

THE INTERNATIONAL JOURNAL OF HUMANITIES & SOCIAL STUDIES

Identification of Determinants of Students' Academic Performance in Flood Affected Areas: With Special Reference to Ratnapura District in Sri Lanka

N. M. AnuraJayasinghe

Senior Lecturer, Department of Economics,
University of Sri Jayewardenepura, Gangodawila, Nugegoda, Sri Lanka

Abstract:

Floods, as a natural disaster that affect most of the Sri Lankans, have undoubtedly the biggest impact on the lives of Sri Lankans. Although floods affect all facets of life economic, social, cultural and environmental. This study attempts to examine the identification of determinants of Students' Academic Performance in Flood Affected areas. Data were collected through questionnaires and interviews conducted with 448 grades 10 and 11 students from four schools of the Rathnapura Education Zone. The students were chosen based on the position they had obtained in class during examinations. The data collected were subjected to chi-square testing, and factors that significantly affect the SAP (Students' Academic Performance) were identified. Then the impact of these factors on the SAP were measured using a logistic model. The researcher chose this area as it was ideal for testing the hypothesis. 78% of students from 87% of households were affected by floods and 92.6% have had a decline in their SAP after being affected by floods. The study further discovered that several other factors, including the employment status of the mother, the time spent on self-studies and the students' athletic performance also had a significant impact on the SAP of the children. According to the model on the SAP of students, a child who is affected by floods has a 45% probability of seeing a decline in SAP. This number goes up to 93%, if the mother of the flood affected student is employed. The study also reveals how some families have taken measures to minimize the effects of floods on the education of their children, as they are affected by floods annually. Among these methods are sending their children to tuition classes and using new technology to counterbalance the loss of printed educational material. It is worth noting that 15% of families have taken steps to digitize the notes and texts of their children. Those who are annually affected by floods are those who live near the river and in adjoining lowlands. Those living in flood prone areas must be moved to lands in other areas. Since the continuous presence of the mother enhances the students' SAP, the research suggests that if the mother is working she should be given the opportunity to leave work early when and if her child is preparing for an important examination. The prosperity and the efficiency of a nation develop only when its human capital develops. Thus, parents must also encourage their children to take part in sports which has a beneficial and positive impact on health as well as education.

Keywords: Education, employment status of mother, logistic regression, natural disaster, students' academic performance

1. Introduction

Natural disasters have been one of the most alarming scenarios in the process of human capital development and socio-economic decision making in both developed and developing contexts of the world (Mudavanhu, 2014; Baez, 2010; Mwape, 2009; Stanley & William, 2005). The occurrences of natural disasters by type have been reported, in the world map of natural disasters, to be 39 percent flood, 30 percent storms, 8 percent earthquakes and 23 percent other hazards (ADRC, 2015). In the developing region, floods have been the most pressing issue that affects the socio-cultural and economic life of countries; especially in the Asian and African contexts (ADRC, 2015; Doocy, et. al., 2010; Jonkman&Kelman, 2005; Jonkman, 2005; Noji, 2000). In Sri Lanka also, floods have been the most frequent phenomena compared to other natural disasters (World Bank 2017, DMC, 2010; Jegarasasingam 2010). The settlers by the rivers of Kelani, Kalu, Gin, Nilwala and Mahaweli have been highly vulnerable to floods with severe damages to both lives and properties. The impact of floods on the formation of human capital is the most significant component among these damages; the effects of floods on the process of schooling and family economy of a student have always disrupted the formation of human capital. Therefore, this study intends to investigate the effects of flood on the formation of human capital in terms of school education in the Sri Lankan context.

According to the Disaster Management Center (2014), residents of 16 to 23 districts, out of 25 districts in Sri Lanka, are affected by floods each year between May to September and December to February. This indicates that flooding is not only limited to the wet zone; a significant number of people living in the dry zone too are periodically affected by floods. According to DMC (2011), floods threaten the lives of 1.1 million people, their properties and livelihoods. Moreover,

189,000 students living in these areas are also affected by floods (Plan International, 2017). According to the Ministry of Education, at least 171 schools have been destroyed due to floods that occurred in late 2016 and early 2017, and 36 schools have been used as temporary shelters (Disaster Management Center, 2010). Meanwhile, it has been estimated that 70,000 students need a complete set of equipment necessary for schooling, out of which the supply of necessary text books and school uniforms has been taken over by the government. However, the ministry of education has found it difficult to restore the schools used as temporary shelters into their original state, due to the alterations made by the displaced people (Disaster Management Center, 2010). Moreover, disputes and physical disturbances in opening the schools and the psychological impact of floods have been highly influential particularly in terms of attitudinal and behavioral development of students. Consequently, these circumstances, while disturbing the smooth functioning of the learning process scheduled under school curriculums, have started to affect the human capital formation considerably.

