



Research article

Describing Socio-economic Indicators and Level of Environmental Literacy among Secondary Schools in Iligan City, Lanaodel Norte

Jennifer A. Magdugo¹, Jessie G. Gorospe¹, Richel E. Relox² and Sonnie A. Vedra¹

¹School of Graduate Studies, Mindanao State University at Naawan,
9023 Naawan, Misamis Oriental, Philippines

²College of Arts and Sciences, Mindanao University of Science and Technology,
Cagayan de Oro City, Philippines

E-mail: vedrasonnie@gmail.com



OPEN ACCESS

This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

Abstract

The socioeconomic and behavioral indicators are measures to know the students' level of environmental awareness, sensitivity, and behavior towards understanding environmental issues. As such, this study was conducted among the students in secondary schools of Iligan City, Lanaodel Norte. In-person survey interviews using semi-structured questionnaire were administered to 100 randomly selected respondents. Results showed that students had relatively high level of environmental awareness, possessed good attitudes towards recovery and recycling of materials, and high level of environmental consciousness. Statistical tests showed high significant differences among the students in urban and rural schools that might indicate variations in resolving various environmental issues confronting them. It also showed correlations on the significance of the socio-economic standing parents and their positive response towards environmentalism. Knowledge generated from various environmental issues could be a measure to indicate willingness to learn among the secondary students. **Copyright © WJER, all rights reserved.**

Keywords: environmental literacy, environmental awareness, attitude, secondary schools



Introduction

Today, human activities whether at the individual, corporate, governmental, and societal levels pose harm to the environment and affect the well-being of all living species (Ugulu and Erkol 2013; Gore 1993; Manfreda and Caylor, 2013). Individuals with negative attitudes towards the environment will continue to pose problems to the environment at present and future condition (Uzun and Saglam, 2006). With this, we will soon live in an unsustainable planet and unhealthy environment.

Environmental education is a long-term process of developing skills and behavior of the students necessary to understand and accept the relationships between people, culture and the natural environment. In addition, environmental education is a sequential process that attempts to increase understanding of the environment and promote pro-environmental values. Its ultimate aim is to motivate citizens to act individually and collectively in an environmentally conscious manner that balances the social, economic, and ecological needs of today without compromising those of the future (Hungerford et al. 1980; Yorek et al. 2010). It is a means to prepare society in practical decision making and to teach environmentally friendly behavior. It should, therefore, be a fundamental and integral part of education for all members of society. Environmental education syllabuses at all educational levels (both formal and informal) should be prepared to help achieve these aims (Grodzinska-Jurczak et al. 2006). In Ghana, for instance, the associations between land contamination to several socio-demographic factors (i.e. population, population density, unemployment, education, and literacy) shows positive correlation (Dowling et al., 2015). In addition, environmental knowledge affect individual environmental attitudes (Agusalim, Dirawan, Sauf, 2014).

Promoting sustainability and dealing with complex environmental problems like climate change demand a citizenry with considerable scientific and quantitative literacy (McCright, 2012; Manfreda and Caylor, 2013). Accordingly, the issue of climate change among young students in K to 12 may be an important antecedent to behavior which does not dampen the positive impacts of hope. In the same way, efforts to build climate change concern to overcome apathy and promote action among students will lead them to pro-environmental activities. In addition, mitigating the negative effects of climate change among young age children will give hope resulting to independent predecessor if their behavior (Stevenson and Peterson, 2015).

