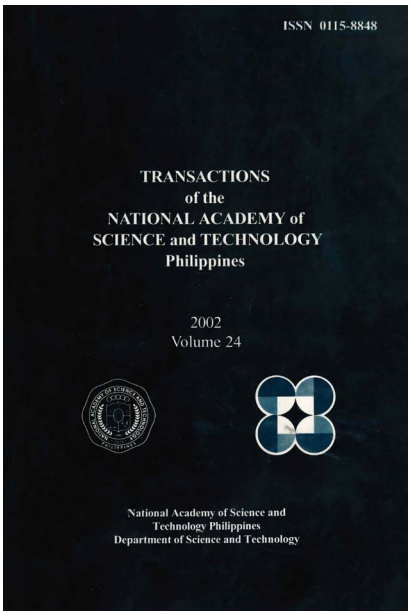
TRANSACTIONSNASTPHL
ISSN 0115-8848 (print)
ISSN 2815-2042 (online)
https://transactions.nast.ph
Vol. 24 Issue No. 2 (2002)
doi.org/10.57043/transnastphl.2002.5078

Transactions NAST PHL, is the official journal of the National Academy of Science and Technology Philippines. It has traditionally published papers presented during the Academy's Annual Scientific Meeting since 1979 to promote science-based policy discussions of and recommendations on timely and relevant national issues as part of its functions as a national science academy. Starting in 2021, this journal has been open to contributions from the global scientific community in all fields of science and technology.



Meeting Global Challenges: Research to Market through Industry Clustering, A Model for Governance

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Citation
Follosco CL. 2002. Meeting global challenges: Research to market through industry clustering, a model for governance. Transactions NAST PHL 24(2): 85-114. doi.org/10.57043/transnastphl.2002.5078

Trans. Natl. Acad. Sci. Tech. Philippines 24: 85-114 (2002).
ISSN 0115-8848

MEETING GLOBAL CHALLENGES: RESEARCH TO MARKET THROUGH INDUSTRY CLUSTERING, A MODEL FOR GOVERNANCE

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ABSTRACT

This paper analyzes factors affecting productivity and competitiveness and cites the need to leapfrog, as simple productivity techniques are no longer adequate to catch up with our competitors. A proposed alternative is to focus on certain sectors, given the meager resources, constraints and advanced state of our competitors in basic infrastructure technology, governance and even knowledge. To achieve this, clustering as a model for governance and productivity is being pursued by government, academe and private sector so as to prevent the wastage of enormous amounts of resources because of inadequate planning, poor implementation and lack of team work as was experienced in the past. Continuous improvements on the clusters are in process. For clustering to succeed, there is a need for good and dedicated leaders and champions in government, private sector and the academe who are knowledgeable about various cluster segments of sub-segments of the whole value chain from product development to marketing, including support industries and specialized cluster resources like infrastructure, technology, education, finance, taxation and regulations.

Keywords: clustering, governance, globalization, competitiveness

INTRODUCTION

The lackluster performance of our productivity efforts in government, private sector and the academe is reflected not only in our declining Philippine competitiveness ranking globally, total factor and partial productivity indicators, but also on the lack of competitiveness of many of our export and domestic products and services, especially with the liberalization of trade, technology, finance and now, people.

This paper represents an attempt at a comprehensive and updated report, study, analysis and recommendations on a topic which evolved from master plans, to total systems integration, to value chain management and then finally to industry clustering. Even the term "Industry Clustering" takes different forms in the world, in the Philippines and in different sectors. Some would only consider certain segments or sub-segments of the value chain forming a cluster. Some would only look at a cluster covering a physical or geographic area.

I am motivated and challenged in this effort of "Clustering" by my stint in various endeavors comprising major stakeholders of a cluster, now and in the past, such as in government in the Department of Trade and Industry as Undersecretary handling Regional Domestic Group (Regional operations, plus four National Bureaus), as Governor of the Board of Investment from 1986-1989, and in the Department of Science and Technology as Secretary, from 1989-92. I have also been involved in the private sector as official of various corporations, domestic and multinational (past and present) and in international and regional agencies, chambers, professional, industry and volunteer groups, etc and in academe, as a member of the Engineering and Management faculty and now as chairman of an S & T academic institution.

As founding chairman of the Philippine Productivity and Quality Movement in 1982 and having continuously been involved in Productivity Science, I have been given a greater opportunity to focus on clustering, especially now where more than 50% of my efforts are directed as my contribution to government and private sectors in its quest for competitiveness. This output-oriented work has seen me participate in 32 one-day workshops on concepts of clustering in all regions of the country, visits to countries with cluster models: US, Italy, Spain, Israel, etc., noting the various cultures of people. In addition, together with the workshops, 76 lectures, dialogues and consultations on clustering were done over the past year.

I am particularly challenged by Michael Porter, a Harvard Professor whose book: Competitiveness of Nations made studies of different countries on their competitiveness and Jeffry Sachs, another Harvard professor who presented an economic report in the middle 90s with a conclusion that R & D in the Philippines was not effective.

While the original topic suggested was "Meeting Global Competitiveness: Research to Markets," I have adopted the sub-topic: " Through Industry Clustering: A Model for Governance," in line with the thinking of management practitioners.

ANALYZING FACTORS AFFECTING PRODUCTIVITY AND COMPETITIVENESS

Since our first Productivity Conference 19 years ago conducted by the Philippine Productivity and Quality Movement, we have been benchmarking with the then four NIC'S (Taiwan, South Korea, Hong Kong and Singapore). Later, we were comparing our ranking with the so-called "baby tigers": Malaysia, Thailand, Pakistan and Indonesia. Today, we see the huge countries of China and India ahead in many economic sectors.

Over the years, we studied and evaluated Asia Productivity Organization studies on factors affecting productivity. We highlighted during our first Productivity Conference these factors that hinder productivity in the Philippines, indicated below:

A. Government

- Bureaucratic set-up that is more procedure and rule-oriented than result-oriented; many government controls causing procedural delays.
- Confusing and changing policies of government.
- Weak implementation of programs. Lack of management in government and non-industry sectors of the economy causing delays and creating frustrations all around.
- Lack of proper macro-micro linkages and lack of institutional machinery
- Indiscriminate import of technology, machinery and management practices and development models of advanced countries without looking at their relevance to our environment.
- Lack of integrated planning and coordination among sectors.
- Failure to create adequate opportunities and environment for growth.

B. Resources

- Shortage of capital and lack of internal saving propensity.
- Insufficient information about resources and inability to generate, mobilize and utilize resources.

C. Social and Cultural Values

- Traditional value system and related values for work, life, progress and group behavior; absence of team spirit, cooperation, discipline, resilience, ability to adapt, etc.

D. Infrastructure

- Poor infrastructure – power, transport, communications, education, health, research and development, etc.

E. Management

- Family-style management, trading and lending community holding the reins of industry; lack of well-trained, professional and enlightened management.
- Inadequate management development due to lack of recognition of the role of managers in developing economies; inability to overcome social, economic, and political environmental factors; lack of suitable performance evaluation system.
- Lack of innovative and participative management.
- Ineffective first line management and lack of recognition.

