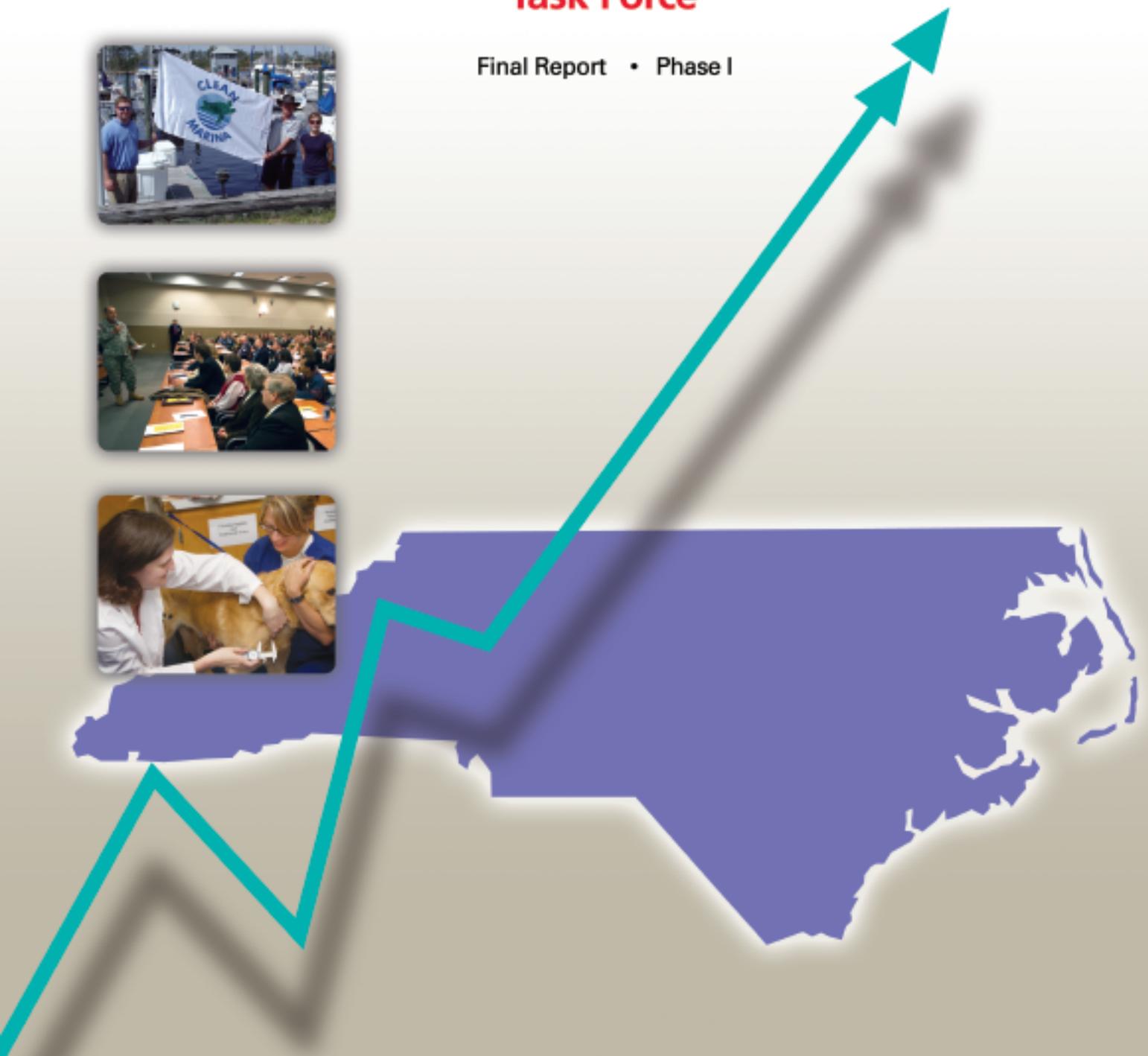


Impact!

Benchmarking Economic Development Impacts Task Force

Final Report • Phase I



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Final Report • Phase I

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January 2008

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Abstract

Anticipating that NC State University will be expected to provide economic development impacts, the Benchmarking Economic Development Impacts (BEDI) Task Force was established, launched, and completed the first phase of its work. This final report of that work includes details of the task force deliberations, the supporting development work, meetings with focus groups, and its final recommendations.

Background

North Carolina State University aspires to be an “Exemplary Land Grant University” (2000 Report of the Commission on the Future of NC State). Like many research extensive universities across the country in 2005, NC State University had wide-ranging levels of understanding, measuring and reporting regarding the economic impact resulting from its engagement activities across the state and beyond. Mounting pressure to better measure economic impacts across activities developed from both internal and external groups. The Carnegie Foundation initiated the engaged university credential, which NC State sought and earned. It was in that pursuit that the administration realized how much activity was ongoing and how little of the activity outcomes were measured (Carnegie Report, September, 2006).

Shortly afterward, NC State University considered responding to a request for proposal on a grant from the Kaufman Foundation to build an Entrepreneurial Initiative. The grant proposal clearly specified a means by which the institution would measure the impact of the proposal. At around the same time, the University of North Carolina General Administration undertook the UNC Tomorrow process whereby the expected effect of the university system on the economy of the state would be determined (UNC Tomorrow, Final Report, December, 2007).

In response to these initiatives, Vice Chancellor Jim Zuiches (Vice Chancellor of Extension, Engagement and Economic Development) organized a broad-based, university-wide task force in 2006. Appendix A includes a full list of participants with a brief description of each individual's interest in the subject and their tenure on the task force.



The task force was charged with four assignments:

- 1.** Inventory the activities/events designed to create an impact for economic and/or community development with any and all geographical reaches (city, county, region, state, etc.),
- 2.** Identify a set of outcomes expected from these collective activities. If the outcomes are expected beyond the planning horizon, identify intermediate outcomes that can occur within the planning horizon.
- 3.** Based on this set of outcomes, determine and recommend meaningful metrics that can be reasonably tracked, and
- 4.** Develop and recommend criteria to set goals

The task force began its work in January, 2007 and completed its first series of tasks by May, 2007. In the fall of 2007, a smaller group of the original task force members fulfilled the obligations to obtain feedback from groups who are actively involved in the eight engagement activity categories. This report documents the findings of both phases of this task force's work and establishes the framework for future related task forces and their necessary work products.

Associated Work from Other Institutions

As a backdrop throughout the deliberations, the task force members gathered, reviewed, and summarized numerous related bodies of work. Fundamental reports included numerous items from the NC Progress Board and the Societal Engagement Criteria from the WK Kellogg Foundation's report on the Engaged University.

Seminal work on understanding and measuring engagement activities has been done at Michigan State University. A number of documents were referenced in the task force's deliberations and will be cited in this report. The University of Delaware has developed and distributed survey instruments for measuring extension work. We found numerous institutions utilizing this instrument.

We also found two notable reports on university communities or clusters. One evaluated the potential economic development impact of Michigan's University Corridor – Michigan State University (<http://outreach.msu.edu/oemi/guest/AppLogin.asp>), University of Michigan, and

Associated Work from Other Institutions (continued)

Wayne State University. A similar assessment report of the eight research universities in the Metropolitan Boston Area was reviewed.

Interviews with some follow-up documentation were conducted with personnel from the National Association of State University and Land Grant Colleges, the University of Massachusetts (http://www.umass.edu/outreach/about/outreach_other_universities.html), Kansas State University (<http://outreach.msu.edu/powerpoints/scholarshipfocus.pdf>) the University of Kentucky (http://ces.ca.uky.edu/ces/documents_materials.htm), Purdue University (<http://www.umorepark.umn.edu/ovprssrd.html>), and the University of Minnesota.

Our general conclusion from study of the documents available from these other institutions was that the evaluation instruments developed elsewhere were more focused on internal measures of the human and financial RESOURCES, ACTIVITIES, and OUTPUTS from these other institutions than they were on the societal OUTCOMES and especially the economic and community development IMPACTS of these programs on society. Thus, we decided to press on in our Task Force work toward metrics of real societal OUTCOMES and also societal IMPACTS using the concept of Logic Models as described later in this Final Report for the BEDI I Task Force

Aligning Direction

The task force immediately found it necessary to establish common understanding and definitions in order to accomplish its work. The most important of these discussions revolved around the distinction between “economic development” and “economic growth.”

The agreed lexicon became:

- *Economic Growth* is economic activity that leads to short term job creation.
- *Economic Development* is the intersection of public policy and private commerce for job and wealth creation. It creates the capacity for self-sustaining Economic Growth for the Long term.

The importance of this distinction is critical to the intended measure of economic impact.

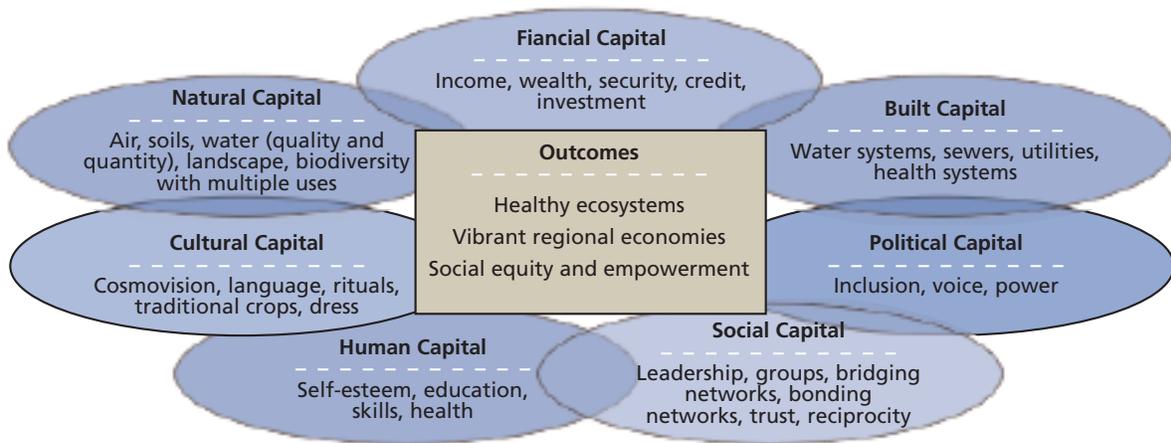
Economic impact can be easily measured at the very definitive level of economic growth.