However, the flood does not equally affect all the households, for the impact of floods is basically determined by geographical factors. Rich households have the capabilities of avoiding the effects of flood unlike the others who are vulnerable to floods. Furthermore, it is noticeable that gender, age and the effects of such demographic factors and socio-economic factors also play a key role in determining the effects of flood. Therefore, it is important to study the effect of floods on the formation of human capital, for such studies carry the potential for mitigating the harmful effects of floods on transforming children in all flood affected areas of the country into valuable human capital.

1.1. Study Problem

Sri Lanka has always been proud of its standard of living and its advanced human capital formation as a result of free universal education and healthcare (Taniguchi, 2017). Free universal education has enabled children from the furthest reaches of the country to obtain education and to enjoy a certain standard of wellbeing. Moreover, unlike many other developing countries, Sri Lanka also offers free university education, which opens up the opportunity for numerous talented children from any social strata to enter universities. Then, assisted by various student aid programmes, they obtain prospective employment that allows them to enjoy a higher and better standard of living compared to their parents. However, with the increase of the incidents of floods and the impact on school education of children that follows, there have been serious concerns as to whether flood would chip away the achievements in living standards by adversely affecting human capital formation of children. Moreover, flood has the potential of upsetting social mobility; the fact that only those who earn higher incomes are capable of better mitigating the effects of floods can later lead to social unrest. Unfortunately, since precious little has been done to gauge the impact of such disasters, addressing such concerns at best will be ad hoc and unsystematic. Therefore, the problem of the study involves identification of determinants of Students' Academic Performance in Flood Affected areas.

1.2. Aims and Objectives

This study focused to investigate of determinants of Students' Academic Performance that occurs in schools located in the flood affected areas, and to recognize the ways and means of averting and mitigating its adverse effects. Following research objectives would facilitate the achievement of these aims.

- Analyzing the effects of floods to the income of the family and thereby to the academic performance of students.
- Analyzing the effects of floods to schools and thereby to the academic performance of students.

2. Literature Review

A study conducted by the Asian Disaster Preparedness Center in 2008 in Cambodia reveals that floods generally cause much more damage to the education sector than droughts do. Every year, floods provoke delay of study programs and damages to schools; mainly those located in the aforementioned flood prone areas. According to the findings of the survey, flood is one of the factors that disrupt the study program accomplishment, affecting the quality of the current education in Cambodia, particularly in provinces which are prone to floods and where schools have been constructed without proper flood resilient features. When there is flood, students always encounter difficulties to go to schools because of road damages and having to travel across rivers. Usually, they have to take a boat to go to schools, which takes a longer time and higher cost. Such difficulties could in turn lead to high absenteeism rates of poor students at the beginning of each academic year. In some cases, schools are used as emergency shelters during the floods, resulting in damages to school infrastructures, especially floors of school buildings. At this point, impact of floods on education sector has been discussed under four fields; difficulty in accessing schools, high drop-out rates caused by floods, disruptions to the completion of the study programs and use of schools as emergency shelters.

The academic performance of a student depends on a number of reasons. According to Ali et. al. (2013) 'students' academic gain and learning performance is affected by numerous factors including gender, age, teaching faculty, students' schooling, social and economic status of the father/guardian, residential area of students, medium of instructions in schools, tuition trend, daily study hours and accommodation as hostels or day scholar.' Moreover Graetz, (1995) states that 'a student educational success is contingent heavily on social status of students' parents/ guardians in the society'. Meanwhile Considine and Zappala (2002) assert that parent's income or social status positively affects the student's test score in examinations. What the existing literature collectively indicates is how the academic performance of a student is highly influenced by his or her socio-economic background as well as other environmental factors the student is subjected to. Hence, it is safe and acceptable to depend on the test scores of a student to determine his or her academic performance. According to Maric and Sakac (2014), students' factors that affect their academic performance could be classified into Internal and social factors. They found that the internal factors that influence students' academic performance included

interest in content of a subject, internal satisfaction, and aspiration. The social factors also included social prestige and material reward. MeenuDev (2016) confirmed that student's level of interest in a subject influence their academic performance. Similarly, Kpolovie, Joe, and Okoto (2014) stated that student's attitude to school and their interest in learning influence their academic performance.