Reviewing this now, aren't most of these the same problems confronting us, but with greater magnitude?

COMPETITIVENESS

Similar to our productivity growth, we have been tracking yearly our World Competitiveness ranking as reflected in the World Competitiveness Yearbook published by the International Institute of Management Development (April 2002). Unfortunately, we have not improved our ranking. We were No.31 in 1997, No.32 in 1998, No.31 in 1999, No. 37 in 2000, No. 40 in 2001 and remained No.40 in 2002 out of 49 countries.

Our ranking as compared with other countries, mostly Asian, are shown in Table 1.

Table 1. World Competitiveness Scoreboard 2002

	Rankings				
Country	2002	2001	2000	1999	1998
USA	1	1	1	1	1
Finland	2	3	4	5	6
Singapore	5	2	2	2	2
Hong Kong	9	6	12	6	5
Taiwan	24	18	20	15	14
Malaysia	26	29	27	28	19
China	31	33	30	29	21
Thailand	34	38	35	36	41
Philippines	40	40	37	31	32
India	42	41	39	42	38
Indonesia	47	49	44	47	40

Source: International Institute of Management Development (April 2002).

Several Competitiveness Input Factors involving 286 criteria and grouped into the following categories are the basis of the rankings: 1, economic performance; 2, government efficiency; 3, business efficiency; and 4, infrastructure. Business, technological, scientific, health and environmental infrastructure are included in Category 4. A similar report prepared by Harvard Professor Jeffry Sachs and Michael Porter placed us from no. 37 in 2000 to no. 48 in 2001 out of 75 countries.

On the other hand, the META Group's (U.S.–based Research Group) ranking for Technological Competitiveness is based on studies of 47 countries using five technological categories: 1, Knowledge jobs; 2, Technological Innovation; 3, Degree of transformation to digital economy; 4, Economic dynamism; and 5, Globalization. The overall leader is U.S., followed by Japan, Germany, France and Finland. It is noteworthy to point out that in the first category – Knowledge jobs, the Philippines ranked first, followed by Australia, U.S., Canada and France. The sub-criteria used were: a, Qualified Engineers; b, Availability of IT Skills; c, Availability of Senior Management; and d, Higher Education Enrollment

EXPORT COMPETITIVENESS

Our export growth has shown impressive growth rates during the middle of the 90s as shown in Fig. 1. The same chart also shows total exports, less electronics, representing our traditional high value-added products. The graph for this showed an almost flat growth, indicating our expansion from the high value (higher technology) to the lower value, labor-intensive electronics sector. Unfortunately, the electronics sector dropped by 16% in 2001.

The next chart (Table 2) shows our export performance by major sectors for 2001 as 2000. Only 4 of the 15 categories showed positive growth. This year 2002 performance showed lower negative growth rates for January of 8.9%, February of 7.7%, March of 5.32% and April with positive growth of 0.4%.

INTERNATIONAL AND NATIONAL TRENDS

For the past few years, we have seen emerging trends which will continue this millennium. These are:

1. Global free trade – WTO
2. Regional free trade – AFTA, APEC, NAFTA, EU
3. Entry of low cost labor – China, India, Vietnam, etc.
4. More automation, IT
5. More awareness of quality and productivity
6. Biotechnology
7. More environmental concerns
8. Global specialization, niches for products and services
9. Labor migration

In the decade of the 50s, we were the second most competitive and progressive country (next to Japan) in Asia. The other Asian countries were learning from our scientists, engineers, economists, accountants, schools, democracy etc. Our engineers and contractors were building infrastructures like airports, roads, buildings and factories in many countries. However, we have remained uncompetitive over the years. The simple productivity techniques such as 5S, KAIZEN, TQM and others are good – but not adequate.

Our alternative is to "leapfrog" in sectors we should focus, where we have comparative advantage, considering our meager resources, constraints and the advanced state of our competitors in basic infrastructure, technology, governance and even "knowledge" under an integrated approach of planning, implementation and controls through proper benchmarking.

Programs and activities need re-orientation to achieve dramatic increases in productivity and therefore global competitiveness. At the same time, because of our poverty levels and unemployment problems, our efforts on productivity growth should be coupled with social equity – equity for the Filipino.

BEGINNINGS OF INTEGRATED APPROACH

We shall attempt to enumerate certain interventions embarked by NEDA and other agencies aimed at developing an agro-industrial economy over the past decades. From a plantation economy to a nationalistic strategy through high tariff walls, leading to an import-substitution program and now an accelerated liberalized regime, we still find our competitiveness declining. Since so much time and efforts have been spent by our macro-economists on this, discussion will be limited to the sectoral areas.

1. Commodity Focus

For decades now, we have been creating agencies or clusters for Commodities such as: sugar, coconut, rice corn, abaca, and other fibers, wood, metal, textile, cotton, to name only few. Yet, our cursory review is that all these commodities with dedicated agencies are uncompetitive, whereas banana and pineapple, which have no dedicated government agencies, are very competitive.

2. Major Projects

The eleven major projects during the Marcos Regime such as iron and steel, fertilizer, copper, diesel engine, etc. are nowhere to be found except for a few floundering companies.

3. Private Sector Projects

Holding companies dedicated to certain sectors such as mining, construction, power shipping and land development, trading, etc. have shown measures of success

except those whose coverage expanded to non-related sectors, or where the management of the enterprises have passed to second or third generations.

4. Board of Investment's (BOI) Investment Priorities Plan (IPP)

While the priority sectors, which were provided incentives encouraged investments, many were not able to sustain their development and competitiveness, like the car, truck, motorcycle, appliances, etc. manufacturing programs.

5. Regional DTI Integrated System

Having seen the problems of planning, implementation and coordination, during my stint at DTI Regional Domestic Group, I was allowed to integrate the then existing four DTI Regional offices in each region into one and create Provincial offices, using the excess manpower in 1986. The four groups of priorities were identified for each Provincial Priority Sector, as follows: 1, Industry Priorities Plan; 2, International Trade Priorities Plan (for provinces with export potential); 3, Domestic Trade Priorities Plan; and 4, Technology Priorities Plan.

In all the regions and provinces, an Institutional Development Division was created to organize NGOs like People's Economic Councils (numbering more than 1000), and strengthen chambers and industry associations, including setting up of common service facilities. Four National agencies: Bureau of Small and Medium Enterprises Development, Bureau of Domestic Trade, Bureau of Product Standards and Bureau of Consumer Protection were placed as part of the Group for better regional coordination.

6. DOST's Integrated System

We developed and implemented the Science and Technology Master Plan (STMP) at the DOST as an initial attempt to push the large number of researches in laboratories to the market, hence, the STMP had three components: (a) Commercialization and technology transfer; (b) Research and development and (c) Institutional development. In effect, it is R & D to market with strong institutional support like: Education, (ESEP, S&T Scholarships), science parks, technology incubators, financing, etc.

