

# **Economic and social systems in supply chain management: Analysis on the study of facility location of using GIS decisions**

## **Abstract:**

Decision-making is the most important part about the location of facilities and the supply chain for goods and materials effectively and efficiently are essential. Engineers and Planners in case of an ATV with facility location decisions and the fact that decision-making on transport often at short notice not make changes at the facility or not. Traditionally justice assessment in identification of centralized distribution of the population is protected. Quantitative comparison of supply chain facilities and its location on the protection of the population decisions that have been reported in the literature. The aim of this study was to develop a multi-dimensional framework of objectives for integrating social and economic impact on the decisions the facility is in place to protect the population. Integrated with the geographical conditions of the various social and economic factors Information systems to determine the level of impact on the supply chain facility location done to protect the population. Case study was conducted to evaluate the development method.

**Keywords:** environmental justice, context sensitive solutions. Socio-economic factors; low-income communities; decisions about facility location, facility supply chain.

## **1. Introduction**

As with any other type of business investment, location is considered in the success of a crisis the facility also services provided regardless of a crisis. Standards of living environment used to create Facilities may not be successful which considerably depending on the type of service, location and specialization is different. This is in spite of the fact that facilities should be built in the right places so effectively served the citizens of the course to obtain such the place can be very problematic. Research on issues related to the space facilities this model developed the formulation, formulation and helps solve various problems. Location problem may be related to the use of both mathematical optimization as well as methods of exploration. Given the size and complexity of mathematical optimization problems, heuristic techniques may be of a practical solution based on providing a practical matter in this paper, we make decisions about the location of facilities and protection of populations through environmental justice (EJ) and analysis of geographic information systems (GIS) are considered. This research aims to

develop a framework to locate some good facilities and access to low-income areas where protection of the population is not correct, is provided. The development of this framework or structure need to collect all the data and relevant issues.

Algorithms in process, efficient solution for working with GIS maps Is. GIS capabilities as a proven tool for supply chain and logistics support for managers and planners are. Location and Optimization Center Selected features are based on supply and demand. GIS methods used to align the highway. Optimization model (models and) to locate the highway optimized based on social and economic constraints on the highway are presented. (Davis, 2006; Davis and Jha, 2009).

## **2 Literature review**

Development, supply chain management (SCM) management and operating guide Demand factors such as globalization of trade, reducing barriers to imports, leveraging technology and environmental concerns have been done. These factors require constant coordination with industry changing and flexible, reliable and low-cost SCM In a very daunting effective design. The work by (Slack et al., 1995; De Toni, 2001 Et al., 2001) has been made. Extensive research has shown that analyzes the categories of decisions about the location of facilities can also be worrisome to anyone that some of these categories are (A) at least minimizing costs, (b) providing demand-driven model, (iii) growth and increase profit or (d) the reduction of environmental concerns. Hangez Han burg and eight of his colleagues in the year 2007 AD, more than Common criteria used.

Although any decision in relation to the facilities analyzed on an individual basis to determine an exact location for the facility is the need to evaluate multiple targets in it. The use of multi-objective analysis is required and can well be cited in the literature. In this study (Sweeny, Tatham, 1976; Garvin, 1997) on minimizing costs focus. Researchers to analyze this AIMS, including the availability of transport facilities and the cost is low have suggested various criteria. Transportation, labor, cost of living, availability of adding raw materials, competitive position, income and population trends, the availability of land, proximity to other industries, political influence factors related to the social, environmental considerations and risk assessment and efficiency, the criteria are that (KO, 2005; Balcik and Beamon, 2008) than they used to. Techniques used to study the distribution center managers to assess express their opinions about places dispatcher. Reading about the different places and the facilities have been developed in which the shows Population-based questionnaire results and make decisions about transport, market environment, location and cost of land property were announced. The results show that the impact of these factors on the consistent alive tees offered location which

is very important. Decisions and population characteristics of the area to consider are the distance and time, service levels, inventory. Ferreira (2005), a multi-dimensional model of targets to evaluate the proposed terminal location. To minimize costs the method that was used was allocated for the benefit of all stakeholders. We will review and Understanding individual behavior and strategic Yi each of the stakeholders involved in decisions terminal here. This restriction includes the use of the land. Is now possible to gauge the transport network, financial stability, cost and environmental impact assessment of its user terminal.

Despite this success, another multi-dimensional analysis of targets in decision-making facility location, exists. There are many ways undetected because of the uncertainty, many companies still have not been used (Snyder, 2006). In addition, the approach using multi-objective analysis of the such trade-offs production (trade without production) where the rival goal is a single approach and its purpose is not sufficient just to minimize costs (Nozick and Turnquist, 2001; Daskin et al., 2005; Klose and Drexl, 2005; Yapicioglu and colleagues, 2007). Previous work by author (Davis and Jha, 2009) is considered a multi-objective approach to create a solution despite all the design constraints of social and economic ends. The purpose of this solution trying to quantify the effects of highway construction projects to protect the population. The genetic algorithm with GIS model which is used to build the highway to protect sensitive population. Providing results to support efforts Select the type of trade-offs on the highway using census data that represent the social and economic changes, combined with the data presented simultaneously in a topography of the highway happens that definitely need to assess the balance between EJ central decisions has it. In other words, the projects in which the population is protected. The aim of this paper focuses on integration Population in a multi-dimensional analysis of targets In relation to the facilities to protect the population.

