

DA, DOST, CHED, TESDA, etc.

Continuous improvements for the clusters are in process. For clustering to succeed, we must have good and dedicated leaders and champions in government, private sector and the academe who are knowledgeable about various cluster segments or 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, etc.

Keywords: industry clustering, Philippine competitiveness, governance

MAKING PHILIPPINE BIOTECHNOLOGY COMPETITIVE

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Biotechnology-based industries or bioindustries, with annual growth of up to 20% and higher, are one of the fastest growing industry sectors worldwide. Bioindustry includes companies involved in the R & D and manufacture of materials such as cell cultures, catalysts, genetic materials, immune response materials, biochemicals, enzymes, proteins and equipment used in biological and genetic research on humans, plants and animals. It also includes service organizations that perform consulting, testing and processing and storage of such products. This paper aims to analyze the rise of bioindustry in selected European and developing countries, briefly review the status of biotechnology and bioindustry in the Philippines and discuss possible strategies to spur the development of bioindustry in the country.

The United States leads in bioindustries generating US\$20 billion in revenues and 437,000 jobs in 1999. UK and Germany hold the second and third spots. The following were noted to have contributed significantly to the development of bioindustries in Europe: (a) strong life science research in Universities and strong research partnerships and collaboration between and among universities and industry; (b) enabling policies by national and regional governments such as laws that provide huge financial grants to projects, establishment of bioparks or bioincubators, support start-ups, encourage academics to be entrepreneurs; (c) strategies such as clustering or networking especially at the regional level and (d) strong biotechnology industry organizations. Governments of Asian countries like Japan, China, India, Singapore and Taiwan are cited to have provided enormous

financial support to the development of biotechnology R & D and bioindustries.

While biotechnology was institutionalized in the country two decades ago, bioindustry is still largely undeveloped. Among biotechnologies developed locally, plant tissue culture of orchids and banana can be considered the most widely utilized at the commercial level. Others such as biopesticides, biofertilizers, industrial enzymes, amino acid production, vaccine production have not taken off for several reasons: lack of industry-academe partnerships/interactions; lack of facilities and support capital for piloting technologies; lack of IPR awareness and support.

To help spur the development of biotechnology in the country, the following recommendations are offered: (a) adoption of clustering management for R & D and commercialization at the regional and national levels; (b) establish an enabling environment that will provide financial support to selected projects up to commercialization, provide infrastructure and support facilities such as a biopark, provide incentives for start-up and venture companies, and encourage scientists and business management experts to go into bioindustries and develop intellectual property (IP) culture and innovation among scientists; and (c) careful selection and prioritization of local and foreign mature technologies for commercialization and R & D projects that have potential commercial outputs.

Keywords: biotechnology, bioindustry, cluster network, cluster management, biopark, bioincubator