However, comprehensive economic impact must measure not only direct economic growth, but also impacts on the macro-level economic development which induces sustained economic growth over the long term.



The task force found common understanding of the distinction between economic growth and economic development for the purpose of our assigned task when introduced to “Community Capitals: A Tool for Evaluating Strategic Interventions and Projects”. The chart below is central to the task force’s common understanding.

C O M M U N I T Y C A P I T A L



“Community Capitals: A Tool for Evaluating Strategic Interventions and Projects”
 Cornelia Butler Flora, Mary Emery, Susan Fey and Carry Bregendahl
 North Central Regional Center for Rural Development
 Iowa State University

This chart articulates the interdependence and necessity of the multi-faceted components of real economic development. Without adequate capital in all seven areas, economic growth and associate community development is not sustainable. Therefore, support of any of these capitals will induce economic growth but may not directly influence economic growth. Indeed, many engagement activities have major impact on economic development but cannot be directly tracked to economic growth in a reasonable time frame.

Based on these deliberations regarding common definitions, the task force developed purpose, use and domain statements to guide a consistent and comprehensive assessment. These statements are attached as Appendix B. With these statements as guideposts, the task force agreed to:

- Refine and categorize a comprehensive engagement inventory.
- Develop and refine categorical logic models.
- Pilot the development of a logic model with a specific broadly based university unit.
- Develop the means by which to measure direct impacts on economic growth.

Engagement Inventory

The responsibility of taking stock of an engagement inventory at NC State University became no small task. The team assigned to the Carnegie Classification application and the June 2007 summary document prepared for the UNC Tomorrow Initiative “Leading, Connecting, Transforming: Meeting the Needs of North Carolina: 100 NC State Programs that Impact the State” established an enormous storefront of activities, but gaps were found even in these lists.

Thus, the task force came to two conclusions:

- The inventory will and should be a living list as new activities are identified and others diminish in their contribution.
- A means of organizing these activities was imperative to continue our work in the next steps.

We referred to a body of work from Michigan State University (MSU) as starter material. MSU had developed a list of seven engagement categories. Over a year’s period of time, the task force customized, consolidated, modified, and added to these categories to develop a significantly different list of eight categories that identify major activities which define NC State’s broad portfolio of extension and engagement activities in a manageable way.

The eight categories and their definitions are as follows:

- 1. Curricular in Classes and Programs** — Courses and instructional programs that offer student academic credit hours, certificates of completion or continuing education units, or meet requirements of occupational licensure. These classes have an outreach component if they are designed and marketed specifically to serve those who are neither traditional campus degree seekers nor campus staff. It also includes civic or community service that NCSU students perform in conjunction with an academic course or program that incorporates frequent, structured, and disciplined reflection on the linkages between the activity and the content of the academic experience. Other forms of experiential learning may include career-oriented practica and internships, or volunteer community service. (Examples: McKimmon Center for Continuing Education, Distance Education & Learning Technology Applications)
- 2. Co-curricular Service Activities** — Organized, extra-curricular civic or community service that NCSU students perform in addition to academic coursework or programs. (Examples: Student Affairs, University Scholars Program, Study Abroad)
- 3. Knowledge Creation and Diffusion** — Activities that develop, share, analyze, test and demonstrate new knowledge. Such activities are considered engagement when they are conducted in collaboration or partnership with external constituents. (Examples: Wood Science, Forestry Tree Improvement Cooperative, Center for Innovation Management Studies)
- 4. Technology Transfer and Commercialization** — Activities include applied research, capacity building, evaluation studies, policy analysis, demonstration projects, technology commercialization

and technology transfer embedded in Intellectual Property. Such activities are considered engagement when they are conducted in collaboration or partnership with schools, health organizations, nonprofit organizations, businesses, industries, government agencies, and other external constituents. Most generally they are intended to directly impact external entities or constituents while developing new knowledge and commercial enterprises. (Examples: Office of Technology Transfer, Management, Innovation & Entrepreneurship, Networking Technology Institute)

5. **Public Events and Understanding** — Resources designed for the public include managed learning environments (e.g., museums, libraries, gardens, galleries, exhibits); expositions, demonstrations, fairs, and performances; and educational materials and products (e.g., pamphlets, web sites, educational broadcasting, and software). Most of these experiences are short-term and learner-directed. (Examples: Institute for Emerging Issues, Millennium Lecture Series)
6. **Technical and Expert Assistance and Training** — Activities where NCSU personnel respond to requests from individuals, programs, or agencies and organizations external to the university by sharing their knowledge, expertise, and skills in order to help those entities build capacity to achieve their goals. NCSU personnel provide this assistance through direct interaction with the external constituency (as opposed to responding by delivering a pamphlet or reference to a Web site or the like). Activities may focus on using expertise to address or improve the effectiveness and efficiency of the organization or to improve knowledge and skills. This category includes such activities as consulting work that is performed for the benefit of the constituent, expert testimony and other forms of legal advice, assisting agencies and other entities with management and operational tasks. Technical assistance is much broader than providing technology-based assistance even though this might be a form of technical or expert assistance. (Examples: Industrial Extension Service, Manufacturing Extension Partnership, Small Business and Technology Development Center)
7. **Clinical / Diagnostic and Testing Services** — All client and patient (human and animal) care provided by university faculty through unit-sponsored group practice or as part of clinical instruction and by medical and graduate students as part of their professional education. For example, this may include medical/veterinary clinical practice, counseling or crisis center services, and tax or legal clinic services. (Examples: Plant Disease and Insect Clinic, Small and Large Animal Hospital, Food Flavor and Textures Testing Unit)
8. **University / Industry Research Programs** — All collaborative and cooperative activities whereby university and multiple industries resources are pooled for shared results such as membership consortia and resource centers. (Examples: Cooperative Tree Improvement and Forest Nutrition Programs, Non-Wovens Cooperative Programs, Semiconductor Power Electronics Center)

Logic Models

Early in the task force discussions, the group agreed to distinguish our “economic impact” assessments from those that are widely publicized for universities. In fact, one of the task force’s original members had conducted an economic impact study of NC State University. These studies precisely identify the expenditures that occur in the general proximity of campus from students, faculty, and staff being located on campus and from people attending recreational events on and around campus. The economic impact of interest to our task does not center on the expenditure effects. Rather, the resultant assessments of this work should focus on the economic impacts from the “knowledge effects” of the university. Those knowledge effects result from campus proximity and beyond (See graph in Appendix C).

Furthermore, the land grant tradition of NC State University informs a culture of engagement that is evident across all three primary scholarly functions of teaching, research, and extension. As such, knowledge effects ultimately result in economic impacts from any and all engaged activities, regardless of the activities’ primary function. Returning to the concepts outlined in the community capitals, the group presumed that all of these activities would lead to common impacts. Understanding these common impacts leads us to a common set of measurement potential (See graph in Appendix C).

The task force employed logic models to determine impacts. Logic models are analytical tools widely used in many fields to depict the relationships between planned work and expected results. The WK Kellogg Foundation recommends the use of logic models in extension work so that, with a visual roadmap, stakeholders can fully participate in planning and evaluating extension programs. Building logic models became a core function of the task force.



The task force adopted the WK Kellogg Foundation's definition of logic model components:

Inputs or Resources include the human, financial, organizational, and community resources the institution has available to direct toward doing the work.

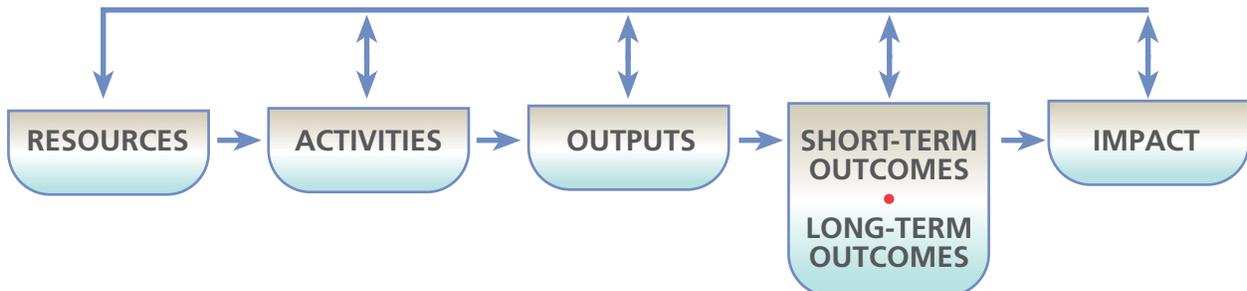
Activities are the research, educational and engagement processes, tools, events, technology, and actions that are an intentional part of the program implementation.

Outputs are the direct products of program activities and include many different types, levels and targets of services to be delivered by the program – such as students with knowledge, skills, and bachelors, masters, or doctoral degrees, publications, and policy analysis and recommendations.

Outcomes are the specific changes in program participants' behavior, knowledge, skills, status and level of functioning. Short-term outcomes should be attainable within 1-3 years, while longer-term outcomes should be achievable within a 4-6 year timeframe. The logical progression from short-term to long-term outcomes should be reflected in impact occurring within about 7-10 years or even longer.

Impact is the fundamental intended or unintended changes that occur in organizations, communities or systems as a result of research, educational and societal engagement program activities within 7-10 years. In the current model of WK Kellogg Foundation grant making and evaluation, impact often occurs after the conclusion of project funding.

Below, is a generic model:



Logic Models (continued)

Task force members drafted logic models for each of the eight categories. The drafted models were then shared with individuals across campus who were not involved on the task force but who were intimately involved with these eight categories of engagement activities on a daily basis (Session participants are listed in Appendix D). Focus groups made up of carefully selected individuals whose primary or major work accomplishments were in a particular category were convened to engage in feedback and make modifications and changes to the logic models. The models were updated accordingly and are presented in the following pages.