These were supposed to focus on the 15 leading edges identified in 1989. At that time, there was no integrated master agro-industrial plan, which could be the basis for an S&T Plan, hence, the Science Community had to develop their own priorities.

7. Private Sector Involvement in Clustering

After leaving the government in 1992, I participated in undertaking studies as a principal or resource person for the following: (1) NEDA Agro-Industrial

Restructuring Studies under UNDP; (2) Determination of priority sectors for Davao and Cebu City by the Services Group (Washington, DC, USA) under US-AID; (3) Cagayan-Iligan Corridor Cluster Studies by Agro – Industrial Consultancy, as principal consultant; and (4) Engineering and Metalworking Studies for Cebu conducted by Agro- Industrial Consultancy, as principal consultant.

In the case of Cebu, priority clusters identified were furniture and electronics. Both these two sectors require support industries in the metal industries sector, which resulted in the setting up of institutions like the Steel Center, CNC Machineering Center, Design Center and other common facilities. In Davao, priority was in agriculture commodities, principally fruits. In the Cagayan-Iligan-Corridor priority sectors identified were food (fruits) and vegetables including processing, aqua-culture, construction materials: steel, cement, wood.

8. 1994 National Export Summit

As a participant to this Summit, I proposed three major recommendations to enhance productivity and competitiveness, all of which were adopted by the Summit and approved by Government:

(1) Productivity Enhancement for Key Industry Clusters
- Systems integration
- Infrastructure
- Benchmarks
- Training
- Information technology
- Research and development
- Manpower development
- Other activities that will make the sector globally competitive

(2) Special Areas (Area Productivity Councils)
- Improvement of government services
- Managerial and technical training
- Labor and management relations

(3) Strengthening of Productivity Machinery

Unfortunately, while an Export Development Council (Networking Committee on Productivity) implemented the above program since 1994, with activities on awareness and simple productivity measures like 5S, not much productivity growth resulted.

9. 2000 Medium Term Action Agenda for Productivity

Of concern during the series of 7 Workshop in Governance, culminating during the 2000 National Productivity Summit were the following with the recommended steps to address such concerns:

a. High cost of doing business
   - Review bureaucracy reengineering and assess the impact of the Attrition Law
   - Implement public sector streamlining agenda
   - Adopt time-based/limit processing with automatic approval provision
   - Computerize frontlines services of revenue-generating/regulatory government agencies
   - Have a Bureau of Customs deputy commissioner assigned to the export industry

b. Lack of coordination, integration and economies of scale
   - Identify industry clusters and close the gaps in the supply-market-chain include education, research and development and infrastructure chain
   - Develop inter-and-intra-linkages among local industries

c. Lack of academe-industry coordination
   - Inculcate in the curriculum values, culture building program and basic Q&P improvement concepts starting from primary education

10. Inclusion of Industry Clustering as the main strategy for Export Development under the NEDA Medium-Team Development Plan (2000).

11. Washington Sycip Policy Center (AIM)

After an analysis of the Philippine Global Competitiveness based on the 2001 World Competitiveness Yearbook, the Washington Sycip Policy Center came out with a conclusion that there are three major factors that have the strongest effect on Competitiveness: Business Infrastructure, Productivity and Taxation.Policy recommendations were made to the President and Cabinet on July 2, 2001 as follows:

Business Infrastructure. Business infrastructure can be improved based on the following recommendations provided by Mr. Jaime Ayala of McKinsey & Co:

(a) Improve Philippine competitiveness through microeconomic reforms on a sector by sector basis.
(b) Focus on large domestic sectors with large potential for growth such as construction and retail.

(c) Eliminate barriers to competition in each sector.
(d) Aid informal economy in entering formal economy by improving land tenure arrangements.

Taxation. Taxation collection can be improved through the following recommendations provided by former Bureau of Internal Revenue Commissioner Atty. Liwayway Vinzons-Chato:

(a) Understand monetary and fiscal measures involved with taxation reform.
(b) Minimize conflict between efficiency and equity.
(c) Continual internal benchmarking of performance of the BIR of previous administrations.
(d) Collaborative benchmarking with other countries in the region to find and implement best practices in taxation.

Productivity can be aided by the following recommendations of this author.

(a) Government, educational institutions and related industries must act as a cluster – in effect collaborating among themselves in improving the performance of each sector.
(b) Re-engineer the government bureaucracy through the merger of certain departments and agencies; and the elimination of graft and corruption at all levels.
(c) Develop education and manpower programs for the priority clusters to generate a highly-qualified and innovative workforce.

INDUSTRY CLUSTERING

Because of enormous amounts of resources wasted in many agriculture, industry, services sectors and sub-sectors due to a major extent to our inadequate planning, poor implementation and lack of teamwork among stakeholders in our economy, the clustering concept as a collaborative model of governance has been strongly advocated. In addition to its approval in the 1994 Export Summit, the 1999 Philippine Export Development Plan mandates clustering as its main strategy. It is also included in the MNAAP 2000 as a collaborative model for productivity.

The clustering concept used in the Philippines draws heavily from studies made by Prof. Michael E. Porter in "Competitiveness of Nations," various cluster and cluster segment proponents, internationally and locally, visits to cluster models in various countries and the contributions made by government, academic, business and NGOs all over the country. All these were adapted to suit the Philippine environment, its different regions and provinces, stages of development and socio-cultural differences.

The PEDP defines industry clustering: "Grouping of firms in an industry, the allied business which support the industry through the provision of goods, services, machinery and specialized inputs (e.g. knowledge), and the buyers, all operating

under an environment shaped by government, the physical and cultural heritage, and available infrastructure." In effect, it is a grouping of firms and institutions, private, government and academic; competing and cooperating among themselves in the core activities, supplier industries and support or specialized cluster resources.

While most of the clusters are geographic in scope limited to certain cities or provinces, clustering has expanded to regions, country, regional blocs like ASEAN or APEC or even outside. The competitiveness of the final product or service is the main determinant.

An illustration of such cluster segments or stakeholders is shown in Figure 3.

This cluster model tries to achieve the following:
Collaborative model of governance

- ✓ Policy making
- ✓ Government – Industry Partnership
  To develop higher technology
- ✓ Equal Partnership
  Government with Industry
  Company to Company
  (Networking)
- ✓ Middle Sector
  Trade Association, Consortia, and Informal groups leading to global competition

Cluster specialized resources also to be reviewed are as follows: human resources (skills); technology or knowledge (education, R & D, commercialization and or extension, manufacturing); networking infrastructure (physical and social,

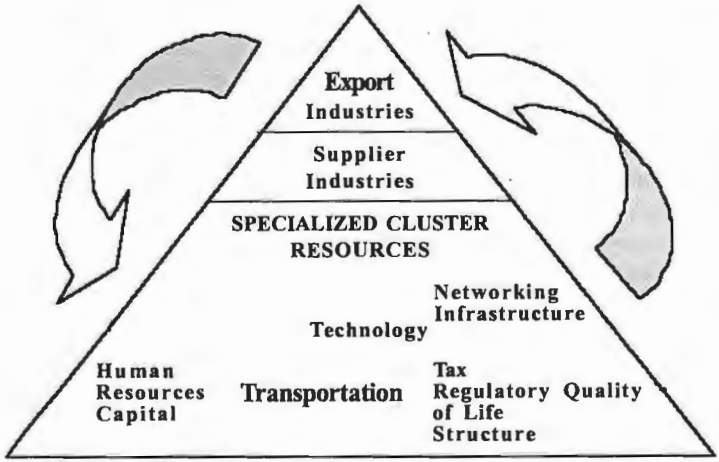

Figure 3. Model of industry clustering

marketing and distribution); capital (equity, venture, and credit); transportation; tax and regulatory structure and quality of life.