Teachers play vital role towards the academic performance of students. According to Kimani, Kara and Njagi (2013) in Kenya on teacher factors influencing academic achievement found that teachers experience, age, gender and professional qualification had no statistically significant relationship with academic performance of students. However, they noticed that performance targets, completion of syllabus, paying attention to weak students, assignments, student evaluation, and the teaching workload of a teacher had significant relationship with students' academic performance. In Nigeria, Akiri and Ugborugbo (2009) also found that there is no statistical relationship between teacher effectiveness and academic performance.

Recent studies have discovered that parental involvement have a positive impact on the academic performance their wards. For example, McNeal (2014) revealed that parent involvement directly affects the behaviour and students' attitudes but indirectly influence their academic performance. In Ghana, Chowa, Masa and Tucker (2013) posited that the involvement of parents towards their wards academic performance is categorized into home-based and school-based parental involvement.

Matinez (2015); Rafiq, Fatima, Sohail, Saleem and Khan (2013); Mutodi and Ngirande (2014) emphasized that students with high level of parental involvement in their academics significantly perform better than those students with no parental involvement in English Language arts and Mathematics. Using a multiple mediational analysis, Topor, Keane, Shelton and Calkins (2010) found that there is a statistical significance association between parental involvement and the wards academic performance.

According to Ogbugo-Ololube (2016); Khan, Iqbal and Tasneem (2015); Muthoni (2013) parents with higher level of education show much interest in the academic performance of their wards. They observed there is a positive significant relationship between the level of parents' education and students' academic performance.

3. Methodology

The population of this study comprises of students across Sri Lanka, who are undergoing secondary education, facing the threat of floods. Thus, the ideal solution would be to assess each, and every student affected by floods in the whole country. However, given the enormity of the population, it was decided that taking a sample from a specific geographical area that often faces floods to represent the country as a whole would be more practical. The geographical area of the study was selected based on two criteria; the area having been continuously affected by floods for a considerable period of time, and secondly, the area having a significant number of schools affected by floods due to their geographical location. Thus, the target population was selected from Rathnapura District, as it is one of the most frequently flooded areas in the country. The district is located in one of the regions that receive the highest rainfall in Sri Lanka. As a result, the district is often affected by hydro metrological disasters.

The second step of the sample procedure being selecting an educational zone in Rathnapura District, Rathnapura Educational Zone was selected out of seven (07) educational zones in the district, as it comprises the components needed for the study such as socio-economic variance and types of flood affection. Rathnapura Educational Zone consists of five (05) divisions; Rathnapura-I Education Division was selected as the third, step of the procedure, for it was the division that best represented the study-related characteristics. Rathnapura-I division consists of 29 schools representing 1AB, 1C, Type 2, and Type 3 categories (Sabaragamuwa Provincial Department of Education, 2016). They are run by either the central government or the provincial councils. As the fourth step, considering the convenience of the sampling, the sample was taken from the schools in the category of 1C. By using the Stratified Random Sampling method, selected three (03) schools in the Division that best fit the required homogeneous characteristics of the sample.

Finally, students currently enrolled in studies in grade 10 and 11 were chosen from a population of potential participants as the sample for the study. Since its critical to carefully examine whether the selected sample fits to the study objectives, the selection of this sample was based on several factors; (i) the students of grade 10 and 11 focusing on facing G.C.E. Ordinary Level examination, which is the first serious academic hurdle, independently faced, in their life as students, (ii) these students' focus on studies on their own accord, (iii) these students belonging to community of students who are concerned about their academic performance for the first time. Furthermore, by using Simple Random Sampling technique, 440 students were selected out of 616 student names in the student attendance registries in the selected schools.