Collectively, the experiences with the focus groups provided insight to a set of common impacts:

- **Monetized Impacts** — new products and services, more jobs, higher income, cost savings
- **Improved Infrastructure and Built Resources** — such as improved transportation systems, health services, etc.
- **Enhanced Natural Resources** — environmental improvements, water system enhancements
- **Human and Social Empowerment** — community growth, improved public policy, stronger leadership
- **Quality of Life** — Cultural enrichment, improved community self-image

Of these impacts, the task force agreed that in Phase I of this BEDI project, we would focus our efforts mainly on developing metrics for the monetized economic impacts. In other words, we would identify ways to measure the direct influence of societal engagement activities at NC State University on the economic growth within our state, region, nation, or the world as a whole.

The Importance of Understanding the Relationships in the Models

Working with the logic models and understanding the relationships in the models became a key focus of the task force. Logic model construction has many advantages in creating an understanding and common language for the real purpose associated with resource requests and/or activities. It develops congruence with strategic goals and accountability. It also can drive more meaningful measurement.

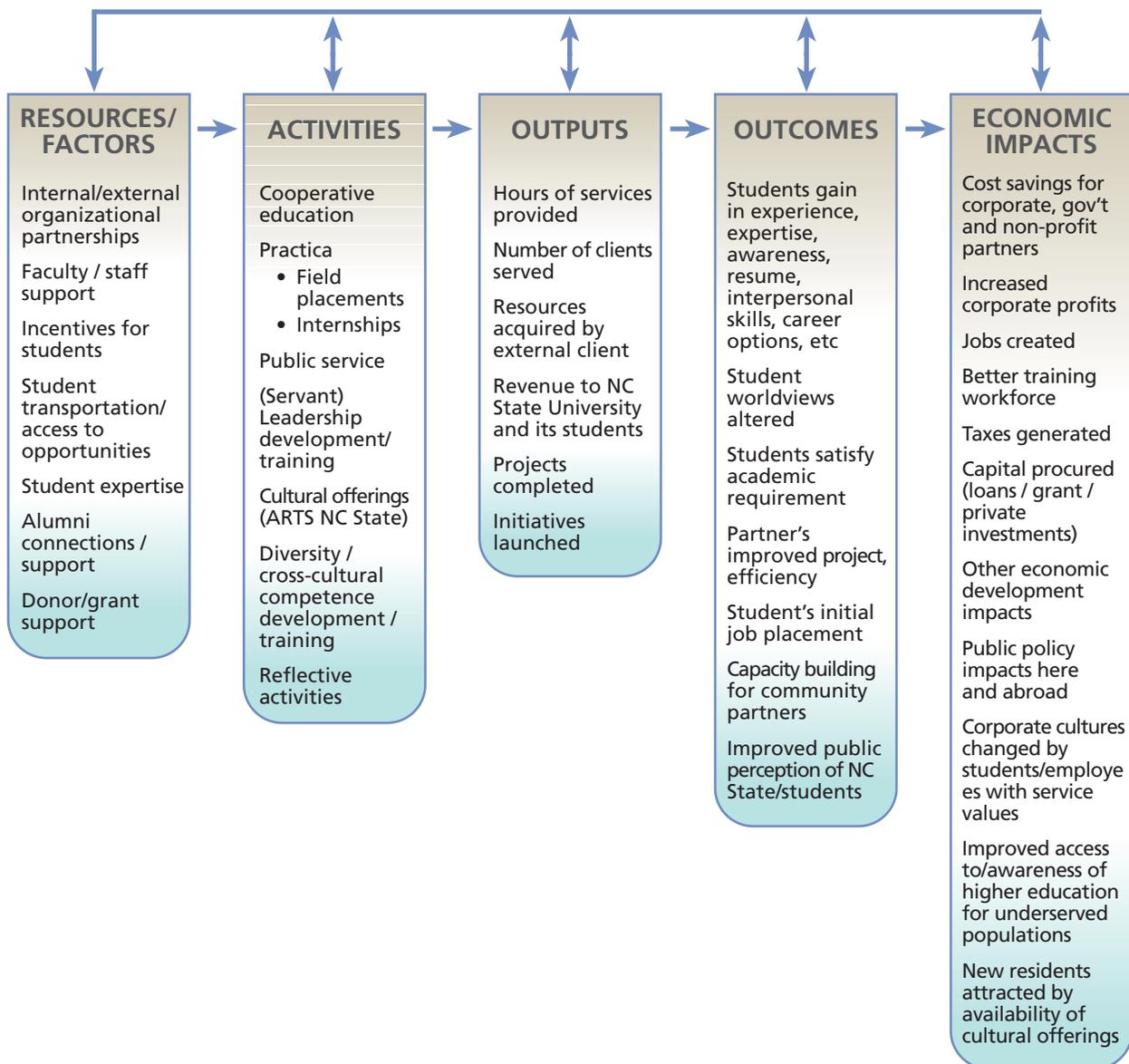
Measuring impacts is often very difficult, if not impossible. The impacts may occur too far in the future, often taking as long as ten years to develop. Also, a significant impact often relies on numerous factors and the importance of the particular input or activity to develop the impact cannot be discretely measured. In these cases, clearly articulating and gaining understanding of the relationship between an activity, its outputs, outcomes, and impacts is imperative. The model may prove that impact measurement is too difficult.

Impact measurement is always preferred, but when unreasonable to measure meaningfully, understanding the path to the impact is necessary and equally important. With this understanding, the dialogue can then seek to define what outcomes should be measured. Outcomes occur within a reasonable timeframe and are more discrete.

The pilot experience bears on the final point in understanding models for the purpose of measuring impacts or outcomes. The pilot experience proved to the task force that a true measurement must involve those that experienced the outcome or, even better, felt the impact. Therefore, true measurement must be as described by the user or beneficiary.

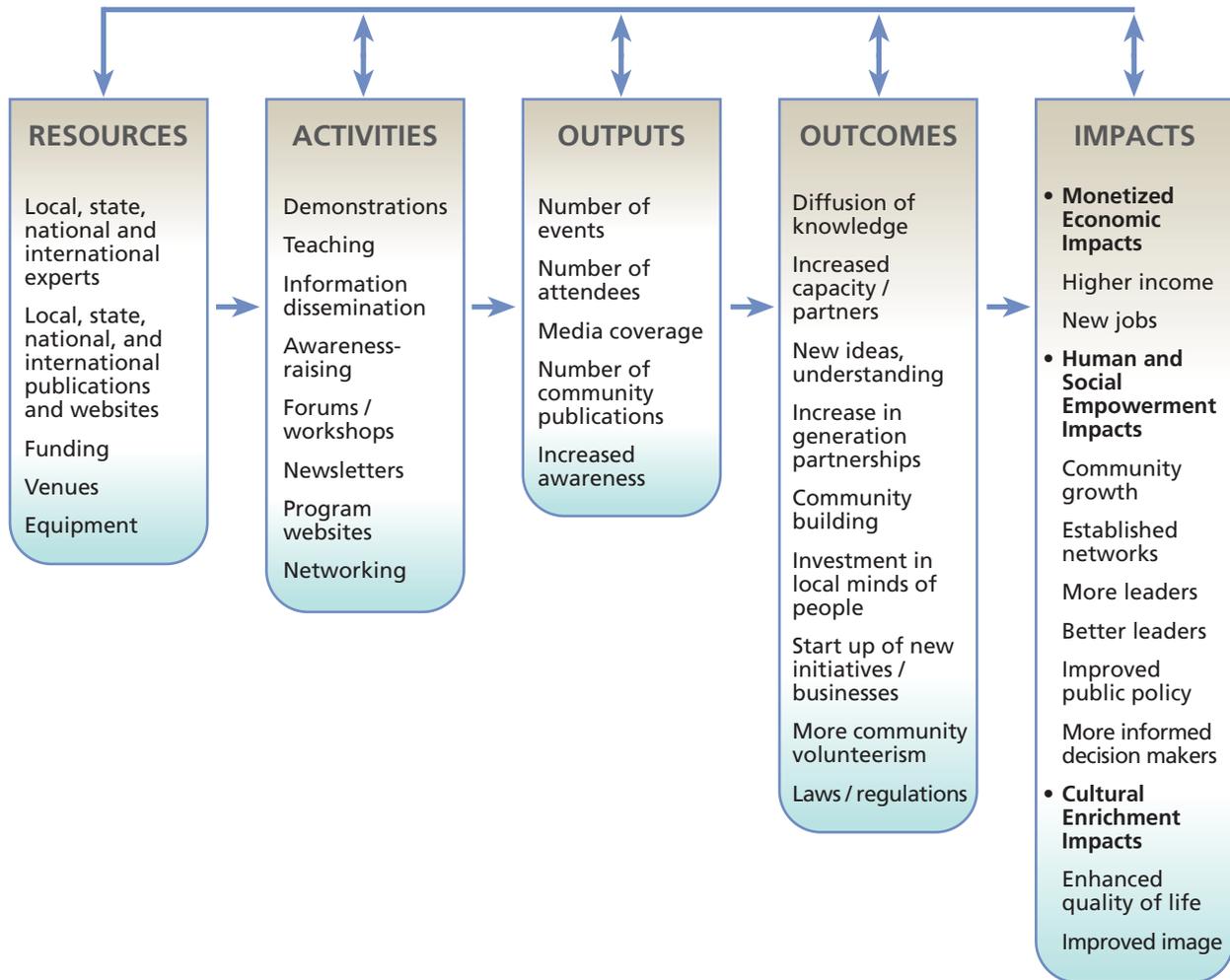
The Logic Models for each of the eight categories are as follows:

Logic Model for Co-curricular Student Engagement

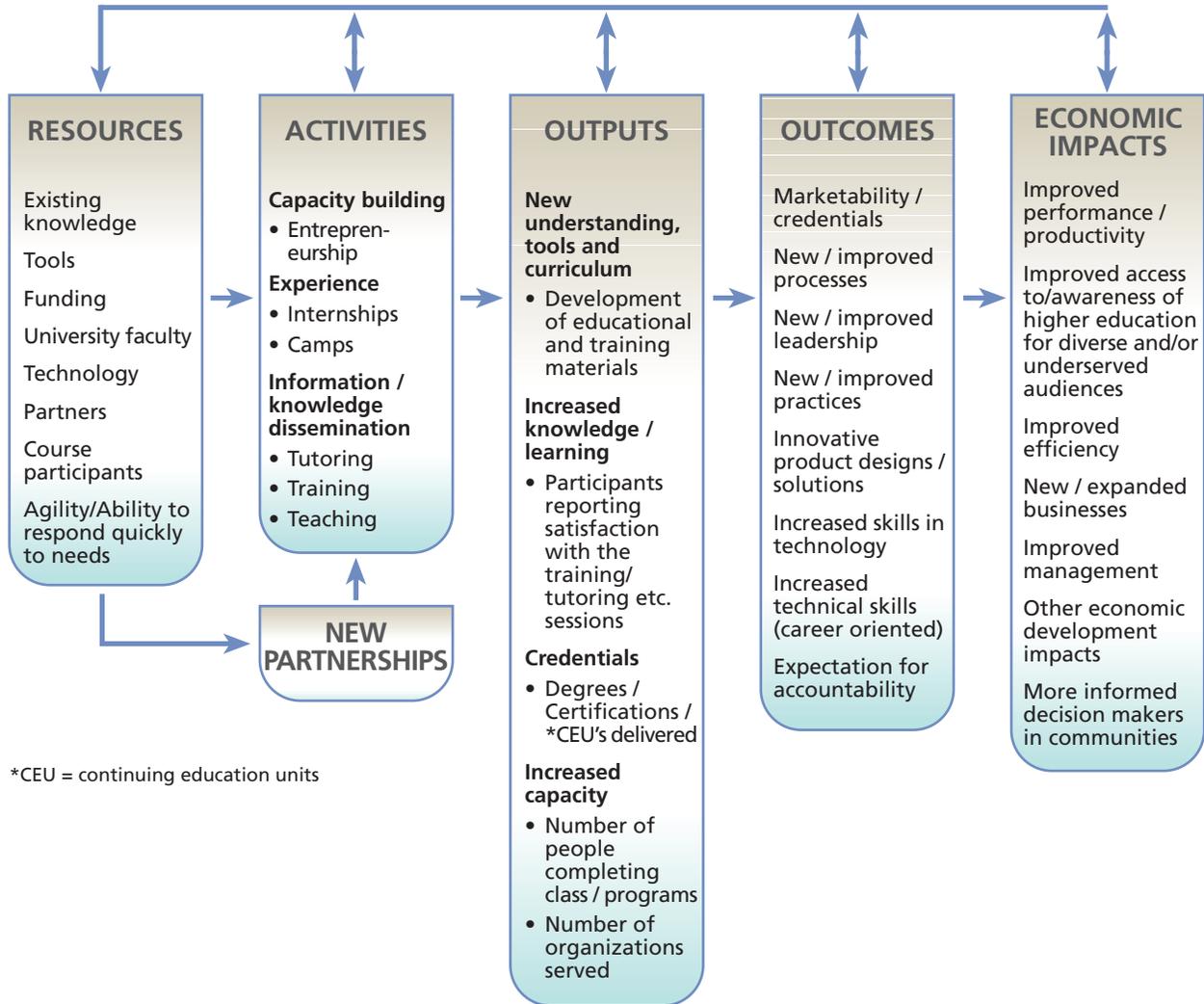


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Logic Model for Public Events and Understanding



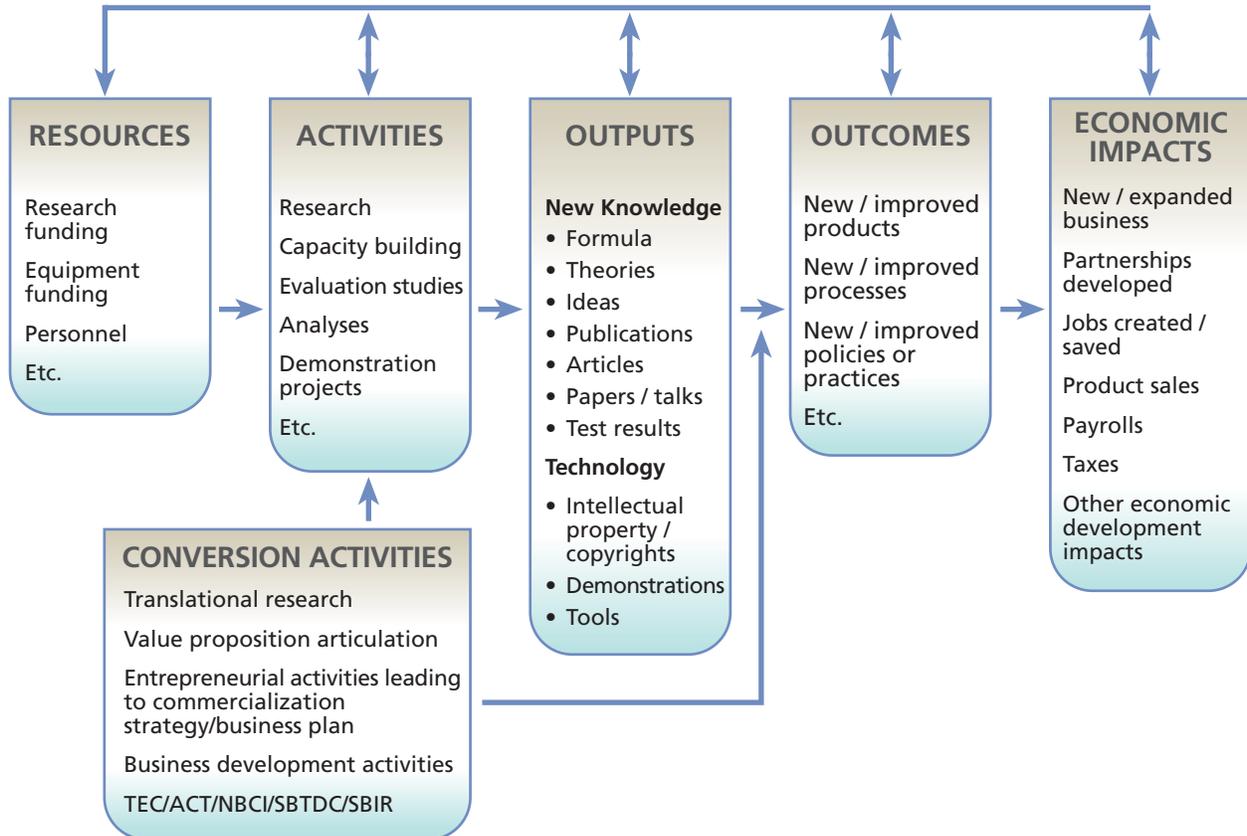
Logic Model for Classes and Programs



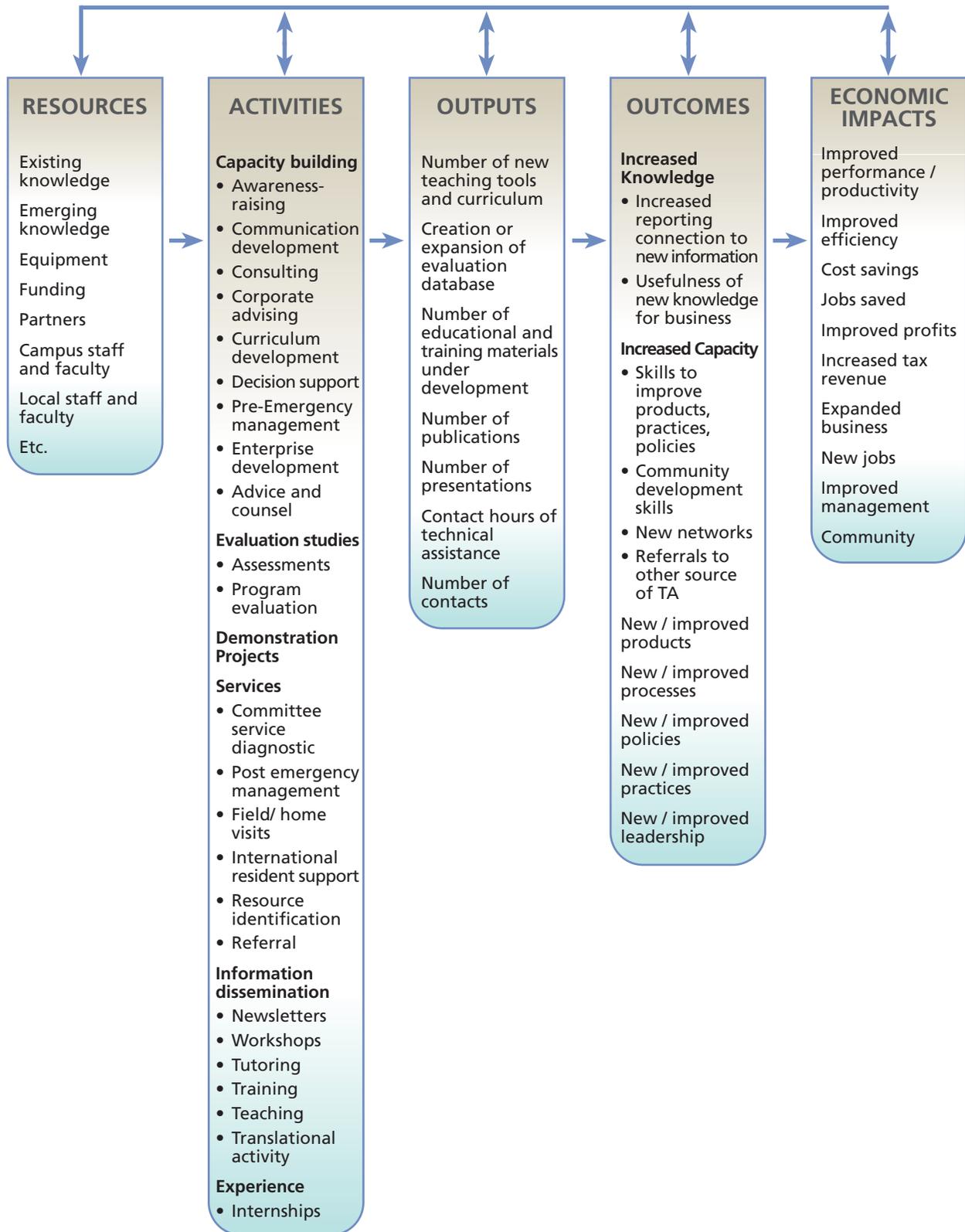
*CEU = continuing education units

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Logic Model for Technology Transfer and Commercialization

