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Relevance of Statistics Education in Sustainable Development

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Abstract
This study is designed to examine the relevance of Statistics in sustainable development. Current thinking about statistics should be in all human development and practices which reveals that the application of statistics and statistical methods in the construction of scientific knowledge in business, economics, accounting, banking, management & administration, astronomy, natural sciences, research, politics & election process, housing system, health sciences and weather forecasts as well as, to propose some improvement actions cannot be rule out, it is highly important. Statistics should no longer be seen as a side attraction but to be tolerated and allowed in all sectors. The challenges confronting the nation could be discussed and statistics has provided solutions and an eye opener for all. Finally, it was observed that for a nation to develop and be sustainable statistics should be implemented.

Key Words: Relevance, Statistics, Sustainable, Development.

Introduction

Sustainability is the process of living within the limits of available physical, natural and social resources in ways that allow the living systems in which humans are embedded to thrive in perpetuity. The definition of "sustainability" is the study of how natural systems function, remain diverse and produce everything it needs for the ecology to remain in balance. It also acknowledges that human civilisation takes resources to sustain our modern way of life. There are countless examples throughout human history where a civilisation has damaged its own environment and seriously affected its own survival chances. Sustainability takes into account how we might live in harmony with the natural world around us, protecting it from damage and destruction.

We now live in a modern, consumerist and largely urban existence throughout the developed world and we consume a lot of natural resources every day. In our urban centers, we consume more power than those who live in rural settingsand urban centers use a lot more power than average, keeping our streets and civic buildings lit, to power our appliances, our heating and other public and household power requirements. That's not to say that sustainable living should only focus on people who live in urban centers though, there are improvements to be made everywhere. Sustainability and sustainable development focuses on balancing that fine line between competing needs - our need to move forward technologically and economically, and the needs to protect the environments in which we and others live.

Sustainability is not just about the environment, it's also about our health as a society in ensuring that no people or areas of life suffer as a result of environmental legislation, and it's also about examining the longer term effects of the actions humanity takes and asking questions about how it may be improved.

Statistics are sets of mathematical equations that are used to analyze what is happening in the world around us. You have heard that today we live in the Information Age where we understand a great deal about the world around us. Much of this information was determined mathematically by using statistics. When used correctly, statistics tell us any trends in what happened in the past and can be useful in predicting what may happen in the future.Let's look at some examples of how statistics shape your life when you don't even know it. If you're taking a statistics class right now, you might be wondering just when exactly you are going to use this. Most people who aren't business majors or math majors often wonder what they need statistics for as it seems to be something only majors similar to those would need. However, statistics plays an important role in a great number of different fields, some of which you might not have expected. Here's a list of fields that use statistics and why it's important to each field. The fields are: business, economics, accounting, banking, management & administration, astronomy, natural sciences, research, politics & election process, housing system, health sciences and weather forecasts to mention but few.

The Role of Statistics in Businessand Stock Market

A defining business trend in the Digital Age has been the growth in the volume and the use of quantitative data. Increasingly, decisions once based on management intuition and experience now rely on empirical evidence drawn from statistical data. As the volume of data sets grows larger, the term "big data" has become an exhortation. Statistical evidence can inform business leaders about how their companies perform the effectiveness of their business operations and information about their customers. If you are a business major, you are familiar with the role statistics plays in your field. However, if you have not gotten to that point yet, here is some information on statistics in the business field. Statistics involves making decisions, and in the business world, you often have to make a quick decision then and there.

Using statistics, one can plan the production according to what the customer likes and wants, and you can check the quality of the products far more efficiently with statistical methods. In fact, many business activities can be completed with statistics including deciding a new location, marketing the product, and estimating what the profit will be on a new product. Blalock (2006) once said that what gets measured in business is what gets done. With this in mind, many business leaders rely on key performance indicators, (KPI) to measure how well their companies operate. The Balanced Scorecard Institute reported that

KPIs enable companies to measure results and determine what successful operations look like. Examples of KPIs include quarterly profits, customer satisfaction, and project completion rates, all of which can be quantitatively measured. KPIs require reliable statistical data, which companies then analyze on a regular basis to determine if they are meeting success measures. Another topic that you hear a lot about in the news is the stock market. Stock analysts also use statistical computer models to forecast what is happening in the economy.

The Role of Statistics in Mathematics

It should seem obvious that statistics plays a key role in mathematics considering it is a branch of applied mathematics. However, statistics is more than just its own separate branch of maths. You can find statistical techniques in integration, differentiation, and algebra and you can find those in statistics as well. Much of mathematics is based on probability and theories, and statistical methods help make those mathematical theories that much more accurate. Using averages, dispersions, and estimation allows you to come up with conclusions that are closer to the real answer than just taking a wild guess.

The Role of Statistics in Economics

Much of economics depend on statistics. Economists use statistics to collect information, analyze data, and test hypotheses. Relationships between supply and demand and imports and exports are found using statistical information. The same can be said for figuring out the inflation rate, the per capita income, and even the national income account. A good example of statistics and economics in the real world would be the Census Bureau and the information they collect and use to decide many other political items. Companies in many industrial sectors rely on statistics for other purposes, too. Orubuloye and Folakemi (2000) reported that some companies rely on data and statistics to enhance their abilities to compete with other firms. For other companies, statistics inform their efforts to develop better products and services. Some firms use data from sensors embedded in their products to offer such services as proactive maintenance, according to Orubuloye and Folakemi.