The collection of data took place in two phases. The main concern of the first phase was collecting data on the student's family backgrounds and the impact of floods. Collecting data on the academic performance was the focus of the second phase. The researcher used a structured questionnaire, in-depth interviews and a survey of households for to collect data.

The study applied descriptive analytical methods in four stages of the analysis, Firstly, the simplest method of the numerical method of presenting data was used in the study in the forms of values and percentages. Secondly, the tables which comprise of simple tabulation and cross tabulation being a method of analyzing data, to organize, present, identify and compare the values related to variables of the study, they were used as a descriptive analysis method. Thirdly, the analysis was made using bar charts, column charts, pie charts, and line charts to identify the relationship and behavior of variables. Finally, in order to better understand the behavior of the variables, the Chi-square Test was applied to identify the relationship between each independent variable and the dependent variable.

4. Results and Discussion

The income levels of the households (and respondents) make a considerably direct impact on the sample respondents' decisions making processes as they have been used as the most important and decisive variable for the social science tests. In a range of the six different income groups, the highest percentage of respondents, i.e., 46%, belongs to the Rs.10,000 to Rs.25,000 per month. Similarly, the second highest percentage of respondents fall into the income category of Rs.25,000 to Rs.35,000 rupees per month, while only 5.6% of the respondents earn more than Rs.55,000 per month. According to the given information, it is clear that the majority of the sample respondents are relatively low-income earners.

Out of all the respondents (household heads) in the study sample, a majority have had no education above the level of grade 5, and as a percentage it is 25%. The percentage of people who have not received formal school education is as low as 7%. However, a high percentage of respondents within the sample have received at least some form of proper education, and in most cases, it is beyond the level of primary education.

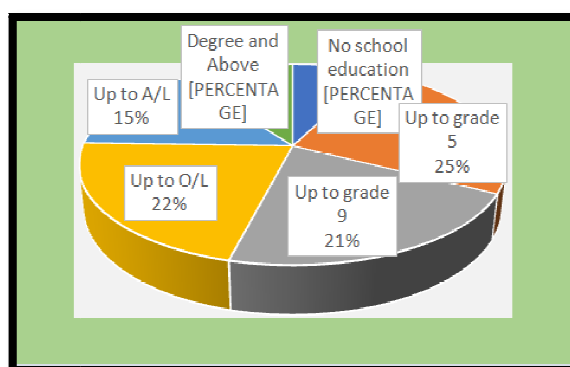


Figure 1: Level of Education of Household Heads

Source: Sample Survey Conducted by the Author in 2017

The relationship between the level of education and income level of the main income earner is a vital factor to be analyzed. Information in regard to the respondent's level of education has been acquired through several categories that include information about their income status. The study reveals that most of the respondents employed in the government sector possess a graduate or equal level educational qualification and it is 47.1% as a percentage. Similarly, a percentage of 41.2 % respondents, who have received education up to G.C.E. Advance Level, are also employed in the government sector. This can be identified as a result of certain recruitment regulations imposed by the government in terms of filling their vacancies. Interestingly, most of the private sector employees in the sample have studied only up to grade five or nine and most of them are engaged in jobs such as providing security services or other minor jobs. In contrast, the respondents who engaged in business activities have educated only up to G.C.E. Ordinary Level and a majority of 30.8% have not reached the educational levels above that level.

According to the percentage of households that spend a monthly amount higher than Rs. 9,000 for education is 39.5%, and the second-highest recorded expenditure for education is Rs. 6,000-9,000 per month, which, as a percentage is 27.5%. The mode value of the amount of money allocated for education by each household being Rs. 6,000, it is observed that most of the households in the sample spend an amount similar or close to Rs. 6,000 for their children's education. However, the cost of education is Rs.8, 445.00 on average; although it is a free education system that exists in Sri Lanka, each household is required to spend some amount of money on children education. On the other hand, the study discloses that, every household is voluntarily prepared to take the responsibility of bearing expenses of their children's education.