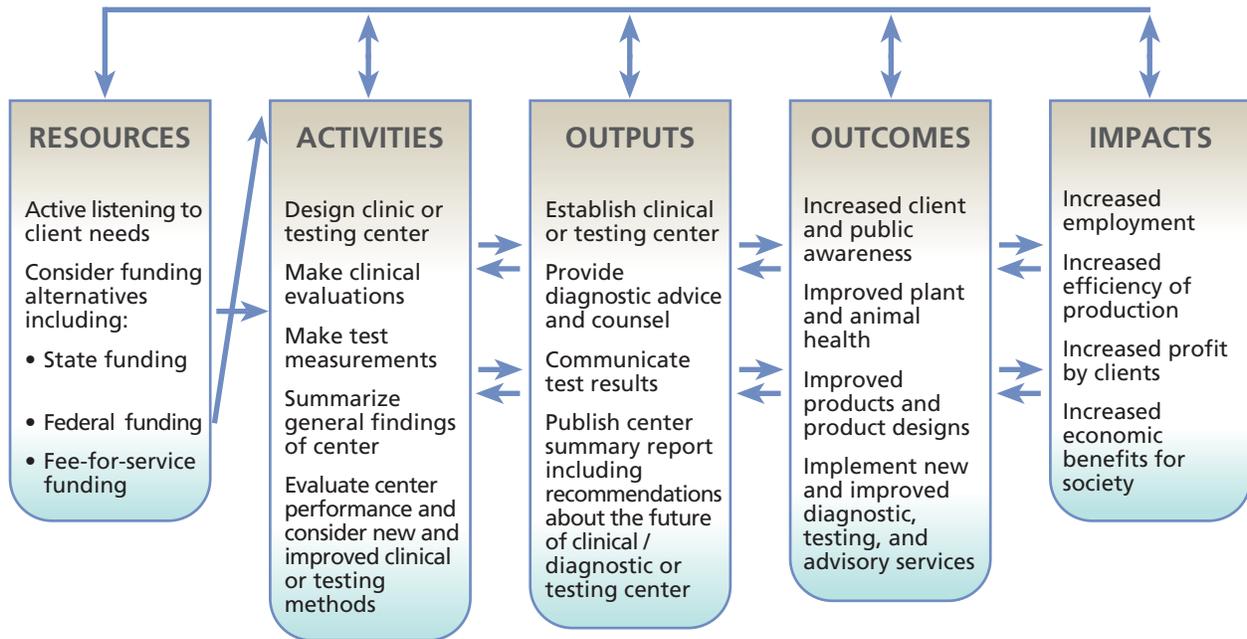


Logic Model for Technical / Expert Assistance

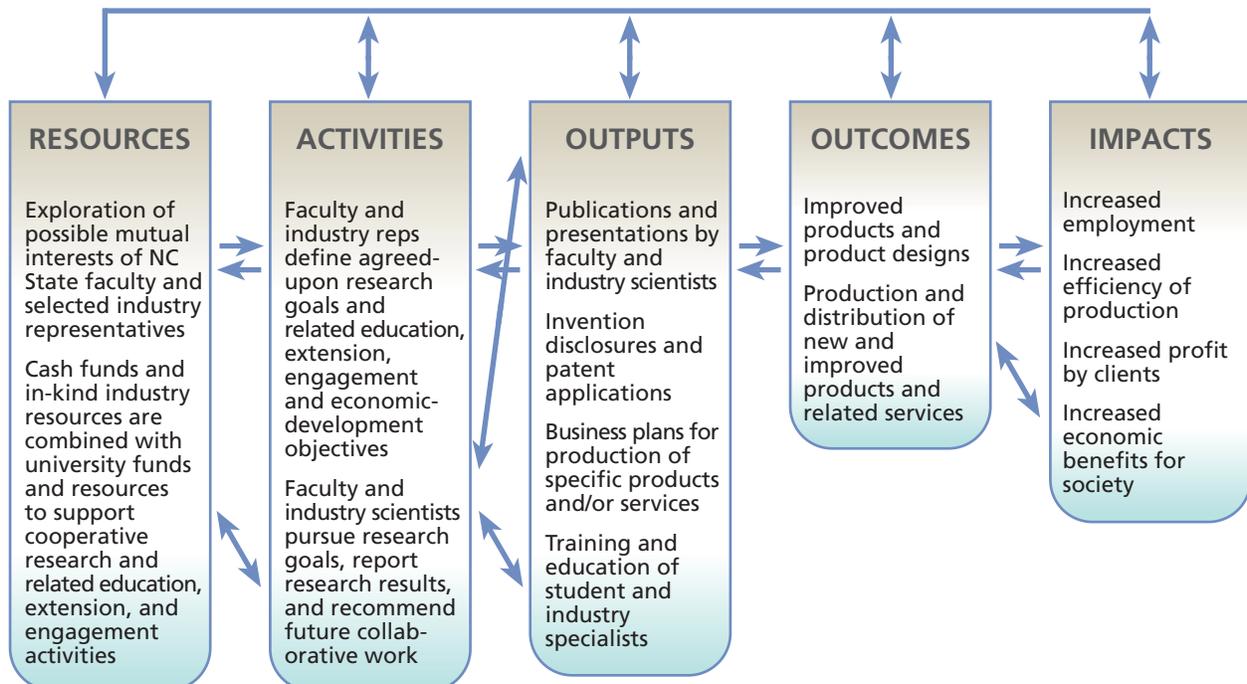


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Logic Model for Clinical / Diagnostic and Testing Services



Logic Model for University-Industry Research Programs



The Pilot Experience

In order to test assumptions and further cultivate real experience, the task force chose one of the represented organizations on the task force, the NC State Climate Office, to use as a pilot. The State Climate Office had previously begun to explore options for being able to report its effect and accepted the opportunity.

The State Climate Office of North Carolina (SCO) is a public service center and research extension of the UNC system housed at North Carolina State University. It was acknowledged by the American Association of State Climatologists as one of the first officially recognized State Climate Offices. The mission of the SCO is to provide climate related services to the state, local and federal agencies, businesses and the citizens of North Carolina.

In cooperation with state agencies, the SCO maintains and operates the NC Environment and Climate Observing Network (ECONet), a network of high-quality environmental monitoring stations. ECONet stations record standard meteorological parameters plus other critical parameters such as solar radiation, soil temperature, soil moisture, and evaporation.

Weather data are archived in the Climate Retrieval and Observations Network of the Southeast (CRONOS) database. CRONOS archives data from the ECONet and several other monitoring networks. Data are publicly available through the climate office website. Data from the ECONet and CRONOS support a wide range of value-added applications and decision support tools.

The climate office is continuously working on innovative products and applications to serve all sectors of our economy that are sensitive to weather and climate, which is estimated at nearly one-third of the economy. They became interested in measuring the impact that delivered applications have on the people who used the data when the SCO Associate Director became assigned to the task force and he volunteered them as the pilot organization.

In essence, the SCO used tools as they were being produced. They first had to understand how their data was used - who the customer is, how the information is used, and to what benefit. The SCO group used the drafted logic models as insight to develop their own single model (Completed model shown in Appendix E). Through deliberations with the SCO, it became clear that the models and impact discussions needed to distinguish between doers, users, and beneficiaries. The general distinctions are discussed below. In addition to getting "hands on" experience with the model-building and understanding, the most relevant finding of the pilot experience was the importance of determining the real benefit of the activity, or, in logic model terms, the outcome and impact from the person, organization, or community who developed the outcome or felt the impact.

Doers vs. Users vs. Beneficiaries

Understanding the relationships once the activity has been conducted relies on the interactions between what the task force distinguished as doers, users, and beneficiaries. Doers are the people who gather the resources and conduct the activity with an expected output. They monitor and can count inputs, activities and outputs.

Users are those involved in the activity that will utilize the outputs. They may become the beneficiary, but rather, they may use the output to influence a change in others. Those that actually experience the change are the beneficiaries. It is the beneficiaries that can report the real effect, outcomes or, ultimately, impacts of the activity. The pilot experience clarified the importance of identifying the beneficiary in order to really measure impact.

Monetized impact measures

When we talk of “monetized economic impacts,” we are really talking about is community wealth - whether that goes into the pockets of individuals or governments. NC State University does an enormous amount of work positively impacting the lives and economic condition of our state, country, and world. Some university activities have a direct, obvious, and immediate impact — like helping a business owner understand and implement a new process that makes them more efficient and saves their company money. Others are less obvious and take longer to recognize a financial impact — such as student teams designing a wetlands preservation park for a local municipality.

With the diversity of outreach and engagement work being done by NCSU faculty, students, and staff, it would be impossible to devise a one-size fits all data collection system or methodology. No matter what data is collected, there can never be an expectation that the resulting impacts are complete and 100% accurate. The only way to ensure that information such as revenues received, workers paid, and taxes contributed is true would be to look at individual company records and/or access their filings with their state Employment Security Commission and Department of Revenue — a legal and bureaucratic impossibility. In lieu of official hard data, the only way to get information is by asking the client directly about the outcomes and impacts of NCSU services.

Judgments will have to be made as far as what data/information is “reasonable” to gather. When services are rendered directly to a business client, data such as sales/revenues, investment capital procured, and employment changes that are attributable to NCSU’s work could certainly be attained by surveying the clients themselves.

When NCSU assists government organizations and non-profit community groups, determining economic impact becomes more complicated. For this group, clients may not be aware of the complete monetized impact. Surveys would be useful to understand the outcomes of NCSU's work — leaving impacts to be calculated by an economist.

Aside from measuring monetized impacts, there may be value in measuring perceived value — especially to non-business clients. Although it may not be as scientific as everyone would like, asking a client a series of opinion questions can be useful - at least as an internal benchmark. Questions may include:

- Please rate the quality of the services received.
- Are you aware of available resources that could produce equivalent assistance, regardless of cost?
- How much would it cost your community/organization to receive equivalent assistance?
- Knowing what you know now, how much would you have been willing to pay for the service you received from NCSU?

Data would need to be collected through primary research. Survey methods may vary based on the types of clients, their location, their technological capabilities/preferences, and the sensitivity of the information asked. Options certainly include: mail, email, telephone, and personal interviews. Examples of surveys the Small Business & Technology Development Center and the Industrial Extension Serviced have used to measure impact are included as Appendix F.