As the number of urban consumers and their material expectations rise and as the use of fossil fuels increases, cities contribute to the large-scale pressures on the biosphere including climate change (McMichae, 2000). Society is facing growing environmental problems that require new research efforts to understand the way ecosystems operate and survive, and their mutual relationships with the hydrologic cycle. In this respect, ecohydrology suggests a renewed interdisciplinary approach that aims to provide a better comprehension of the effects of climatic changes on terrestrial ecosystems. This implies, under some specific conditions which depend on the ecosystem characteristics, small changes in climatic conditions may produce significant transformation of the vegetation patterns (Manfreda and Caylor, 2013). In the same way, the preservation of environmental diversity is necessary for the regulation of the hydrological cycle and biogeochemical cycles of carbon and nitrogen, flood protection, the availability of genetic diversity in agriculture, the natural pollination and the stability of ecosystems (Duffy and Stachowicz, 2006). In addition, water environment and aquatic ecology, urban landscape and food ecological construction, such as quantity, quality and capacity problems in ecological food environment construction, analyses the cause of the problems and puts forward the scientific understanding of the connotation of urban food ecological environment construction, raises awareness of the environment protection of city management and urban planning and technical personnel's professional quality, strengthening the construction of urban ecological engineering and urban sustainable development system of several countermeasures (Li, 2014)

Environmental problems continue to increase, hence, environmental education has become more and more important. The goal of environmental education is to train environmentally literate individuals who are aware of and sensitive to environmental problems and try to solve these problems (Aslan, 2015). In the same manner, environmental problems, affecting the future of all living things, are connected with the incorrect relations between man and nature. People have become alienated from nature seeing it as an endless source and as a result nature has become a tool for achieving anthropocentric objectives. It can be said that such an anthropocentric view is the real cause of environmental problems, but human and nature harmony should be structured immediately because environmental problems have reached to serious position. Consequently, human being is a living creature and he needs healthy and reliable environment to live like all other creatures. Unless changing anthropocentric view of people towards nature, law and fines will also be helpless. At this point, education plays a very important mission. Because it is possible to change people's behavior and perspectives positively through education. For the creation of



awareness about the importance of protecting environment in society, faculties of education as teacher training institutions are of great importance.

Teachers, preparing generations for future and so shaping the future of a society, receive their professional qualification and requirements for becoming a teacher from faculties of education, so teacher candidates should be educated very well. Teacher candidates from all disciplines, educated with environmental consciousness, will be able to transfer this consciousness to their students when they graduate. Generations, given the love of nature at an early age by their teachers, can be eco-friendly individuals in the future and shed light on environmental problems. This theoretical study aims to put forward the role of faculties of education in increasing sustainable environmental awareness of society (Karatas, 2013)

Many of these studies are particularly concerned about young people's environmentally sensitive attitudes, because young people will be affected by and need to provide solutions to environmental problems as a result of present-day actions (Bradley et al., 1999). Consequently promoting environmental attitudes has been considered as an important part of environmental education as suggested in the respective international conventions and charters (Sarkar, 2011). Similarly, a measure of low socioeconomic status in schools were less likely to engage in pro-environmental behaviors, suggesting climate literacy efforts should target schools with lower levels of socioeconomic status (Stevenson and Peterson, 2015). In India, for instance, slum areas proved the effect of socio-economic and the environmental factors affecting health status of urban poor and degrade the environment (Siddaling, 2015).

One purpose in developing environmental literacy is to empower people with a belief in their ability to contribute to environmental solutions through personal behavior, either as an individual or part of a group (Peer et al. 2007; Mondéjar-Jiménez 2012; Hagood, 2013). With this, the ultimate goal of environmental education is acquisition of responsible environmental behavior (REB). Actions done in order to reflect REB have been observed in various literature that acquire participation of citizens within and across community (Hsu and Roth 1999; Hsu, 2004; Ramsey et al., 1981; Sia et al., 1986; Smith-Sebasto and D'Costa, 1995). Accordingly, environmental education programs intending to encourage pro-environmental attitudes and behaviors and to develop a personal ecological knowledge base among participants should offer a variety of techniques and characteristics within various sequential stages (Farmer et al. 2007). Similarly, within the general public, promoting sustainability and dealing with pressing environmental problems is likely to be more effective with a citizenry that is scientifically and quantitatively literate and supportive of the interdisciplinary work necessary to address and understand complex problems as well as support their solutions (McCright, 2012). With this, a sustainable well-being individual is possible to achieve with the fundamental overarching skill for sustainability is the ability to work constructively with others in building more sustainable communities, businesses and societies. (Ansari and Stibbe, 2009).