The SAP of 68% of the male students in the total sample has decreased and SAP of 32% has increased. Meanwhile the SAP of 62% female students has declined, and an improvement of the SAP is observed in 38%. On average, the SAP of 64% of the students has declined. However, it is evident that there is no significant relationship between gender and the increase in SAP ($\chi^2 = 1.662$, $df = 1$, $P < 0$). Thus, the null hypothesis has to be accepted; gender is not a determining factor of a student's SAP. Out of the total sample, 3.5% of the mothers have not obtained any form of formal education, and 40% of the mothers have obtained only the primary education. However, 35% of the mothers have obtained secondary education and 21% of the mothers, tertiary education. Those who have attended school from grade 1 to 5 are considered the ones with a primary education, and those who have attended school from grade 6 to 12 are considered to have received secondary education. Respondents who possess a university degree, professional qualification or other post-graduate education are considered the holders of tertiary educational qualifications. The Chi- Square test proves that the level of the education of the mother has a positive relationship upon the increase in the SAP ($\chi^2 = 186.066$, $df = 3$, $p = 0$). Therefore, null hypothesis is rejected and observed relationship is statistically significant.

The SAP declines in line with the drops of the educational achievements of their mothers. The SAP of the children, whose mothers has had no school education or just the primary education, has declined by 56.3% and 81.7 % respectively. However, it is worth mentioning that the SAP of the children, whose mothers has had secondary education, has also declined by 80.1%. Further studies are recommended to be conducted to comprehend the reasons and rationales behind this phenomenon. The study identifies that the higher the educational attainment of the mother gets, the higher the academic performance of the child gets. Out of the respondents, 43% of the fathers have not obtained any formal

education, and 44% of the fathers have had only primary education. 41% of the fathers had obtained secondary education while 11% of the fathers have reached the tertiary of education. Provided that in Sri Lanka, in most cases, it is the fathers that make important decisions in the family, researcher endeavors to determine whether he has had any significant effect on the child's academic performance. The tests indicate that the level of the education of the father does not exist a positive relationship upon the increase in the SAP ($\chi^2 = 0.202$, $df = 3$, $P > 0$). This is mainly due to the fact that, it is the mother who supervises the child's education, in general, and because the father, in many instances, is just the income provider of the family.

Approximately 51% of the females in the sample are not engaged in any income generating employment. Most of them are housewives, and they manage the income generated by the husbands. Being housewives, all the household activities come under their supervision, which is one of the main reasons why mothers play such a key role in the education of their children. The study intends to determine the impact of the mother who is not engaged in an income generating employment (0) and the mother who is engaged in an income generating employment (1) on the child's education. The analysis emphasizes that there is a positive relationship exists between the nature of the mother's employment and the increase in the SAP ($\chi^2 = 37.236$, $df = 1$, $p = 0$). It is understood that the reason that governs such a strong connection is the mothers who are not engaged in any income generating employment having more time to spend with their children and supervise their education.

In this context, father is the main income earner of the family; his income is an important factor that determines the economic and social status/wellbeing of the family. The study attempts to analyze any possible impacts by father's employment, which determines the living standard of the family, on the SAP. There are two categories of employment analyzed; those who possess a steady stream of income (1) and those who do not possess a steady stream of income (0). Most of the fathers in the sample, 53.5%, are engaged in activities that generate a steady income, and when a father is engaged in such an employment a positive relationship on the increase in the SAP of the children is observed ($\chi^2 = 10.221$, $df = 1$, $p = 0$). The main reason for this positive impact, as identified, is the stability of the father's permanent source of income, which enables a stable and consistent allocation of money for education of their children. Moreover, the social privilege of being a member of such a household also elevates the child to maintain a high SAP.

The income of the household is one of the main demographic factors. A number of studies have discovered that children and youths from low socio-economic backgrounds tend to be weak and poor in performance at school. Their performance in standard tests, compared to that of privileged children, is inadequate on average. There is also a tendency that such students would likely drop school or higher education. Finance allocated for all expenditure are dependent on the family income, and the study has identified a significant positive relationship between household income and increase in the SAP ($\chi^2 = 25.515$, $df = 29$, $P = 0$). This factor has been replicated in many other studies, in which the researchers have identified significant, but modest, links between household income and children's achievements and behavior.

Studying the income categories and the SAP, it becomes evident that if the monthly income of the family exceeds Rs. 90,000, children of such households very often perform better academically. The main reason for this boost in performance is ability given by such substantial financial allocations to successfully facilitate and resource the education of their children. It enhances the quality of the education they receive. However, in certain cases, high-level family income is observed leading the academic performance of the students to a drop. This is comprehended as a result of children's focus, expected on education, being diverted to other activities due to the fact that they come from financially well-supported backgrounds.