The Role of Statistics in Accounting

Ott (2008), Accounting involves mostly basic arithmetic, but when it comes to creating accounting reports, statistics plays a key role. When balancing and checking accounts, exactness is very important, but when using those reports to decide how well the company is doing and the trends within the business. You can also use statistics in accounting to create projections for the next fiscal year. Various statistical presentations like

histogram, bar-chart, pie-chart, frequency table etc can be used to explain to the understanding of every individual.

The Role of Statistics in Banking

Banks use statistics for a great number of the services they offer. A bank works on the idea that someone will deposit their money and not withdraw all of it later on. They earn their profit by lending money to others with interest, and the money they use is the money other people deposit. Ott (2008), Bankers use statistical approaches to estimate the number of people who will be making deposits compared to the number of people requesting loans. A great example of statistics used in banking is the Federal Deposit Insurance Corporation's quarterly publication called "Statistics on Banking".

The Role of Statistics in Management and Administration

A nation's government runs on statistics. They use statistical data to make their decisions regarding any number of things. Most federal and provincial budgets are designed upon statistical data because it is the most accurate data available when estimating expected expenditures and revenue. Another great example of statistics in the government is figuring out whether or not to raise the minimum wage due to a rise in the cost of living. Statistical data gives the government the best idea regarding whether or not the cost of living will continue to rise. Statistics not only help measure business performance, but can also provide a means for boosting it. Selltiz, Jahoda, Deutsch and Cook (2009) calls statistical data a frontier for business innovation, reporting that, as companies collect and store more data, they can gain insight into such issues as employee sick days and product inventories, looking for ways to improve performance. Some firms even use data and statistics to experiment with ways to improve management decisions, Selltiz et al reported.

The Role of Statistics in Astronomy

It is impossible to take out a ruler and measure the distance of the Earth from the sun. However, it would likely take you a very long time to measure such a distance anyway. Instead, astronomers use estimates and mathematical theories to devise their best guess to justify how far items in the universe are away from each other. This is why when you read a news report that a star will likely be going supernova "any day now," you have to understand that "any day now" could mean tomorrow, a year from now, or even ten thousand years from now.

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The Role of Statistics in the Natural and Social Sciences

Biology, Physics, Chemistry, Meteorology, Sociology, Communication, and even information technology all use statistics. Fehintola (2016) reported that for many of these categories (courses), the use of statistics in that field involves collecting data, analyzing it, coming up with a hypothesis, and testing that hypothesis. In biology, the use of statistics within that field is known as biostatistics, biometry, or biometrics. Biostatistics often involves the design of experiments in medicine, agriculture, and fishery. It also involves collecting, summarizing, and analyzing the data received from those experiments as well as the decided results. Medical biostatistics is a separate branch that deals mainly with medicine and health. Physics uses probability theory and statistics dealing mainly with the estimation of large populations. In fact, the phenomenological results of thermodynamics were developed using the mechanics of statistics. There are further examples of statistics in these sciences fields including analytical chemistry, which involves the presentation of problems in data analysis and demonstrating steps to solve them. Meteorology uses statistics in stochastic-dynamic prediction, weather forecasting, probability forecasting, and a number of other fields. Sociology uses statistics to describe, explain, and predict from data received. Like many of the sciences, communication uses statistical methods to communicate data received. Information technology also uses statistics to predict particular outcomes. Agricultural Statistics is of prime importance as far as the Agriculture Industry is concerned. Agricultural Statistics ascertain the crop production, crop yield, qualities of the crops produced. It also furnishes information about the different operations and the different methods which can be adopted for improving the crop output.

In some countries, Agriculture Industry makes up the major segment of economy. The entire population of that country in some way or the other depends on (AgricultureSelltiz, Jahoda, Deutsch and Cook (2009)). Agriculture Statistics in such countries also provide information about the employment it provides to the innumerable individuals. Agriculture statistics in the countries dominated by agriculture imply that Agriculture industry contributes approximately 24% of the GDP or Gross Domestic Products. It helps us to compare the different yields of crops, quality check of crops compared to the quality of crops produced in other parts. It furnishes a rough outline of the incidence of various operations with regard to the Agriculture industry.

Agricultural Statistics covers Rainfall Statistics, Area Statistics comprising the data on Land Use, Area & Production and Yield Statistics of various crops produced in the state. Estimate crop size, livestock production, model weather, and export/import. It's everywhere in Agriculture down to chemical application and fertilizer application. There is a whole agency devoted to statistics in agriculture called National Agriculture Statistics Service.