There are many modes of clustering now being applied in the Philippines, as follows: (a) Material- based (eg., wood, steel, agro, aqua, etc.); (b) Labor-based (eg., low, intermediate, high); (c) Product-based (automotive, consumer electronics, etc.) and Technology-based (Biotech, IT, etc.). Clustering can be a combination of two or more modes and may not be limited to a town or city, province, region, the Philippines or other countries in Asia or the world.

An example of clustering is given below on the coconut industry cluster subgroups and segments (Figure 4) encompassing both the agriculture and industry sectors.

A possible expansion of the diagram of the agricultural production portion into Cluster Segments and Subsegments for coconut production:

A. Research and Development

1. New varieties/hybrids for better yielding
2. Tissue culture
3. Pest control
4. Disease control

B. Nursery

Propagation of seedlings

C. Farming

1. Land preparation
2. Planting

Inter-cropping

a. Forage-livestock
b. Cassava, peanut, coffee, banana, etc.

3. Fertilization
4. Crop protection

(Pest and disease control)

5. Weeding/grass cutting
6. Harvesting

(Young or mature nuts; sap tapping)

7. Transportation

D. Support Industries

Setting up of common service facilities, such as machinery service firms, repair shops, design and manufacturing shops, etc. for above operations.

E. All of the segments indicated are applicable to our coconut varieties or hybrids. Although it is only a very small volume, varieties for ornamental

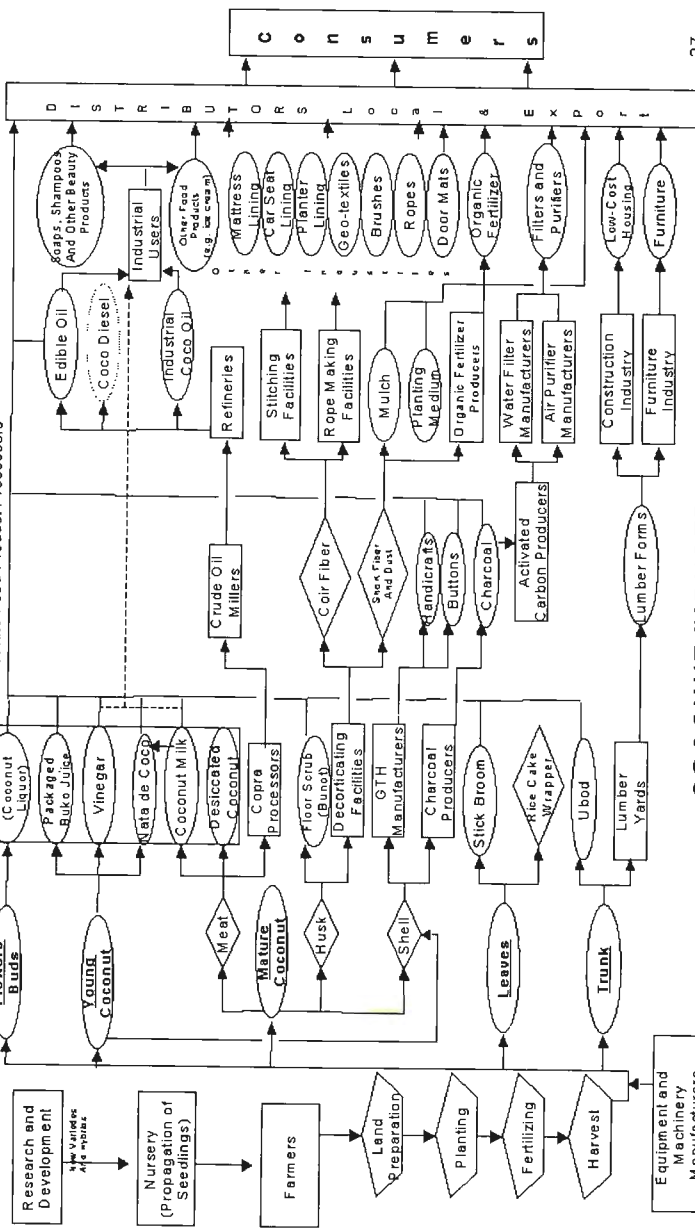

Figure 4. The coconut industry cluster

plants, such as dwarf, golden, etc, can be added. Only a few of the segments are applicable.

F. Intercropping

Managing a coconut farm requires only 4–7 man days per ha per year. At an average productivity of 0.8 tons/ha valued at P4.00/kg the farmer only makes a gross income of P3,200/ ha/year. If the owner has a contract laborer to do harvesting and copra-making, the farmer gets about 70% or P2, 240. It is therefore important that the farmer intercrops. Depending on the various soil, climatic conditions, spacing of coconuts and age, farmers have been inter-cropping coffee, banana, fruit trees, legumes, cassava, corn, herbal, perfume crops, pineapple and etc. some farmers would even have livestock production such as diary and meat cattle, carabao, deer, goat, sheep, free range chicken, etc.

CLUSTERING EFFORTS

Through the collaborative efforts of various groups, principally, EDC (Export Development Council through the National Cluster Committee), Philexport through their TAPS project, DTI, DA, DOST, DILG, CHED, TESDA, various government agencies, chambers, industry groups, academe and private sector volunteers, the clustering efforts moved at a moderate pace since 1999 and have been accelerating at a much faster rate during the last twelve months.These can be described as follows:

Phase 1 (1999-2000). Phase I consisted of workshops for DTI ROG Regional Cluster Trainers and Coordinators and echo seminars. Minimal outputs resulted in Phase 1 as the trainers and coordinators were not familiar with the various segments of the clusters in their respective regions. Furthermore there were no funds allotted for meetings among stakeholders in various provinces, including provision of experts.

Phase 2 (2000). This phase concentrated on the implementation of the Board of Investment's initial Industrial Cluster Centers. The initial clusters identified were the following: Food Center – Mariveles; IT Cluster – Gateway Industrial Park; Footwear Center – Marikina; Footwear Center – CLARK DEVELOPMENT CORPORATION (CDC); Jewelry Center – Cebu; Fish Center – Panay and Fruit Center – Davao. Unfortunately, most of the clusters failed to take off due to the following reasons: (a) Cluster was limited to a small geographic area; (b) Some clusters were broad-based, such as Mariveles which had agri-aqua, marine, grains, livestock, etc., with very limited commonality in technology, management labor skills, facilities, etc. (c) Others did not have specific strategies and programs clearly agreed by stakeholders.