The expenditure on education increases as the number of family members engaged in studies increases. However, this also means, for the most part, that the funds allocated per child become less. Such drops in the amount of finances allocated for a child's education often decrease his/her ability to perform better in academics. This study has identified that the number of family members engaged in studies have an effective impact on the academic performance of the students ($\chi^2 = 22.707$, $df = 2$, $P = 0$). Out of all the households in the sample, 67% have only one family member engaged in studies.



Figure 2: Expenditure on Education, Family Members and SAP Differences
Source: Sample Survey Conducted by the Author In 2017

Money spent on education is an investment to develop human capital. Often parents prioritize the education of their children over a lot of other things. Because they believe that education is the key in enhancing the living standards of their children in the future. The research shows that the expenditure on child's education by the households has a significant positive relationship with increase in the SAP ($\chi^2 = 24.346$, $df = 3$, $p = 0$).

The amount of money a family can allocate for education depends on the income of the household. The study clearly demonstrates that 48% of households that make over Rs. 30,000 per month spend between Rs. 3,000 to Rs. 6,000 for the education of their children; roughly about 20% of the monthly income. Even certain low-income earning households allocate significant financial resources on the education of their children. Middle income earning households allocate between 15%-16% of their monthly income for the education of their children. Educating their children well is perceived as the most effectual way of obtaining better jobs in the future and reaping economic and as well as social benefits. Interestingly, the monthly allocation of finances on the education of children and the academic performance of the students are significantly related ($\chi^2 = 3.156$, $df = 15$, $p = 0$).

Considering the above analysis, it can be identified that the demographic factors like the level of education of mother, the fact that the mother is not employed, father having a stable income, household monthly income and number of family members engaged in studies have significant positive relationship with increase in the SAP. In contrast, factors like gender and the level of educational attainment of the father have no substantial link with the SAP.

Factor	Chi-Square Test Results	Decision*
Gender	$\chi^2 = 1.662, df = 1, p > 0$	There is a relationship between gender and the increase in the academic performance
Mothers' level of education	$\chi^2 = 1.861e2, df = 3, p = 0$	A positive relationship would exist between the educational level of the mother and the increase in the academic performance
Fathers' level of education	$\chi^2 = 0.202, df = 3, p > 0$	A positive relationship would exist between the educational level of the father and the increase in the academic performance
Nature of the mother's Employment	$\chi^2 = 1.431e2, df = 1, p = 0$	A positive relationship would exist between the nature of the mother's job and the increase in the academic performance
Nature of the father's Employment	$\chi^2 = 10.675, df = 1, p = 0$	A positive relationship would exist between the nature of the father's job and the increase in the academic performance
Household income	$\chi^2 = 24.281, df = 5, p = 0$	A positive relationship would exist between the income of the family and the increase in the academic performance
No. of members who are engage to education	$\chi^2 = 22.707, df = 2, p = 0$	There is an association with SAP
Expenditure on education	$\chi^2 = 24.346, df = 3, p = 0$	A positive relationship would exist between the expenditure on education and the increase in the academic performance

Table 1: SAP Differences and Demographic Factors

* Significant Level Is 95%

Source: Sample Survey Conducted by the Author in 2017

The SAP is not completely dependent on demographic factors. A number of non-demographic factors also play a significant role in determining the SAP. This section deals with the researcher's attempts to conclude as to what non-demographic factors have a significant relationship in determining the SAP. The factors taken into account here are the athletic performance of a student, self-study time, access to private tuition and the manner in which they faced the threat

of floods. Health is an important factor that determines the success of a person (Hoddinott, et. al., 2008) Healthy students usually perform better academically. Sports play an important role in creating a healthy child. It is also widely accepted that a student who can successfully balance both academic and sports activities can obtain great results. The researcher attempts to determine whether the athletic performance of a student has an impact on SAP. The researcher has created a scale to measure athletic performance of a student, by introducing a marking scheme based on the victories the student obtained at various levels in sports. According to hypothesis testing, athletic performance of a student has a positive relationship with the increase of his/her SAP ($\chi^2 = 3.394E2$, $df = 4$, $p = 0.00$). Thus, although there is no direct relationship between the two, the athletic performance of the students does enhance their academic performance.