To ensure accuracy and consistency and minimize biases, all data collection would ideally be done by outside and impartial professionals. The number of annual clients that NCSU serves requires the assistance of someone with large resources. The Survey Research Center at East Carolina University has the greatest capacity to conduct large-scale surveys of anyone in the UNC System.

Costs obviously are a significant barrier to measuring impact. To save money, it is possible to have individual departments/units conduct their own data collections. However, significant coaching and coordinating would need to be done by someone or some group on campus.



Conclusions and next steps

This task force has developed numerous contributions for NC State University's quest to fully measure its economic impacts:

- A more comprehensive inventory of engagement activities,
- Engagement categories that better describe the range of engagement influence in our work,
- Common definitions to discuss the issues of measuring engagement and its impacts,
- A method of discussing the relationship our engagement resources and activities are intended to have on outcomes and impacts,
- A case study that proves the relevance of the tools developed,
- A set of options for measuring monetized impacts,
- An implementation plan for next steps.

Two main tasks have yet to be done and are worth continued work:

- A plan for implementing the recommended process to achieve a measurement of impact of NC State University on economic growth; and
- Advancing the measurement of impacts through the logic model process to other realms of economic development outside of economic growth.

The task force believes that the pilot experience should be expanded to include a wide representation of organizational units. These pilots will result in an effective toolkit that responds to a whole variety of encounters in implementation. A next-generation task force could then evaluate and incorporate the experiences of various organizational units into a recommendation for how this may spread campus-wide. This work should dove-tail with the SACS assessment and hopefully will lead to broad acceptance and use of the concepts and tools developed.

Early in the task force deliberations, the task force determined the importance of a next generation task force responsibility to develop common methods of understanding and measuring economic development impacts that are outside the realm of economic growth. That is, develop measurement techniques for impacts in Improved Infrastructure and Built Resources; Enhanced Natural Resources; Human and Social Empowerment; and Quality of Life. Further, the task force came to understand the importance of involving people who represent the full gamut of engagement categories. The additional strength in understanding the intended impacts will make this next step more doable.

Accordingly, it is recommended that a BEDI II Task Force be established to work on the convergence and with the synergy of other efforts on campus to include: projects that are developing common faculty reporting processes; faculty development efforts; outcomes-based assessment efforts (university level survey research, academic, administrative, research and educational support outcomes based assessment processes, meeting SACS requirements); the compact planning process; and the current marketing efforts.

The following charges are recommended:

- 1.** Develop a common definition of benchmarking and determine a common understanding of the use of benchmarking in the context of this work.
- 2.** Complete at least one pilot project in each of the eight engagement activity categories and report on each, using logic models and other tools developed.
- 3.** Develop measurement techniques for the remaining impacts.
- 4.** Develop a web-based toolkit to include measurement techniques for the outcomes identified; samples of logic models from other institutions; basic information on how to develop logic models and how to include evaluation/assessment techniques; and common language, definitions, and other standards developed by and for BEDI.
- 5.** Determine information sources and reporting tactics.

Appendix A — Benchmarking Economic Development Task Force Members

Dr. Terri Helmlinger Ratcliff, Chair, is the Assistant Vice Chancellor of Extension, Engagement, and Economic Development and Executive Director of the Industrial Extension Service, which is one of the university's leaders in measuring economic development. She maintained membership throughout the task force tenure.

Mark Brooks is the Climate Services Coordinator and an Environmental Meteorologist at the State Climate Office of NC, a public-service center for climate-environment interactions housed at NC State University. Mark's interests include the use of climate information in the decision making process, socio-economic impacts of weather anomalies, climate change, and the economic value of climate information. He joined the task force in 2007 and maintained membership throughout the entire task force assignment.

Dr. Nancy Cassill is Professor and Interim Department Head of Textile and Apparel Technology and Management (TATM) in the College of Textiles and is noted for the economic development reports conducted for the NC Department of Commerce. Due to workload, Dr. Cassill had to resign from the task force very early in the first phase.

Dr. Ellis Cowling is an University Distinguished Professor At-Large from the College of Natural Resources and has been a persistent faculty advocate for enhancement of the commitment of NC State University to serving the people of North Carolina (see: "Reports" and "Carnegie Foundation for the Advancement of Teaching " at www.ncsu.edu/extension/publications).

Jeff DeBellis is the Director of Business Research with the Small Business and Technology Development Center (SBTDC) and has contributed to the task force throughout. His work at the SBTDC is heavily involved in market analysis and economic development research.

Dr. Denis Gray is a full professor in the Department of Psychology of the College of Humanities and Social Sciences and is a nationally renowned researcher and author in the topic of university impacts in economic development. Denis was a contributor throughout the process.

Karen Helm is the Director of University Planning and Analysis and provided excellent insights to measurement during the first phase of the task force work.

Dr. Susan Jakes is an Extension Specialist in Family and Community Development with the College of Agriculture and Life Sciences. Her research interests include economic influences in community development. She was a contributor in both phases.

Dr. Carol Kline is a Parks Recreation and Tourism Management Extension Associate and an Instructor with the College of Natural Resources. Her support of tourism across the state has created an interest in economic development effects. A job change curtailed Dr. Kline's participation during the first phase.

Dr. Ted Morris was the Director of the Economic Development Partnership. He moved to East Carolina University in the midst of the first phase.

Raj Narayan is the Associate Director of the Kenan Institute for Engineering Technology and Science where he is involved with initiatives regarding technology-based business creation and the role of universities, companies, and government organizations in facilitating technology-based economic development. He was a member of the task force throughout its tenure.

Dr. Jon Ort is the Director of the Cooperative Extension Service, an Associate Dean of the College of Agricultural and Life Sciences, and the Assistant Vice Chancellor of Extension, Engagement and Economic Development. Dr. Ort's schedule curtailed his involvement shortly after the task force launch.

Dr. Celen Pasalar is an Extension Planning Specialist and the Director of the Downtown Design Studio in the College of Design. She became a member midway into the first phase and served throughout the duration of the task force. The Dean of the College of Design asked Dr. Pasalar to serve as a representative of the College.

Deborah Porto is a Special Assistant to the Executive Director of the Industrial Extension Service. She is currently studying for her EdD at Western Carolina University and expects the BEDI topic to become her research topic. Ms. Porto had to curtail her participation due to travel restrictions midway through the first phase.

Dr. Mike Walden is a Professor in the College of Agriculture and Life Sciences and is a renowned economist in the state. He was unable to participate in the task force deliberations.

Appendix B

Purpose Statement

We believe that NC State University’s extension and engagement programs and activities are important to economic development in North Carolina and the wider community. Our purpose is to focus attention on NC State’s various partnership roles in the economic measures of these community capitals. Our intention is to define and inventory NC State’s societal engagement programs and activities, and then develop mutually agreeable ways to assess and quantify their economic impacts.

Use Statement

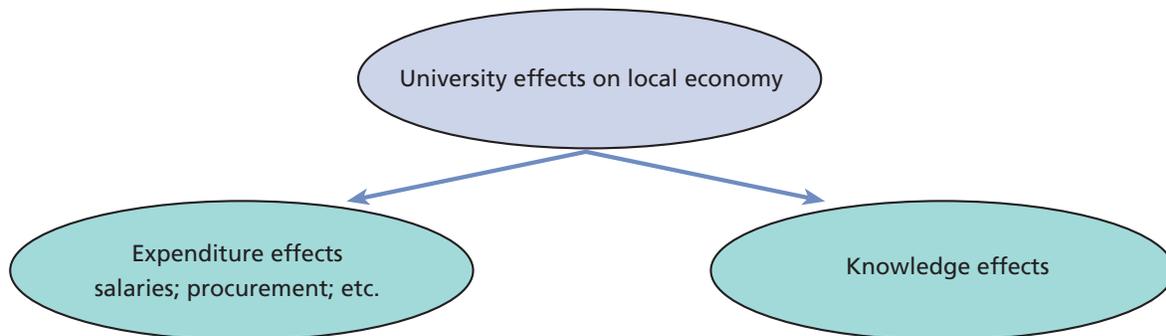
Define the methodology for designing standardized evaluation systems across all Colleges for NCSU outreach. The standardized evaluation could be used externally by stakeholders and internally for improvement and to increase outreach. Internal use may also include developing standards for what constitutes engaged scholarship and to create a database for information relevant to civic engagement.

Domain

Our domain includes the direct effects and practical applications of knowledge development and creation at NCSU.