Phase 3 (2001). Orientation seminars were given to interested parties; department and agency heads (separately) for DTI and DA, Congress committee

on Trade and Industry, various Productivity and Summit Conferences, and Chambers and private sector groups. These seminars tried to create awareness. The outline of topics taken up in the seminars is given in Appendix A.

Phase 4 (2001). Intensive workshops in all regions, involving various stakeholders were held in one-day sessions. After the workshops in the region, followed by Provincial Workshops, a one-day Critiquing Workshop was conducted in all regions for the region's provincial priority clusters. The outline of topics included in the workshops is in Appendix B.

Reports were submitted by all Regional and Provincial Clusters teams, containing the following: Rationale and Choice of Priority Cluster, Comparative/ Competitive edge of sector chosen; SWOT Analysis; Cluster Diagram; Impact of Cluster – GRDP, employment, etc.; Interventions; Productivity Technology Investments; and Strategies and Programs of Cluster, including timetables.

Summary of problems, issues and interventions. After the 32 Regional Workshops, followed by lectures, presentations and workshop for national agencies from the President and her Cabinet, to critical departments involved in clustering, to various government and private institutions, a summary of the problems and issues regarding clustering and recommended interventions is shown below:

1. Lack of accurate base data and benchmarks, local and international
2. How to re-orient support industries and specialized cluster resources such as infrastructure, R&D, education, etc towards the region's priority clusters.
3. Identification of investment gaps of the cluster requiring BOI / IPP and AFMA incentives.
4. Encouragement of greater LGU role in cluster development in the light of government devolution efforts.
5. Encouragement of SUCs to address the needs of region's cluster in terms of education, R&D, technology transfer.
6. Address technology gaps.
7. Strengthening institutional development mechanisms.
8. Encouraging National Chambers and industry associations, NGOs like MAP, etc. to address cluster weaknesses and gaps.
9. Spearheading potential industries, especially high-tech, not covered by region's priority cluster.
10. Assisting the more depressed provinces in its development efforts.

Priority Sectors. A summary of Product Clusters arrived at are shown below:

1. Provincial Clusters: (a) Lime, (b) Moscuvado Sugar; (c) Cassava; (d) Horticulture; (e) Corn-Feed-Livestock; (f) Cattle-Beef; (g) Fine Jewelry; (h) Fashion Accessories; (i) Handmade Paper and (j) Metalworking and Engineering

2. Multi-Regional Cluster: (a) Coconut-Based; (b) Palm Oil; (c) Rubber; (d) Coffee; (e) Fiber-Based; (f)Fruit Production and Processing ; (g) High-Value Vegetables; (h) Seaweeds and Carrageenan; (i) Meat Processing; (j) Aquamarine; (k) Furniture; and (l) Bamboo-Based.

The priority list of Provincial and multi-Regional Clusters are only the first wave of priorities, based on clustering principles and information available to stakeholders, private sector, government agencies, academe and experts. The second wave of Provincial Priorities will be developed this year by the DTI-ROG.

National Clusters. It has been noted that submissions of each province focused on existing sectors with possibilities of progressing towards competitiveness, limited initially to one cluster per province. Some provinces also opted for some of their initial choices to be National Clusters due to their inadequate expertise in the sector which can be better provided by national agencies.

On National Clusters, dialogues with DTI, BOI, EDC and DOST were conducted to include the following sectors:

a) Microelectronics – to cover Laguna, Tarlac, Cebu & Baguio;
b) IT - to cover NCR, Cebu;
c. Biotechnology – DOST and National Academy of Science and Technology to initially spearhead efforts
d) Tourism – to cover more areas
e) Machinery - which can include components and parts
f) Professional Services – to cover technical, educational medical, financial, accounting services, etc.

The National clusters developed by DTI National agencies like the BOI/IIG and the International Trade Group as follows:

a) Wearable: fashion accessories, industry jewelry, leather goods footwear, etc.
b) Home Furnishings: furniture, house wares, home decor and garden articles
c) Gift & holiday decor: boxes, picture frames, stationeries and desk accessories, souvenir items, holiday decors
d) Construction materials: marble, wood-based bamboo and other materials
e) Organic and natural products
f) Food: fresh and processed
g) Marine products: tuna, shrimp, etc. carageenan, seaweeds
h) Micro electronics
i) Motor vehicle parts and components
j) IT services

Within the DTI System, it has reorganized its priorities into ten national priorities, divided into two groups each headed by an Undersecretary with a cluster or Brand Manager and a multi-functional team assigned to oversee each cluster. The efforts of the Regional and Provincial clusters in terms of cluster development programs are now being implement and/or refined further. On the other hand, national Brand Managers and their teams are being integrated into the cluster system, starting with a clustering orientation seminar last April 2002, which will be followed by an alignment of the national and regional/provincial programs. On the part of the BOI, clustering for the regional priorities is part of the Investment Priority Plan.In addition, inclusion of SMEs under the IPP Clustering has been done starting 2002, subject to the finalization of guidelines to be adopted by the Small and Medium Enterprise Development Council (SMEDC).

DA Priorities. Several orientation seminars were conducted for all NAFC Regional Directors at DA, as well as separate meetings held with the DA Secretary, Undersecretaries and other offices. In addition, a paper on making the Coconut Industry Competitive was presented during the plenary session of the 1st Coconut Congress in Davao City on Oct. 18, 2001. Some major priorities of DA, like rice, corn, sugar, coconut, etc. are covered by separate programs, which are also under review by the Department and its stakeholders. It has been proposed that the corn cluster be expanded to corn-feed-livestock-processed meat cluster, principally for Bukidnon and Region 2.

In addition, DA has come up with an initial list comprising the following:

Banana-Lacatan, Saba
Calamansi
Durian
Cutflowers
Papaya
Mango
Tilapia
Hog
Poultry
Layer
Broiler

Strategic plans and programs for each are now being reviewed by an oversight committee, especially with regards to: (a) Contribution of the priority sector to economic development, present or potential, compared to other commodities; and (b) Issue on the competitiveness of local corn vs imported corn as inputs to the hog and poultry industry. With the phasing out later of quantitative restrictions on agricultural products, this becomes a public policy issue between farmers and consumers as a whole.

AFMA components mirrors the various cluster segments of the agricultural sector. For this reason, DA is working towards recruitment of private sector volunteers for the various commodities, functions and geographic areas.

DOST Cluster Efforts. Orientation Seminars on Clustering were conducted separately for all Regional Directors and members of the Management Committee composed of the Secretary, Undersecretaries, and Directors of national agencies. These were followed by two planning workshops participated by the author conducted in Metro Manila and followed by a series of consultation with Regional offices and relevant Research and Development Institutes in Tagaytay and Iloilo.