A student who is engaged in systematic education needs to engage in self-studies to improve knowledge and practice. This research attempts to determine whether self-studies have had a positive impact on improving academic performance. The research has discovered a significant positive relationship between self-studies and increase in the academic performance ($\chi^2 = 49.85$, $df = 5$, $p = 0$). Majority of the students in the sample, covering a percentage of 63% engage in self-studies for three hours or less. The average time spent on self-studies by a student is 195.88 minutes (SD 96.801). A Sri Lankan student spends six hours a day in the school and another two hours, on average, in tuition classes. With the three hours spent on self-studies, a student on average spends 11 hours on studying. Thus, the student has a limited number of hours left for other activities, i.e., sports, hobbies and, importantly, sleep. Thus, it is best option for a student spending maximum 3 hours a day on self-studies, so that he or she will also have time to spend on other activities.

With the competitiveness of the modern Sri Lankan Education System, most students undergo a considerable pressure to perform well at several key examinations. Grade five scholarship examination, GCE O/L and A/L examinations are prominent among them. Due to the intensity of the competition, most of the students attend private tuition classes in addition to the school. Therefore, attending tuition classes play an important role in modern education. The research attempts to examine whether a significant relationship exists between attending tuition classes and academic performance. However, the results reveal that a negative relationship would exist between the two ($\chi^2 = 0.988$, $df = 1$, $p < 0$). Therefore, null hypothesis would be accepted. This finding raises concerns about the validity of the assumption that tuition is essential for success at examinations.

Estimating the impact of floods on the SAP is the main objective of this research. Floods have a profound impact on the lives of those who are affected from this. Education of the children being affected by floods is one of the main negative consequences of floods. Floods affect both the humans and the educational materials and resources. A chi square test was conducted to determine whether the effects of floods on human and material resources are connected to education, and thus, on the SAP. The results indicate a significant negative relationship between effects of floods and increase in the SAP ($\chi^2 = 271.818$, $df = 1$, $p = 0$).

The above analysis indicates a number of non-demographic factors that positively affect the academic performance of a student. They are the athletic performance of students, the time spent on self-study, and the effect of floods. In order to determine the impact of SAP in relation to demographic factors identified in section one, and the non-demographic factors identified in section two, the relationship between the factors were tested. A correlation analysis was conducted between the different variables.

Variable	Chi-Square Test Results	Decision*
Athletic performance	$\chi^2 = 58.591$, $df = 20$, $P = 0$	A positive relationship would exist between the athletic performance and the increase in the academic performance
Self-study time	$\chi^2 = 49.85$, $df = 5$, $p = 0$	A positive relationship would exist between the self-study time and the increase in the academic performance
Attending tuition	$\chi^2 = 0.988$, $df = 1$, $p > 0$	A positive relationship would exist between attending tuition classes and the increase in the academic performance
Effect of floods	$\chi^2 = 271.818$, $df = 1$, $p = 0$	A negative relationship would exist between the effects of floods and the increase in the academic performance

Table 2: SAP Differences and Non-Demographic Factors

Source: Sample Survey Conducted by the Author in 2017

*Significant Level Is 95%

5. Conclusions

Performance and the productivity of the economy depends on the efficient utilization of resource distribution. Natural disasters prevent the efficient distribution of resources by destroying tangible assets such as buildings and equipment – as well as human capital – and thereby deteriorating the production capacity of the economy.

For Sri Lankans floods is the most common natural disaster they face, and it affects their personal economy. The study attempts to determine how floods, which affect all sectors including economy, society and culture, affect the accumulation of human capital through education. Ratnapura district which is one of the most flood prone areas were considered the target geographical area and 440 students, studying in grade 10 and 11 in four schools in Ratnapura education zone, was chosen as the sample of the study.

According to country profiles published by the CRED, Ratnapura faces the threat of floods between May and June each year, and it is one of the areas where the damages caused by the floods are severe. On the other hand, it is an area that has a number of schools, including 'top-tier' schools. Every detail suggests that this is the ideal location for the study. The study attempts to build a model on how floods affect the human capital formation in a quantifiable manner, to identify the strategies for mitigating the adverse effects of flood, to understand the factors affecting the academic performance of students and to come up with proposals that can minimize the impact of floods on school education.

