

P-Graph Approach for the Optimal Allocation of Human Resources to Economic Sectors in Crisis Conditions

Topic: Input-Output Analysis of Desasters

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The impact of disasters manifests not only in the destruction of infrastructure and ecological resources but also in the form of human casualties. Economic losses resulting from disasters create ripple effects throughout the economy by virtue of the interdependencies between economic sectors -- and human resources will play a vital role in rebuilding the economy. The need to attend to the victims of disasters for example will require a large supply of trained medical and healthcare service providers. Post-disaster rebuilding efforts on the other hand, need a good technical project workforce. However, since humans are not immune to the impact of disasters, inoperabilities within the workforce will also occur during crisis conditions. P-graph is a graph theoretic methodology for the synthesis of networks; current applications have been restricted to process engineering applications such as chemical reaction mechanisms, process plant design and supply chain optimization. In this work we propose an extension of the P-graph methodology for economic systems. The input-output structure of the economy is represented into a P-graph model for optimizing the allocation of human resources between economic sectors in consideration of worker skill and expertise. A case study using the input-output tables of the Philippines will be utilized to demonstrate the capabilities of the model.