DOST's priorities shortlisted from previously identified from the initial Provincial and Regional lists are as follows: (a) food processing; (b) furniture; (c) fashion accessories, GTH, handicrafts, natural fibers and dyes; (d) marine and aquatic resources and (e) horticulture.

The Small Enterprise Technology Upgrading Program (SET-UP) calls for: (a) a nationwide program designed to upgrade productivity of Small and Medium Enterprise (SME) through technology application/upgrading; (b) Enterprises in the regions/provinces, whether in the agricultural, manufacturing or service sector, will be provided technology upgrading assistance and services in an integrated manner.

Its features are:

(a) Niching and clustering strategy to be used in identifying and selecting program beneficiries
(b) Priority to be given to the sectors or clusters already identified by other government agencies such as DTI, DA or LGU's which has significant potential to benefit from technology
(c) DOST to pioneer a new areas not yet being given attention but with big potential to be developed as enterprise sectors, e.g. biotechnology
(d) Various types of S&T services, technology acquisition, technology training, process and equipment design, packaging, productivity improvement, quality assurance, standardization, etc. to be given to the sectors/clusters identified
(e) Institutional partners in the regions to be tapped to enhance capabilities and to expand capacity to render services/assistance
(f) Private sector to be tapped in providing needed inputs, expertise and services, e.g., machine and equipment fabricators/manufactures/ suppliers
(g) Existing tie-ups for enterprise financing to be strengthened and reactivated and new tie-ups to be initiated
(h) Clear targets, i.e., number firms, number of trainees, productivity improvement levels, new enterprises created, business expansion, new employment generated, etc. to be set
(i) Performance to be monitored based on targets
(j) Sector mangers within the DOST system to be designated

Commission on Higher Education (CHED). In addition to the meetings and workshops on Clustering attended by University and College presidents in various regions and a meeting with the Chairperson of CHED (Dr. Ester Garcia), the following consensus was arrived at:

(a) Tapping of SUCs and private schools under CHED supervision for upgrading of quality of education, offering of more extension activities and more relevant R&D addressing
cluster gaps
(b) Channeling of resources, scholarships to region's priority sectors.
(c) Developing new programs and courses in support of clusters
(d) Developing non-traditional clusters, especially, in the area of new technologies
(e) Undertaking support programs such as science parks, business incubations, etc.

TESDA Action Plans. TESDA (an agency of the Department of Labor and Employment) which has been consistent in attending all the Regional Clustering Workshops all over the country last year has adopted the priorities chosen and expanded its focus to the overseas market for our workers.

TESDA's complete list is as follows: (a) Agriculture and Fishery; (b) Processed Food and Beverage; (c) Tourism (including Hotel and Restaurant); (d) Decorative Crafts – Gifts, Toys and Housewares, Jewelry and Ceramics; (e) Metals and Engineering; (f) Furniture and Fixture; (g) Garments; (h) Construction; (i) Communications/Information Technology/Electronics; (j) Maritime; (k) Health, Social and other Community Development Services; (l) Automotive; (m) Land Transport; and (n) Heating Ventilation and Airconditioning -Refrigeration

Private Sector Groups. Private sector groups, principally Philexport which has financially supported the conduct of the 32 Regional Workshop last year, have been very active in the clustering efforts. Their affiliates and members were also recipients of lectures and dialogues in various regions.

Lectures were conducted with various groups such as Management Association of the Philippines whose members are now serving as volunteer advisers to various government departments. In fact, MAP has launched a "GOOD NEWS" PROJECT publishing positive news and launched April 29, 2002 with "Clustering: A New Model for Governance" as the first feature of the Project. Other NGOs benefiting from this new concept and promising assistance are: Philippine Quality and Productivity Movement, Philippine Institute of Industrial Engineers, Rotary Clubs, Jaycee Senate, Entrepinoy Volunteers Foundation, etc.

FIRM LEVEL CLUSTERS

Hand in hand with the sector cluster programs, firm level clusters should be strengthened. We have previously pointed out the many private sector firms, which

have shown success except those, which expanded to non-related sectors, especially when governance is poor.

On a firm level, the total Cluster may be divided into segments as follows:

(1) Product development
  (a) Research
  (b) Development and design
(2) Supply Chain
  (a) Raw material supply;
  (b) Manufacturing/processing
  (c) Assembly
(3) Marketing and Distribution
  (a) Sales (wholesale, retail, export)
  (b) Advertising and sales promotion
  (c) Market and marketing research
  (d) Warehousing
  (e) Physical distribution
  (f) After-sales service
(4) Financing and Credit
  (a) Finance
  (b) Credit
  (c) Collection
(5) Other Specialized Service
  (a) Administration
  (b) Accounting
  (c) Industrial relations
  (d) Legal

The above segmentation is not exhaustive and can be compressed or expanded, depending on the situation.

Each of the major chains: Product Development, Supply, Marketing and Financing should be properly coordinated within the segment while the cluster team coordinates the various chains. In some cases, Product Development is a part of the Supply Chain, as suppliers of parts, components, assemblies or modules, especially proprietary in character, take it as their responsibility.

The marketing and distribution chain has now taken different forms. Independent firms now exist covering all aspects of the chain. The company-owned total sales and marketing setup is fast being segmented at reduced costs or more value-added to the company handling the products. Supply Chain Management (SCM) since the 90s has emerged as one of the methods in increasing the productivity of the supply chain. One of its concepts is that group of companies (supply chains) compete; not only individual companies; with buyers and suppliers in strong supply chains forming strategic alliances, either vertically or horizontally.

ASSISTANCE FROM OTHER INTERNATIONAL GROUPS

We are happy that the concept of clustering as a model of governance has also been given attention by other groups. To mention a few:

(1) US-AID, through Philexport's TAPS Project, part of the Phase 4 interventions.

(2) Sixteen Cluster Team members from Region 10 after almost one month of benchmarking studies on various cluster segments and subsegments with Good Practices in Australia, revision or updating of their previous cluster program has been done and was presented for critiquing on June 7 at Cagayan. The Project was funded by the Government of Australia.

(3) A team of ILO (Employment Sector) experts from Geneva requested for a briefing on our cluster priorities for a project they intend to undertake in Asia, including the Philippines.

(4) The ASEAN Secretariat is undertaking through McKinsey & Co. an ASEAN project with Philippines, Thailand and Indonesia participating. We discussed with them priority needs of a few clusters where we lack expertise such as ICT, Microelectronics and Biotechnology.

GOVERNMENT'S FURTHER ACTIVITIES

Based on the initial submissions of the DTI, Provincial & Regional Cluster Teams, DTI National Cluster Teams and the DA, a lot of time for review and evaluation of the Master Plans are being undertaken, followed by a realignment of the programs of each agency, including DOST, DOT, CHED, TESDA, etc. This will include grant of incentives for priority clusters, infrastructure, education, R&D, etc.