One of the strategies to make individual become aware of global warming and other environmental issues such as energy and resource constraint Information Technology (IT) which was perceived as an enabler to resolve those problems and bring greater efficiency in energy conservation. Many countries have already applied Green IT initiatives to reduce carbon emissions. However, there is still a lack of implementation and action dimensions of the issue (Widjaja et al., 2011). In the Philippines, for instance, climate change adversely brings about uncontrollable and unpredictable natural calamities. Thus, it is deemed necessary to assess students' environmental knowledge, concern and disaster preparedness to help them adapt or mitigate environmental problems (Contreras, 2014). This was supported in a study conducted in Higher Education Institution using Green IT in their teaching and learning activities to address recent environmental issues and problems the world face (Kartiwi, et al., 2014). Scientific and environmental literacy are cornerstones of science education reform and twenty first century citizenry. The ability to make decisions about socio-scientific issues is a characteristic of scientific and environmental literacy. Findings, indicate that pre-service science teachers do not consistently use the dimensions of the Sustainability Triad as they analyze socio-scientific issues, and make decisions that are not sustainable. Recommendations for science teacher preparation programs that emphasize sustainability considerations are provided (Dani, 2011). Similarly, the use of rich classroom talk, students can be motivated to take a critical stance on issues of citizenship, such as social justice, equity and environmental concern. Suggesting that students who are not part of the solution are, indeed, part of the problem, giving young children a voice through the integration of citizenship education and critical literacy across the curriculum to promote student awareness and to empower students to become pro-active global citizens (Vetter, 2008).

To determine the socio-economic indicators affecting the respondents' level to explore environmental issues of the students in public secondary schools particularly, on the respondent's views of environmental awareness, and behavior towards environment and knowledge and understanding of environmental issues, other



fields related to environment and the environment philosophy of environmental education with indication of willingness to learn from several sources of environmental knowledge.

Materials and Methods

Respondents were the students of public urban and rural secondary schools in the Division of Iligan City and chosen by random sampling. During visitation phase, the respondents were selected by draw lots technique wherein their individual names were written on a sheet of paper, rolled and placed in the box and labelled as students. The box was shaken well to avoid the settling down of some of the papers. Twenty-five (25) names were picked from the labelled box which then became the respondents of the corresponding school. Due to constraints of time, costs and distance from site to site, only twenty-five (25) respondents were taken from each school. The whole process was done in all sampling schools. Thus, a total of one hundred (100) respondents were obtained.

A survey questionnaire was prepared and used in the study, which focused on socio-economic profile of the respondents and views on the behavioral indicators affecting respondents' level to explore environmental issues in term of respondents' environmental awareness, behavior towards environment and knowledge and understanding of environmental issues, other fields related to environment and the environment philosophy of environmental education with indication of willingness to learn from several sources of environmental knowledge. Data obtained was then analyzed through Kruskal-Wallis test.

Results and Discussions

A. Socio-demographic profile of the respondents

Age

The respondents were the 50 students in urban and 50 students in rural secondary schools. The garnered percentages for ages from the urban respondents, the highest percentage rating was 50% for the age bracket 14-15 years old, followed by 28% for the 16-17 years old, 18% for the 12-13 years old, and 4% for the 18-20 years old, while none of the respondents fell into the age bracket of 21 years old and above. As for the rural respondents, the garnered percentage for ages with the highest rating was 36% for the age bracket 14-15 years old, followed by 32% for the 12-13 years old, 30% for the 16-17 years old and 2% for the 18-20 years old, while none of the respondents fell into the age bracket of 21 years old and above (Figure 1).