The effects of floods on human capital formation can be determined by measuring the impact it has on academic performances. In this research academic performance was measured based on the marks obtained for three core subjects; Mathematics, Science and Sinhala. Academic performance has also been classified as the 'ability to present knowledge accumulated through an understanding of science'. The marks scored by students on these core subjects in the term before and after the floods were used to determine whether floods indeed have had an impact on academic performance. Moreover, the chi-square test indicated that the employment status of the mother, the time spent on self-studies and athletic performance have had a significant impact on academic performance of students. Moreover, the probability of a drop in academic performance was 45%. Compared to a student who was not affected by floods, this is significant. This also shows the impact of floods in short term. However, the researcher is aware that the long-term impact of floods might be different and can even be more vital. For example, compared to a child whose mother does not work, a child whose mother is employed has a 5.4% chance of having a drop in academic performance. However, if such a child was affected by floods, the probability of that child having a drop in academic performance rises to 93%. The main reason identified is the stress the child undergoes when they are affected by floods and having a mother always with the child makes it easier for the child to cope with the stress. Policies must be put in place to address these issues.

6. References

- i. ADRC. (2015). Annual Report 2014. Available from: <https://www.adrc.asia/publications/annual/14/14eng/index.php> (Accessed 28 December 2015)
- ii. Baez, J. (2010). Do Natural Disasters affect Human Capital? An Assessment Based on Existing Empirical Evidence. [Online]. Available from: <ftp.iza.org/dp5164.pdf> (Accessed 26 September 2011)
- iii. Baez, Javier and Santos, I. (2007). 'Children's Vulnerability to Weather Shocks: A Natural Disaster as a Natural Experiment', working paper.
- iv. Doocy, S., Daniels, A., Murray, S. & Kirsch, T. D. (2010) The Human Impact of Floods: a Historical Review of Events 1980-2009 and Systematic Literature Review. [Online]. Available from: <http://currents.plos.org/disasters/index.html%3Fp=6695.html> (Accessed 20 October 2014)
- v. Disaster Management Center in Sri Lanka. (2009). Terms of References flood Mitigation. [Online]. Available from: www.dmc.gov.lk/.../TOR%20for%20the%20Flood%20study.pdf (Accessed 20 October 2011)
- vi. Jegarasasingam, V. (2010). Sri Lanka Country Report. [Online]. Available from: <https://www.adrc.asia/countryreport/LKA/LKAeng98/index.html> (Accessed 20 October 2015)
- vii. Jonkman, S. N. & Kelman, I. (2005). An analysis of the causes and circumstances of flood disaster deaths. [Online]. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/15720382> (Accessed 20 October 2015)
- viii. Mudavanhu, C. (2014). The impact of flood disasters on child education in Muzarabani District, Zimbabwe. [Online]. Available from: https://www.researchgate.net/publication/280084023_The_impact_of_flood_disasters_on_child_education_in_Muzarabani_District_Zimbabwe (Accessed 17 September 2015)
- ix. Mwape, Y. P. (2009). An Impact of Floods on the Socio-Economic Livelihoods of People: A Case Study of Sikaunzwe Community in Kazungula District of Zambia. [Online]. Available from: [https://www.ufs.ac.za/docs/librariesprovider22/disaster-management-training-and-education-centre-for-africa-\(dimtec\)-documents/dissertations/2261.pdf?sfvrsn=dafdf821_2](https://www.ufs.ac.za/docs/librariesprovider22/disaster-management-training-and-education-centre-for-africa-(dimtec)-documents/dissertations/2261.pdf?sfvrsn=dafdf821_2) (Accessed 17 September 2011)
- x. Noji, E. K. (2000). The public health consequences of disasters. [Online]. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/11227602> (Accessed 22 September 2011)
- xi. Shakil, N. (2010). Poverty, Education and Floods in Pakistan. [Online]. : The Pakistani spectator. Available from: www.pkhope.com/poverty-education-and-floods-in-pakistan/ - Pakistan (Accessed 26 October 2010)
- xii. William, A. A. (2005). Bringing Children into Focus on the Social Science Disaster Research Agenda. [Online]. Available from: <http://ijmed.org/articles/376/download/> (Accessed 22 September 2011)