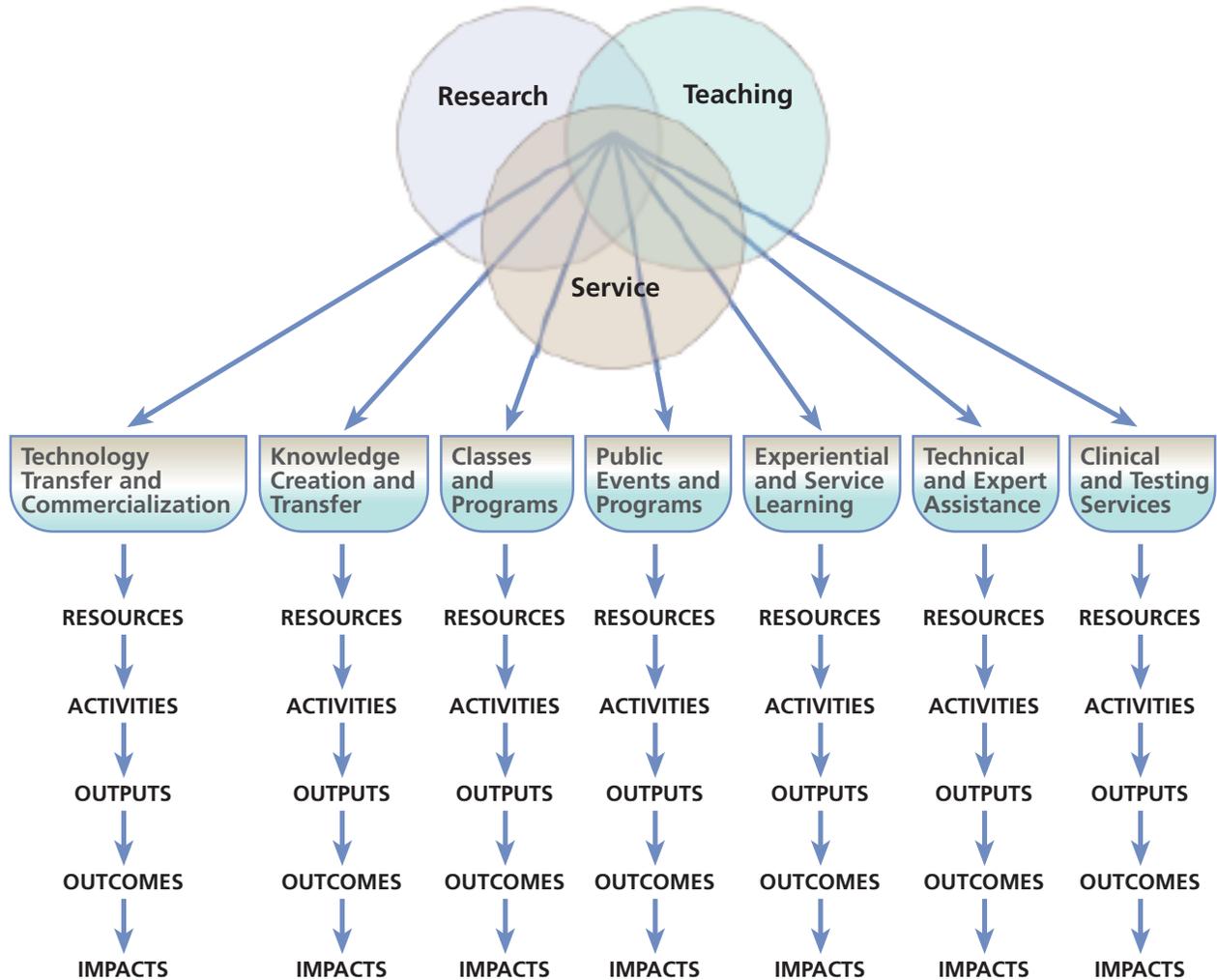
Appendix C — Knowledge Effects and Measurements

UNIVERSITY EFFECTS ON ECONOMIC DEVELOPMENT



Impact!

Appendix C — Knowledge Effects and Measurements (continued)



On what impacts would you like to be measured?

Appendix D

Participants in “doer” sessions

Technology Transfer and Commercialization and Industry University Research Activities

Hosted by Raj Narayan, January 4, 2008
at the Kenan Institute for Engineering, Technology & Science

Participants: Denis Gray, Raj Narayan, Ruben Carbonell, Ted Baker, Ken Swartzel, Chris Brown, Billy Houghteling, Michael Zapata, Tom Miller, Paul Mugge, Michael Seibert, Joni Spurlin, Roger Debo, George Rozgonyi

Knowledge Creation and Diffusion

Hosted by Mark Brooks and Carol Kline, January 28, 2008

Participants: Joe Denig – Wood science, Steven McKeand – Forestry Tree Improvement Cooperative, Paul Mugge – Center for Innovation Management Studies, Fred Yelverton – Turf center

Co-Curricular Student Engagement

Hosted by Courtney Thornton, January 8, 2008

Participants: Evelyn Reiman, Ingrid Schmidt, Michael Giancola, Alex Miller, Arnold Beel, Bengt Carlson, Chaffee Viets

Clinical and Diagnostic Testing and University-Industry Cooperative Programs

Hosted by Ellis Cowling, January 14, 2008

Participants: Terri Helmlinger Ratcliff, Courtney Thornton, Joni Spurlin, Benham Poutdeyhimi, Troy Nagle, David Dorman, Michael Davidson, Tom Creswell, David Byrd, Maryanne Drake, Steve McKeand, Dennis Kekas, Lynn Reese, Alex Huang, David Bird, Jim Clark, Matt Ronning, Ernest Murphrey

Public Events and Understanding

Hosted by Terri Helmlinger Ratcliff, December 11, 2007

Participants: Diane Cherry, Alice Warren, Trish Inlow, Debbie Reno, Courtney Thornton, Jud Hair, Anita Brown-Graham

Classes and Programs

Hosted by Courtney Thornton, January 3, 2008

Participants: Terri Helmlinger Ratcliff, Alice Warren Michael Mayer, Trish Inlow, Myra Moses, Rebecca Swanson, Gerry Liuginbuhl, Candace Vic-Goode, Joni Spurlin

Technical / Expert Assistance

Hosted by Jeff Debellis and Susan Jakes, January 18, 2008

Participants: Pat Sobrero, Scott Daughtery, Jon Ort, John Richardson, Gene Fornaro, Carol McLaurin, Jay Jayaratne, Stacy Tomas, Annette Dunlap, Celen Pasalar

Impact!

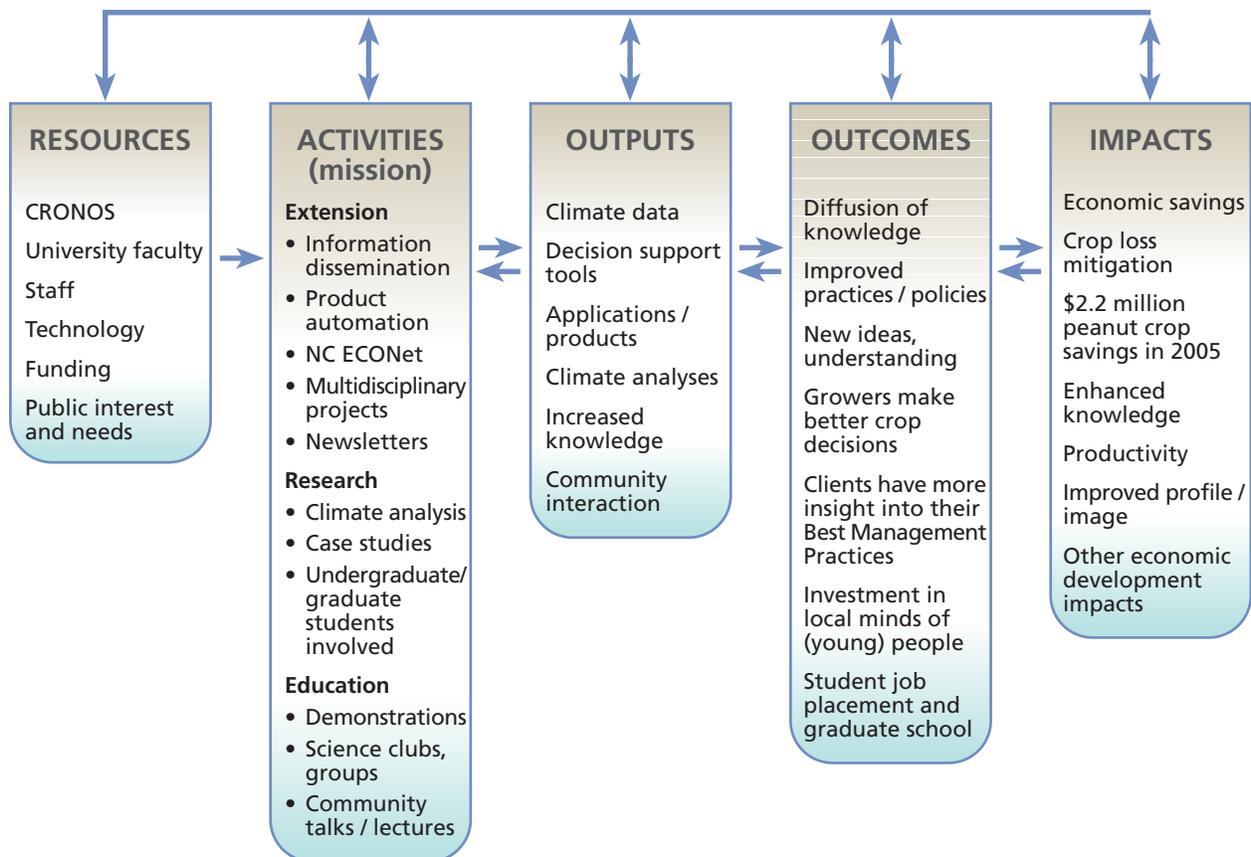
Appendix E — Logic Model for the State Climate Office of North Carolina

Technical or Expert Assistance, Public Events and Understanding, Experiential/Service Learning, and Knowledge Creation and Transfer



Mark Brooks, SCO, BEDI

NC State University



Appendix F — Surveys

Small Business & Technology Development Center Survey		page 1
<p>North Carolina SMALL BUSINESS & TECHNOLOGY DEVELOPMENT CENTER IMPACT STUDY QUESTIONNAIRE</p>	<p>ALL INFORMATION WILL BE KEPT CONFIDENTIAL</p>	
<p>1. When was your business started? Year Started _____ Never Started <input type="checkbox"/></p> <p>2. What was the major activity of your business or proposed business in 2006? <i>Please check one.</i></p> <p><input type="checkbox"/> Retailing (food, apparel, autos, etc.)</p> <p><input type="checkbox"/> Services (motel, laundry, law, etc.)</p> <p><input type="checkbox"/> Wholesale (distributor, etc.)</p> <p><input type="checkbox"/> Manufacturing</p> <p><input type="checkbox"/> Construction (all general, and other contractors)</p> <p><input type="checkbox"/> Other (please specify) _____</p> <p>3. Counting yourself, how many <u>full-time employees</u> (35 hours or more per week) and <u>part-time employees</u> (less than 35 hours per week) did you have at the end of each of the following years that you were in business? <i>If you were not in business just write N/A in the appropriate blank(s).</i></p> <p>2006 _____ full-time employees</p> <p>2007 _____ full-time employees</p> <p style="text-align: center;">EXISTING</p> <p>2006 _____ part-time employees</p> <p>2007 _____ part-time employees</p> <p>4. Please estimate the number of jobs saved as a result of the assistance received from the SBTDC.</p> <p>Existing Full-time jobs saved _____</p> <p>Existing Part-time jobs saved _____</p> <p>5. What were your gross sales revenues (i.e., before expenses) for the following calendar years? <i>If you were not in business during either year write N/A (not applicable) in the appropriate blank(s).</i></p> <p>2006 \$ _____ 2007 \$ _____</p>	<p>6. Please estimate the amount of gross sales revenues maintained as a result of the SBTDC's assistance.</p> <p>Existing revenues maintained \$ _____</p> <p>7. Did the SBTDC assist you in obtaining financing?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>8. Please estimate the total amount of debt and equity financing your business raised in 2006 and 2007.</p> <p>SBA Loans \$ _____</p> <p>Other Loans/Debt Financing \$ _____</p> <p>Equity Raised from Investors \$ _____</p> <p>9. Was the overall service you received from the SBTDC beneficial?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>10. How would you rate the knowledge and expertise of your SBTDC counselor? <i>(Please circle one).</i></p> <p>Excellent Above Average Average Below Average Poor</p> <p>11. How would you describe your overall working relationship with the SBTDC counselor who provided counseling to you? <i>(Please circle one).</i></p> <p>Excellent Above Average Average Below Average Poor</p> <p>12. Would you recommend that other businesspersons contact the SBTDC?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>13. Was comparable assistance available from a private consultant at a price you could afford?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>	