We are indeed very gratified with our meetings with various national government agencies, starting with the President and the Cabinet on July 2, 2001, who expressed endorsement for the Clustering Strategy as workable; and separate meetings with the Cabinet Secretaries, Staff, Regional Directors, Industry leaders, etc. All agencies are in varying degrees of Cluster Development, with the Industry sector as more advanced due to submission of Provincial Cluster Strategies and Programs and Monitoring System and reorganizing the department along the cluster management approach officially designating Managers and Champions for each Industry Sector.

A report was made by this author to the President, and the total membership of the Export Development Council composed of cabinet members and private export sector leaders in Malacañang, on June 10, 2002. The council and the President at that meeting approved the Philippines Export Development Program and the Clustering Strategy.

While at the outset, we wanted to start with LGUs (Local Government Units) as we did in the initial pilot models of clustering under the Area Productivity Councils of EDC, we found it not feasible in a great majority of provinces due to

the politicians' need for survival or vote-getting rationale for their projects. As soon as the cluster priority programs show measures of success in terms of GVA, employment, income to province and stakeholders, LGUs will become economic development-oriented, shifting the program to them would be an easier task and should be the proper approach.

Further actions proposed on clustering are:

- Establishment of a mechanism for coordination, monitoring and information sharing – Administrative Machinery
- Sustained efforts to fast track full adoption/implementation of the program including productivity benchmarking by all concerned
- Increased involvement of DILG and LGUs and other departments and agencies in the clustering efforts
- Delineation of responsibilities caused by overlaps and gaps among sectors and subsectors identified under DTI, DA, DOST, SUCs, etc.
- Creation of pool of resource persons and "Champions"
- Financial support for Total Clustering Efforts
- Continuously address cluster needs

MANAGEMENT OF THE CLUSTER

We can see simple clusters like coconut which have metamorphosed into very complex clusters, divided into segments, subsegments, etc. Many sectors are now more complex as we have in this Electronic Age. An example of this is the Microelectronics and ICT, segments of which are part of niches of excellence, forming clusters of their own.

The old concept of an integrator of a cluster or sub-cluster; or an assembler of a vehicle no longer decides the ultimate product, as even product component or network design are dictated in many cases, by firms specialized in such activities. In the electronic sector, we now see the shift by some of the progressive firms from the assembly (labor only contracting) stage to the initial stages of Product Development. Some Filipino firms even have subsidiaries on Product Design in the Silicon Valley.

The increasing complexity of our economy, its agricultural, industrial and services sectors and its subsectors require the strengthening of our total management or cluster management approach, thus, segmentation of the clusters into manageable and productive activities. This serious problem is very evident in my many lectures on various commodity, product or services. Let me just cite a few examples:

(1) Bureaucracy: Compared to other countries, our bureaucracy is bloated. Nobody seems to disagree that it is not. In many levels, salary rates are now higher than the private sector, but the quality of services is wanting.

Evidences of these are very visible: peace and order, including kidnapping and insurgency, criminality, etc. drugs, garbage collection, pollution, traffic discipline, quality of education, justice, etc, etc.In a lot of cases, we have one or more dedicated agencies for each problem.

(2) Competitiveness of our agriculture, industry and services. In agriculture, we can only show banana and pineapple and to a certain extent mango and seaweed to be globally competitive.

All the rest are not competitive such as: rice, corn, sugar, coconut, livestock, fiber, cotton, forest products, rubber, etc.

In industry, we can cite Microelectronics and ICT and a few other niches. Many of our sectors are not competitive like metals and engineering, textiles, footwear, etc. It is ironic that many of these uncompetitive industries have government agencies dedicated to promote the sector whereas the few competitive sectors have no agencies created. In the private sector, we have seen the collapse of so many industries, which have not been able to sustain the development and growth of their sector like the mining, wood, steel, automotive, machinery, construction, textile, agriculture and many others. We have also seen many conglomerates and family corporations that rose rapidly but contracted also fast, some after the founder's departure. Many of the causes attributed to these failures are lack of focus, and government problems that include improper planning and poor implementation of programs.

In many areas we are very good at clustering, like Manpower Export, entertainment (singing and dancing). If I may add: you may wish to evaluate how clustered are: politics, drugs, kidnapping, gambling, terrorism, smuggling, etc, all operating under a network system.

RE – DIRECTIONS

After 19 years of deep involvement in the Philippine Quality and Productivity and Productivity Movement, Government, Academe, Profession, business and still involved now, let me suggest a few areas for all of us to focus:

Clustering. This has been previously discussed. All sectors should be involved, working as a team; otherwise we will not be able to catch up with global competition. Coordination efforts at all levels are important – municipal, provincial, regional and national levels, department and inter-department levels.There is a need to recruit or assign experts along product, commodity or service clusters or functional areas such as: Technology, Production, Marketing, Financing, Packaging, Fiscal and Incentive matters, Infrastructure, SME's, etc. Clustering to succeed must look at the other critical problems we have been facing such as :

(1) Government Bureaucracy

Our fiscal deficits, poor government services, overlapping of functions, graft and corruption are indicators of a poor bureaucracy, which has become politicized

over the years. We like to split offices, create new ones, create committees, councils and superstructures that confuse the client the citizen.

The private sector is also following the number of layers in its organizations. The 1999 NAAP workshop on Governance has analyzed that our increasing high cost of doing business is attributed to a large extent, to the bureaucracy. This requires streamlining, improving qualification and remuneration standards and the promotion of integrity and productivity in governance. All aspects of the Bureaucracy if effected towards this goal will result in P billions of pesos in savings that will pay competitive salaries and attract the best and the brightest, not Political Protegees. Re-engineering will include abolition or merger of departments, agencies, schools, etc.

(2) Reduce the cost of doing business and eliminate graft and corruption in all levels and sectors.

Re-orient our people on the basics of Productivity. Perhaps the old definitions of productivity should now be supplanted with a more appropriate one by the World Academy of Productivity Science:

"Productivity is more than a science, technology or management techniques, being also a philosophy and an attitude of the mind that rests on the motivation of people to constantly strive towards quality and competition."

Corporate Governance. For sometime now, our economic managers have been too engrossed with that portion of our economy involving the macro-economic aspects. On the other hand, our micro-level or even sectoral level economists are seldom concerned with macro-level economies. The various stages of our economy, from an agricultural economy to import substitution, to export-level and market economy have shown the need for very close macro-micro linkages. The tremendous waste in resources arising from lack of global competitiveness of many of our economic sectors was demonstrated by our performance during the East Asian Financial Crisis starting 1997 and aggravated now that our main export destination, US & Japan, have low growth. Even as we realize the importance of public sector governance, we now realize the need to improve our corporate/private sector governance.

Investing in Human Capital. Over the years, we have lost much of our comparative and competitive edge in the global market, such as abundance of natural resources, cheap power, high literacy rates, etc. What seem remaining are:

(1) Design and artistic inclination due to in-born creativity.
(2) Skills that are easy to develop: technical, professional or managerial.