### **3 Analysis protection population**

EJ concept Is whether a project (such as a new road or transit system) the negative effects of a disadvantaged community or population size to the positive effect determines whether or not or whether Value of The society brings to the community or population or not. Most of the basics of EJ are completely wrong. Although the current management policy Doctors and Heads EJ needs to be done *to* assess However, there is no national policy and standards that provide guidance about how to do it. The analysis, however, is legally required and must be implemented. According to the (Environmental Protection Agency, 1998) should be fundamental in planning the transport system. Most questions have to EJ Far

there have been retrospective in nature. Typically, a researcher a study of a center pays and wants to protect the affected population. While to our knowledge about the relationship between the facility and protect the population adds, retrospective studies are often EJ to questions that arise as part of the project analysis is not enough. The analysis predicted to measure concepts EJ If the project goes forward. They need it for.

When given an appropriate method of analysis should also be considered in this area include population and potential protected areas where they may be headed next year will be utilized to determine the method, general idea of the problem, possible population and area features to is known. The following are a few ways to identify populations protected (the federal Highway administration, 2000) and the necessary tools for the au useful analysis in a GIS provides.

The analysis has proven to be ahead of the promising methods for the identification of them are protected. Department of Housing and Urban Development (HUD) classification protected population through a comparison of the annual income of a household with an average income area (HUD, 1999). HUD, Income strategy issues for *low-income* households assume the most: *Yi with very low income families* (those with an average income 30% or less), *Low-income families* (those with an average income 50% or fewer), *And Yi with middle income families* (those with an average income 80% or fewer). This strategy also *is known* as the *poverty threshold, with an average household income through* Estimated America Census Bureau takes place. In other words, another version of the *instructions* for protected population to be determined and will be published each year by the Ministry of Health (Department of Health and Human Services, 2005).

#### **4 demographic and geographic analysis**

Database, spreadsheet and GIS software is often necessary for analysis. GIS used in Include data analysis From (A) define the study area, (b) analysis of the data to protect the population, (c) area overlaps with the impact of demographic data, (d) estimates of demographic characteristics of the population studied and (e) comparing indicators analysis to estimate. Basic demographic characteristics of the population in a region vital to the success of a center lead. Important demographic considerations include the total number of influential people in the region, the age distribution of the population, household income, race and ethnicity. Each of these definitions not only the volume of people served by these facilities, but also a variety of products to serve the needs of the consumer studied. GIS platform to display the video of the presentation facility location features. GIS Which is also

used in this study to protect the population and effectively manage spatial data and accurate and provides the ability to query results to decide the location provides visual facilities. One of the legal barriers of entry has many features that Local governments and municipalities is one of the obstacles. The barriers to entry to be considered as restrictions which will help to build facilities in certain locations, primarily based on facilities zoning requirements are (Davis, 2006). These requirements have been considered for analysis. For this study, barrier property by (X show) show that the proposed facility is available from the road. The information includes details of the type of measurement that include bearing and distance from the search field of land borders, such as city, division, or other forms including non-rectangular or irregular shape, so it is necessary to formulate the Central to the L suspicion of irregular payments (Davis and Jha, 2009). Irregular polygons that represent features of GIS and it's hardness to calculate the center of gravity.

## 6 model Formula

For evaluation this model is based on EJ -on the common evaluation facility location decisions impact on the population is protected from parts of the value of the property and the land of cost and distance parameters (i.e. restrictions and other characteristics of the components Analysis and are) used. Previous experimental studies gradient (difference) between property values and the distance between the road network per foot of about \$ 1 to \$ shown. This implies that every death on the average value of a mortgage-distance highway is estimated \$ 1 to \$ 4. This model of property values, parameters intended distance, race, household income and the value of user types Lands have been identified as factors that location and regional facilities decisions affect the . These facilities can be *N of the* locations may be placed on the needs of each network to enable the way is possible. Q geographic information system provides that we support management in relation to decisions affecting the field of transport and road network is Mel H. Meanwhile, an analysis based on multiple targets coordinates can be stored in the database and will be updated seamlessly. The corresponding function called multi-purpose function facility location is defined as an index that minimizes costs. Facility location function, the Developed and improved function of the cost of regional and local authorities. In this approach, the effects of previous costs are minimized and where to get used to a genetic algorithm optimization. Highway design with its limitations have an impact on low-income areas. The cost of a region (*LIC C*) the effects of a proposed highway alignment Shows in a low-income area. The purpose of the alignment, connection between two endpoints in two areas which is ranging from (streets, neighborhoods and highways). The cost of a region through GIS is

calculated. Geographic information systems, property and evaluate its features and the existing level of ideas.

