTD & USAID	July 31	Done
B. Formal USAID approval	USAID	Aug 6	Received by CTD on 6th August 1993
Management plan for the period Oct. 93 to Sept. '94			
A. Preparation of Draft by CTD Secretariat	CTD	July 10	Done
B. Administrative approval by CTD Governing Board	CTD	July 31	Done at July 27th meeting.

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Action	Responsibility	Target Date	Progress Review
C. Technical Sanction by Executive Committee after following new procedures	CTD	Aug 31	CTD Executive Committee gave Technical Sanction on September 10th.
D. USAID/ICICI approval  Strengthening the proposal review and documentation process	USAID/ICICI	Sept 15	CTD formal letter for approval by ICICI/USAID sent by Speed Post on 20th September 1993
A. Identification of elements of proposal review process that need strengthening	CTD/USAID	July 31	Done
B. Transmission of sample format to USAID	CTD	July 31	Done
C. Formal approval of proposal review process	USAID	Aug 6	To be received

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Action	Responsibility	Target Date	Progress Review
D. First proposals using new process sent to USAID	CTD	Aug 20	Given to the Project Officer, USAID at Bangalore on 26th August 1993
E. Documentation for old cases to be completely in places	CTD	Sept 30	Ongoing

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