Other countries are now striving for better quality "knowledge workers." If we are to move forward, we should be investing heavily in basic education, skill training, university through academic training and research and development and

life-long learning through continuing education program and open universities. For the priority clusters, massive education and manpower development programs leading to highly qualified, motivated, hardworking and entrepreneurial/innovative work force. The best of our schools UP, Ateneo and DSLU are not even in the top 30 of the list in Asia.

Innovation and Technology are very important drivers of economic growth. They increase value, productivity and contribute to global competitiveness. Technology allows countries and companies to leap-frog. The examples of the industrialized countries have shown this. The barriers to change, however, are tremendous. Market economy through trade liberalization and deregulation, which foster competition, accelerates the technology change. Government should foster an environment of innovation and activity – supporting quality research and development and technology transfer, on a more focused basis for the Philippines can excel. On education, especially science and engineering, we have seen the deterioration of our science and engineering education as shown by our performance in Board Exams and the failure in the late 80s of the best of our engineering schools to pass the "downgraded" minimum standards of the DECS' TPEE. Against all odds, DOST was able to push very hard the 1991 ESEP focusing on a few public and private schools as "centers of excellence." I am disappointed to learn that the 5-year program ending 1997 was not continued by the DOST by bigger programs to sustain our science and technology education momentum. APEC member countries have now started to accredit engineers in APEC, although the Philippines has being singled out as basically inadequate in many aspects, not only in the total number of years our students stay in school, but also inadequacies in faculty, facilities for laboratory and research, etc. We hope government must place more attention to better quality not more schools. We must commit to develop people as business goals, plan how skills are to be developed and act to develop such skills. The key to long-term success of a company, or a country is the ability to learn better and quicker than competition. Individuals, primarily scientist and engineer, become "knowledge workers" continuously learning on how to learn.

Our cultural and social values need more attention. It is imperative for Filipinos, like many Asians, to have the following desirable traits if the country is to take a giant step towards realizing a sustained economic growth.

- ✓ Hard work
- ✓ Entrepreneurial spirit
- ✓ Ability to save
- ✓ Proper skills
- ✓ Teamwork
- ✓ Discipline
- ✓ Sense of belonging to family, company, community and country

Social and cultural values are very important factors, as they pervade everywhere. But these too change over time and with technology use. Even at a

given time, values could be different in different regions of the country and even between urban and rural areas. Studies reveal that attitudes and social values have a great bearing on productivity improvement. Further they show that:

(1) The traditional systems and values do change with greater application of technology; and
(2) The countries that have become development-oriented in their social values are under increasing pressure to upgrade their economic performance and to institutionalized their social changes through education and mass communication media.

Time limitations prevent me from further discussing our only most important competitive edge – our human resources. It is our only weapon to win the much faster race for global competitiveness for our country.

ROLE OF NAST AND ITS PARTNERS

The Academy, being the reservoir of the country's top-ranking scientists in various fields of endeavor, should exercise its influence and direct its efforts in accelerating the country's move towards greater global competitiveness coupled with equity for the Filipino. With the rapid pace of S&T changes, the country cannot afford to remain where we are. Hence, NAST's efforts should be aggressively directed towards:

1. Adopting the clustering approach for NAST's activities, integrating meaningful contributions for each our Divisions towards focussed goals. Towards this end, there is a need to look at re-engineering our systems and influencing other groups to adopt it.
2. Take on a leadership role as part of the DOST System in promoting identified priority clusters:
   a) Biotechnology
   b) Micro-electronics
   c) ICT
   d) Engineering Services
   e) Health Care Services
   f) Certain functional areas like Product Development, Packaging, etc.
3. Take on the task of studying, evaluating and recommending actions on why so much of our socio-cultural values hinder productivity and competitiveness in the Philippines. More bluntly, why do we as individual scientists excel, but not as a group?

Finally, we need good and dedicated leaders and champions, both in government, private sector and the academe who will familiarize themselves with various cluster segments or subsegments of the whole value chain from Product

Development to marketing, including support industries and specialized cluster resources like infrastructure, education, finance, taxation and regulations, etc.

The problems are ours to solve and act, not just talk about. As good S & T Practitioners we can do it. We must do it!

References:

International Institute of Management Development. 2002.
World Competitiveness Yearbook. April 2002.
Tradeline Phils Export Development Council. 2002.

Appendix A. Outline of Clustering Seminar

1. Introduction
2. PEDP Thrusts
   Definition
   1994 Export Summit Recommendations
3. Global Environment
   International Trends
   Frontiers
4. Philippine Competitiveness
   E-Economy
5. Export Performances
6. Studies on Competitiveness of Nations
   (Porter's, etc.)
7. Clustering Principles
8. Productivity Concepts
9. Clustering Practices

Appendix B. Outline of Workshop on Clustering

1. Review of Potential Target Industries
   a. Existing
   b. New
2. Choice of Priority Sectors, considering comparative and competitive advantages.
   a. National
   b. Regional
   c. Provincial Municipal
3. Cluster all-important segments of activities forming a cluster, considering immediate, medium- and long-term programs.
4. Re-engineer the cluster thro' value chain analysis of each segment.
   a. Eliminate activities that are not necessary, especially transportation
   b. Improve productivity of remaining segments
   c. Fill up gaps in the value chain through investment promotions.

5. Prepare strategies and programs setting benchmark and implement.
6. Periodically assess, modify where necessary.

TOTAL COLLABORATIVE IS IMPORTANT FOR ALL CONCERNED GOVERNMENT AGENCIES AND PRIVATE SECTOR

Appendix C. Acronyms Used

APEC	–	Asia Pacific Economic Cooperation
AFMA	–	Agriculture and Fisheries Modernization Act
AFTA	–	ASEAN Free Trade Area
ASM	–	Annual Scientific Meeting
BCP	–	Bureau of Consumer Protection
BDT	–	Bureau of Domestic Trade
BOI	–	Board of Investments
BPS	–	Bureau of Product Standards
CHED	–	Commission on Higher Education
DA	–	Department of Agriculture
DILG	–	Department of Interior and Local Government
DOST	–	Department of Science and Technology
DOT	–	Department of Tourism
DTI	–	Department of Trade and Industry
DTPP	–	Domestic Trade Priorities Plan
EDC	–	Export Development Council
ESEP	–	Engineering and Science Education Program
EU	–	European Union
GRDP	–	Gross Regional Domestic Product
ICT	–	Information and Computer Technologies
ILO	–	International Labor Organization
IPP	–	Investment Priorities Plan
ITPP	–	International Trade Priorities Plan
IIMD	–	International Institute of Management Development
LGUs	–	Local Government Units
MAP	–	Management Association of the Philippines
NAAP	–	National Action Agenda for Productivity
NAFC	–	National Agriculture and Fisheries Council
NAST	–	National Academy of Science and Technology
NAFTA	–	North American Free Trade Agreement
NGO	–	Non-Government Organization
SCM	–	Supply Chain Management
SET-UP	–	Small Enterprise Technology Upgrading Program
SMED	–	Small and Medium Enterprise Development
STMP	–	Science and Technology Master Plan
SUPRE-GOV	–	Technology Support for E-Governance