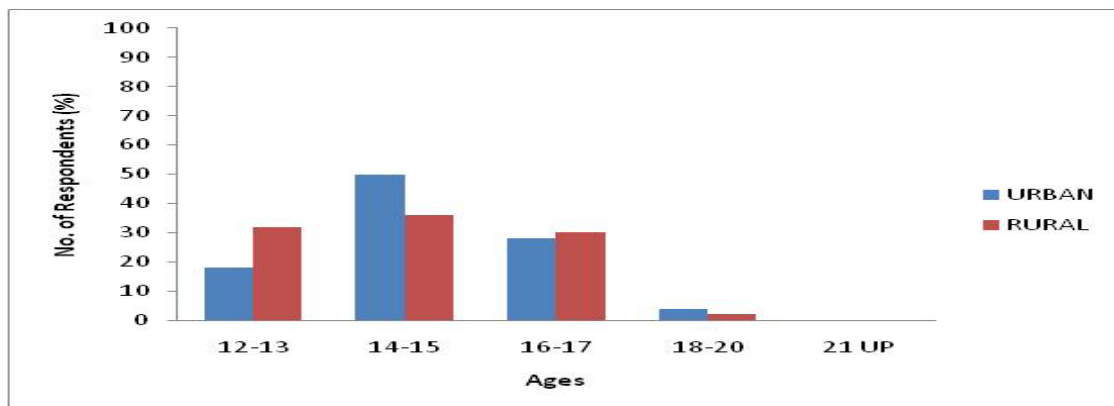


Figure 1. Percentage distribution of respondents' ages in urban and rural secondary schools.

Gender

As shown in the graph there were equal percentages of both male and female respondents in urban secondary schools. While there were more female respondents than male respondents in the rural secondary schools. The female respondents had a percentage of 60% and male respondents had 40% (Figure 2).

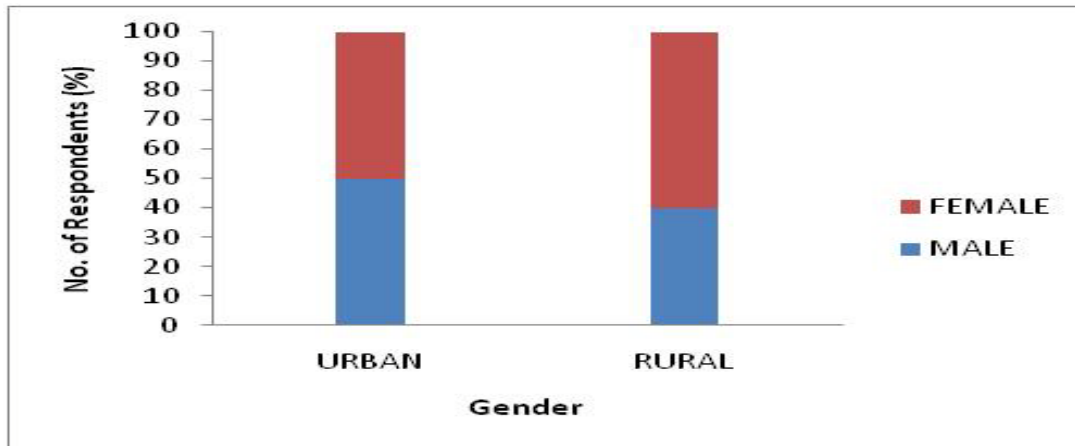


Figure 2. Percentage distribution of respondents' gender in urban and rural secondary schools.

Family Size

Small family size with less than 5 members (62%) and medium family size with 6-8 members (34%) were more common in the rural respondents than in urban respondents. While the large family size with more than 8 members (10%) were more common in the urban respondents than in rural respondents. The proportion of small family size and medium family size was larger in the rural respondents than in the urban respondents. The proportion of large family size was larger than in the urban respondents than in the rural respondents (Figure 3).