Appendix F — Surveys (continued)

Small Business & Technology Development Center Survey		page 2																																																																																																						
<p>North Carolina SMALL BUSINESS & TECHNOLOGY DEVELOPMENT CENTER IMPACT STUDY QUESTIONNAIRE</p>	<p>ALL INFORMATION WILL BE KEPT CONFIDENTIAL</p>																																																																																																							
<p>14. How many family managers (including yourself) and non-family managers does your business have?</p> <p># Family Managers _____</p> <p># Non-family Managers _____</p> <p>15. What percentage of the business do you own? What percentage does other family members own?</p> <p>% Owned by Myself _____</p> <p>% Owned by Family _____</p> <p>16. Do you wish/expect that the future successor as president of your business will be a family member?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>17. Over the last 3 years, or since start up (whichever is shorter), your firm's performance compared to competitors has been (please circle best response):</p> <p style="text-align: center;"> Much Higher Higher About the Same Lower Much Lower </p> <p>18. Over the last 3 years, or since start up (whichever is shorter), please circle the range that best estimates your firm's average yearly profitability (return on sales).</p> <p style="text-align: center;"> <0% 0% 1-5% 6-10% </p> <p style="text-align: center;"> 11-15% 16-20% >20% </p> <p>19. Over the last 3 years, or since start up (whichever is shorter), please circle the range that best estimates your firm's average yearly sales growth.</p> <p style="text-align: center;"> <0% 0% 1-5% 6-10% </p> <p style="text-align: center;"> 11-20% 21-30% >30% </p>																																																																																																							
<p>20. Please rate the importance of each of the following priorities <i>for your business</i>:</p>																																																																																																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; padding: 2px;">PRIORITIES: 1= lowest importance; 3= medium importance; 5= highest importance</th> <th style="text-align: center; padding: 2px;">1</th> <th style="text-align: center; padding: 2px;">2</th> <th style="text-align: center; padding: 2px;">3</th> <th style="text-align: center; padding: 2px;">4</th> <th style="text-align: center; padding: 2px;">5</th> </tr> </thead> <tbody> <tr><td style="padding: 2px;">Maximizing short-term cash flow.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> <tr><td style="padding: 2px;">Maximizing long-term sales growth.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> <tr><td style="padding: 2px;">Maximizing profits.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> <tr><td style="padding: 2px;">Financial security.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> <tr><td style="padding: 2px;">Building a business to pass on to my children.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> <tr><td style="padding: 2px;">Providing career opportunities in the business for members of my family.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> <tr><td style="padding: 2px;">Involving family in the business.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> <tr><td style="padding: 2px;">Maintaining family control over the business.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> <tr><td style="padding: 2px;">Investing for the long-term.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> <tr><td style="padding: 2px;">Minimizing debt.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> <tr><td style="padding: 2px;">Maximizing productivity.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> <tr><td style="padding: 2px;">Engaging in new entrepreneurial initiatives.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> <tr><td style="padding: 2px;">Achieving consensus among family members regarding the business.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> <tr><td style="padding: 2px;">Building the social status of my family through the business.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> <tr><td style="padding: 2px;">Creating wealth to pass on to my family.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> <tr><td style="padding: 2px;">Achieving harmony among family members in the business.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td><td style="text-align: center;">☐</td></tr> </tbody> </table>			PRIORITIES: 1= lowest importance; 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National Institute of Standards and Technology Manufacturing Extension Partnership Survey

page 1

Questions 1-7 will ask for "yes" and "no" responses to general questions:

1. Did the services you received lead you to:	Yes	No	Don't Know
a) Take actions that you would otherwise not have taken?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Take actions more quickly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Take actions at lower cost?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. As a direct result of services you received, has your establishment experienced any of the following changes over the past 12 months in these areas of manufacturing systems?	Yes	No	Don't Know
a) Reduce lead time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Reduced work in process inventory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Reduced defect rate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Increased inventory turns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. As a direct result of services you received, has your establishment experienced any of the following changes over the past 12 months in these areas of marketing and sales?	Yes	No	Don't Know
a) Improved understanding of customers, markets, or competitors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Improved customer development or retention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Entry into new or better markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. As a direct result of services you received, has your establishment experienced any of the following changes over the past 12 months in these areas of human resources?	Yes	No	Don't Know
a) Improved employee skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Reduced employee turnover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Improved work environment for employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. As a direct result of services you received, has your establishment experienced any of the following changes over the past 12 months in these areas of information systems?	Yes	No	Don't Know
a) Achieved greater integration with the information systems of your customers or suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Improved e-commerce capabilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Improved use or selection of information systems or software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. As a direct result of services you received, has your establishment experienced any of the following changes over the past 12 months in these areas of management systems?	Yes	No	Don't Know
a) Improved environmental management systems (e.g., ISO 14000)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Achieved quality certification (e.g., QS 9000, ISO 9000)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Improved business or strategic planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. As a direct result of services you received, has your establishment experienced any of the following changes over the past 12 months in these areas of overall performance?	Yes	No	Don't Know
a) Improved profit margin. <i>Less rework (improved quality); remove waste in production; reductions in inventory, WIP or overhead; increased inventory turns; improved employee skills; reduction in need for temporary labor; reduction in employee turnover</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Increased revenue or cash flow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Improved customer satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Increased market share	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

continued next page >

Appendix F — Surveys (continued)

National Institute of Standards and Technology Manufacturing Extension Partnership Survey	
page 2	
Questions 8-13 will ask for dollar values in sales and savings over past 12 months:	
8. Did the services you received directly lead to an increase in sales of your establishment over the past 12 months? <i>Increased production capacity; new product line; expanded market (ISO certification); improved quality; improved understanding of customer, markets or competitors</i>	How much?
	\$
9. Did the services you received directly lead you to create any jobs over the past 12 months? <i>Increased production capacity; new product lines; expanded markets (ISO certification, etc)</i>	How many?
10. Over the past 12 months, did the services you received directly lead you to retain sales that would have otherwise been lost? <i>ISO Certification required for doing business; increase capacity; improved quality; reduced lead time; improved understanding of customers; markets or competitors</i>	How much?
	\$
11. Did the services you received directly lead you to retain any jobs over the past 12 months? <i>Improved employee skills; improved work environment; retention of possible lost sales; new product line</i>	How many?
12. Did the services you received directly result in cost savings in labor, materials, energy, overhead, or other areas over what would otherwise have been spent in the past 12 months? <i>Fewer on-the-job accidents; improved quality; improved production layout; reduction in WIP; reduction in work space (lighting/heating reduction); increase in production capacity (reduction in overtime); reduction in material costs</i>	How much?
	\$
13. Over the past 12 months, were sales per employee higher than they would have been without services? <i>Reduction in employees (sales same level); increase in sales with employee # same or less (see question 8)</i>	<input type="checkbox"/> Yes
	<input type="checkbox"/> No
	<input type="checkbox"/> Don't Know

continued next page >

National Institute of Standards and Technology Manufacturing Extension Partnership Survey

page 3

Questions 14-16 will cover your establishment's investments over the past 12 months

14. As a result of the services you received, has your establishment increased its investment over the past 12 months in:	How much?
a) Plant or equipment? <i>Purchase new equipment; environmental/energy monitors; expansion of work space; energy efficient lighting; improvements in plant safety; materials and labor for modifications made to facility during project</i>	\$
b) Information systems or software? <i>Purchase: Equipment – barcode scanner technology; IT or networking equipment; computer software; programmable logic controllers; employee time tracking hardware/software; shipping software; ERP / MRP software</i>	\$
c) Workforce practices or employee skills? <i>Project cost; employee salaries involved in project; travel & hotel expenses; equipment related to changes in practices (bulletin boards, paint, shelving, etc); employee certifications</i>	\$
d) Other areas of business? <i>Changes to advertising and business supplies (ISO Certification, Six Sigma, Quality Award, reduction in lead time);</i>	\$
15. As a result of the services you received, did your establishment avoid any unnecessary investments? <i>Increased production capacity (avoidance of relocation expense, additional equipment, space and/or employees, etc); decrease or avoidance of OSHA/environmental fees; reduction in need for temporary labor; reduction in outside warehousing (trailors, etc)</i>	How much?
	\$
16. As a result of the services you received, did your establishment save on any unnecessary investments that were made? <i>Reduction in equipment rental/purchase; increase in employee retention (lower training costs); reduction of employees (less overhead, supplies, equipment, etc); reduction in need to temporary labor/OT; reduction in outside warehousing (trailors, etc); reduction/prevention of work stoppage due to emergency response.</i>	How much?
	\$

Questions 17-21 will cover overall satisfaction of services

17. Is your establishment more competitive as a result of the services you received?	Yes	No	Don't Know
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Did the services you received have any other effects on your establishment during the past 12 months? <i>If yes, describe them.</i>	Yes	No	Don't Know
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Are you satisfied with the quality of services you received?			
Very satisfied Satisfied Neutral Dissatisfied Very dissatisfied			
20. Would you use this program's services again in the future?			
Definitely would Probably would Not sure Probably would not Definitely would not			
21. What do you think will be your single biggest business challenge next year?			

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