Production including on log in materials primary and conversion it is to commodity final from way activity of assembly, making closed category with A. Management Stock Commodity from subjects that are important at total process of the supply chain which is at most decisions costs environment life and its fees of potential social perspective not to be responsible. To the subject example of the technique of management stock commodity that is right to JIT time when the company and the usage of it comes from the perspective life environmental disadvantages such as: transportation and transportation additionally, creation pressure additional to the traffic of the road, contamination air and contamination acoustic to environment is as well. In short time companies and the need for it have the maximum capacity of other active warehouses usages. Roads and the traffic navy shipment and transportation itself with lower density which is designed for the Second truck of good shipment, recovery shipment and Transportation that come from it through efficiency and recovery of them. In long time company should evaluate the second location establishment of other members of the supply chain, technology and structure channel distribution payment.

## **7 Case Study**

The part Of Involved at Chain supply With Relations Mutual are Therefore, That with Change one variable, Variables Several At Chain supply Under the impact The Will Was. At Chain supply Green To Way Overall try The Is until the At Decisions Managers Chain supply plus On cost Of Obvious, cost Of Intangible That All By the product Perspective Is not Is And On Environment Bio effects negative And Destructive have And To Way indirect By company the payment The A. On Phrase other Managers at Chain supply Green plus On At least of cost Of Usual Chain Security) Q costs, cost Inventory good And... (In Tai ra responsiveness To Responsibility social Organizations and Promotion Interest Productivity to Follow At least do cost of social Are.

The size of risk on the basis of Different from Such as amount effect and Likely to occur and whatever the results of this detailed step more to be said that the risk management process with higher reliability can be. Rating of risk and the key to this process is the process of identification and classification of risks specific to each project or organization begins and this is while in this sector in order to implement successful and efficient implementation of the risk management process, design risk breakdown structure (RBS), definition of criteria and

indicators of different sizes Finally, the risk of employing a method of making multi-attribute decision is carried out. As a result on the map GIS (Figure 2) locations under the protection of the population has a minority 65 % is. Residential property values in the area of the region of \$ 34,142 to \$ 3, 70,522 with an average value of 1, 27, \$ 230 is. Based on the eve of the analysis, the search space as low-income, most households are classified. The search space includes about 2,000 residential properties are. The land has a search space of features, such as agricultural, industrial, commercial and residential properties spanning an area of about 19.26 kilometers. In response to some risk studies and strategies to respond to risk and control in the supply chain is taken into consideration. Risk breakdown structure is a hierarchical structure of project risks and can be used to organize and guide the process of risk management to be employed. Given the diversity and abundance of supply chain risks under the influence day practically without identifying efficient and effective risk management and risk breakdown structure allows supply is limited. That is why in recent years by RBS as a tool for effective target identification and classification of risk is taken into consideration. In multiple studies, another to manage and assess risk in the supply chain in general and specifically discussed. Strategy Of Chain of supply To Two Strategy Response Accountability And Efficiency division The A. Chain Security Green With combination Two Strategies mentioned plus The interest advantage From Benefits due From Energy savings At Use From Resources, energy, warehouses, Prevention From Shipment And Transportation Waste, reduce pollution With Use From materials Raw Compatible With Environment Biology, Reduce waste and ... the benefits of efficiency And Or To Interpretation of From Strategy to reduce costs And Interest only The Is And From A hand With create Innovation At Design And produce Products Green And Able recycle plus To reduce costs Of Destruction Environment Bio From Strategy Response Accountability Or To Interpretation of From The strategy of differentiation Use The A . Company To Along Will A.

Organization And the manager of Environmental Biology and At All Cycle Life Products start to decreasing the Recovery of Function Environment Environmental chain supply of the confidence of them. In Indeed the chain of supply Green the integration management Environment Bio and management Chain of supply For Control of biomass Q of environmental At Cycle Life the product To By sharing Information and Coordination And cooperation All Members of the chain of supply is. Management chain, providing green, integrated Manufacturer management Chain of supply With Buyers bio- environmental At All levels Design the product, Selection And supply materials Primary, produce And Manufacturing, process Of Distribution And Transfer, delivery To customer And Finally So From Consumption, management recycle And Use this To Order to increase amount The

productive use of energy And References Along With Recovery Function The whole chain of supply Is. Green The chain That To Means an emphasis on the characteristic minimum consumption of energy And References And At least produce pollutant And At the length Chain of supply of Q d And With Way Of efficient Of system And Recovery Bio- environmental Function All Members of the chain of supply of The Be.

## **8 Conclusion**

In the past, little attention to the analysis of multi -dimensional of the main objectives in terms of location and facility location is the decision-making to protect the population. In this paper some of the effects of that property values and limits of the facility location problems and protect the population have been studied. A method of GIS has proven to be the source of good for the calculation of the automatic cost of the facility. This model, providing specific data and accurately for each zone can help planners and developers , so to understand the interaction between local communities, facilitates your further and scientific planning and efficient economy in relation to the project of the location of supply chain facility. With SGS and using this method as well as decision-makers, more easily can be understand the costs of trade-offs that are available there, so that optimum location near the facilities are provided. Illustrative examples in this paper sizes are relatively small so easy to using GIS to analyze the optimum payment. Algorithm using GIS can be the work of the focus of genetics that is necessary for optimal solutions.