The Role of Statistics in Research

Statistics is not a total of rules and recipes for the analysis of data. It is not exhausted in the use of complicated computerized programs and nice graphs. Fehintola (2016), reported that it requires a good knowledge of the observed phenomenon, the organization of observation, good knowledge of gathered data, and description and examination of hypotheses for the parameters of the analyzed phenomenon. In the level of Higher Education Statistics is taught as an obligatory subject in all university departments with a main goal the students' comprehension for the use of statistical techniques orientated to the specific field of knowledge. Although students of so-called "theoretical"departments consider that they do not have a good relation with numbers, mathematics, statistics and computers, the need of experimental research leads them to the need of understanding and using not only of simple descriptive methods, but especially advanced statistical techniques which demand mainly "mathematical thought", that is the ability of constructing, using and explaining abstract models from daily examples.

The Role of Statistics in Election Process and Political Campaigns

Whenever there is an election, the news organizations consult their models when they try to predict who the winner is. Candidates consult voter polls to determine where and how they campaigned. Statistics play a part in whom your elected government officials will be. Speaking of statistical surveys, one of the serious professional issues in survey design is determining how to ask questions so they will be understood properly and will elicit sensible answers. When the survey is in pencil and paper form, rather than through personal or telephone interview, the issues in the design of that form are very similar to the issues in the design of ballots. Parikh, Hazra, Mukherjee and Gogtay (2010) reported that professional survey statisticians know that any such design must be tested either in a laboratory or in the field or both. Because of this expertise, they are exceptionally well equipped to assist election officials to avoid ballot design-induced voting errors. Qualified poll observers should fill out forms showing how well each part of the election plan worked at each polling place. Plans for future elections should rely on statistical analyses of such data to clarify how well the election system served the voters and help identify needed improvements." That is an essential element of process quality control. Also from that same column, "Exit polls and post-election surveys are inherently statistical. As always, samples must be random and scientifically designed. Proper analysis and interpretation of such data can help explain results that may appear to be wrong on the surface. Maintaining checks on every election is the best way to make sure any errors or problems with an election process are found and fixed."

The Role of Statistics in the Housing System

The Housing Statistics Strategy will assist the development of a range of consistent data sets, within an agreed framework, capable of informing discussion on key housing issues. Housing statistics must be relevant, timely and accurate, and disseminated efficiently. The development of high quality housing statistics will help central and regional government formulate and evaluate housing policy, as well as informing either the federal, state or local government about local housing markets. Parikh, Hazra, Mukherjee and Gogtay (2010) said housing problems are geographical in nature, occur in a local context and should not be obscured by a purely national framework. Understanding housing issues in local communities, where there is housing need, is essential to help diminish housing disparities and to generate effective housing policy at both a regional and national level. While specific in nature, local housing issues do reflect national concerns, ensuring that the building of housing knowledge at a regional level will also help construct a national picture of housing. The Ministry of Work and Housing administers the Residential Tenancies Act 1986. Its principal functions are to receive and invest bond monies from residential tenancies, and to refund them when lawfully due; to provide information, advice and a disputes resolution services to tenants and landlords, and to advise Ministers on governance and the performance of Housing ministry.

The Role of Statistics in Weather Forecasts

Do you watch the weather forecast sometime during the day? How do you use that information? Have you ever heard the forecaster talk about weather models? These computer models are built using statistics that compare prior weather conditions with current weather to predict future weather. Newton and Rudestain (2009), asked, what happens if the forecast indicates that a hurricane is imminent or that tornadoes are likely to occur? Emergency management agency's move into high gear to be ready to rescue people. Emergency teams rely on statistics to tell them when danger may occur.

The Role of Statistics in Medical & Genetics studies

Lots of times on the news reports, statistics about a disease are reported. If the reporter simply reports the number of people who either have the disease or who have died from it, it's an interesting fact but it might not mean much to your life. But when statistics become involved, you have a better idea of how that disease may affect you. For example, studies have shown that 85 to 95 percent of lung cancers are smoking related. Newton and Rudestain (2009) said the statistic should tell you that almost all lung cancers are related to smoking and that if you want to have a good chance of avoiding lung cancer, you shouldn't smoke. Scientists must show a statistically valid rate of effectiveness before any drug can be

prescribed. Statistics are behind every medical study you hear about. Many people are afflicted with diseases that come from their genetic make-up and these diseases can potentially be passed on to their children. Statistics are critical in determining the chances of a new baby being affected by the disease.

The Role of Statistics in Quality Testing & Consumer Goods

Companies make thousands of products every day and each company must make sure that a good quality item is sold. But a company can't test each and every item that they ship to you, the consumer. So the company uses statistics to test just a few, called a sample, of what they make. If the sample passes quality tests, then the company assumes that all the items made in the group, called a batch, are good. Worldwide leading retailer, keeps track of everything they sell and use statistics to calculate what to supply to each store and when. From analyzing their vast store of information, for example, supplier decided that people buy one good or the others when a given weather is predicted. So they ship the product that is relevant to stores based upon the weather forecast.

Conclusion

If the knowledge of statistics is put into use as it pointed out in the above outlines it will help a lot to reduce the problems and challenges we are facing in this country. Because a majority of problems and challenges we are facing stems out from the fact that we do not know the total number of the people living in this country and we do not know their immediate needs that why we are facing the problems and challenges at hand. If statistics knowledge is used as expects the government will know the number of people that needs one thing or the other.

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