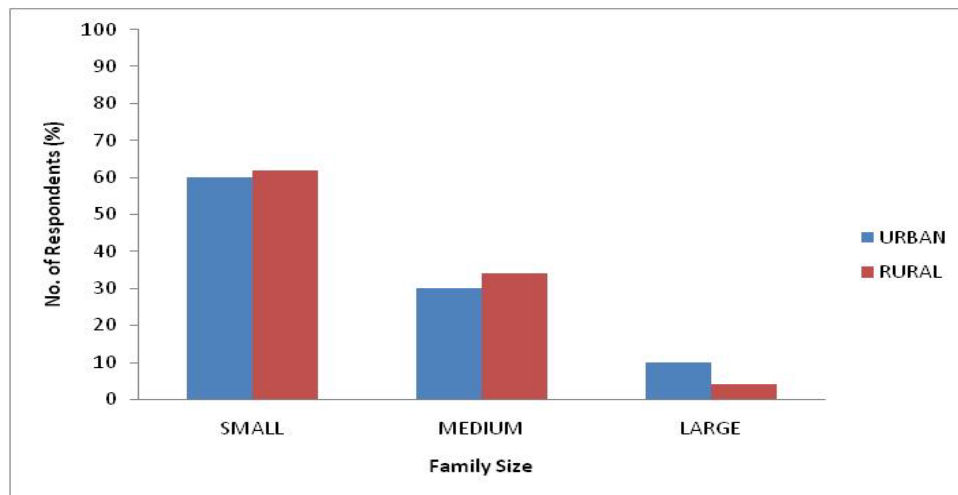


Figure 3. Percentage distribution of respondents' family size in urban high schools.

Grade Level

Among the respondents in the urban secondary schools, Grade 8 level had the highest percentage of 32%, followed by 26% for the Grade 10 level, 22% for the Grade 7 level and 20% for the Grade 9 level. As for the rural respondents, majority were in the Grade 10 level with a percentage of 32%, followed by 24% for the Grade 9 level and the same percentage (22%) for the respondents in the Grade 7 and Grade 8 levels (Figure 4).

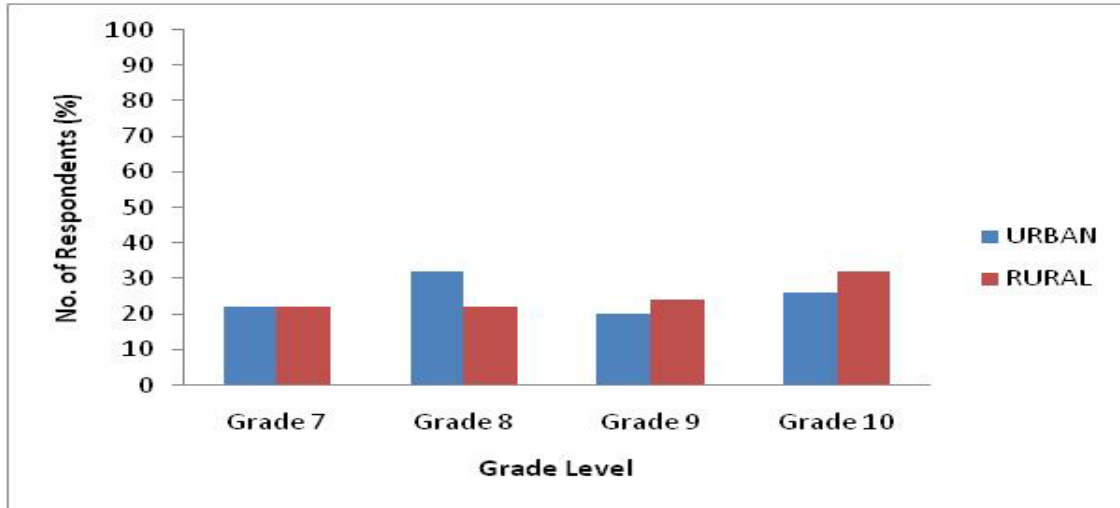


Figure 4. Percentage distribution of respondents' grade level in urban and rural secondary schools.

Occupation

In terms of occupation in the urban respondents, the highest percentage rating is 24% which is carpenter, followed by 16% for both farmer and driver, 12% for both laborer and self-employed, the same percentage rating for fisherman and those parents who work in the government and private agencies. As for the occupation in the rural respondents, farmer had the highest percentage rating which is 32%, followed by 22% for those parents who work in the government and private agencies, 20% for self-employed, 12% for carpenter, 8% for driver, 6% for laborer and none of their parents' occupation fall into fisherman and professional (Figure 5).

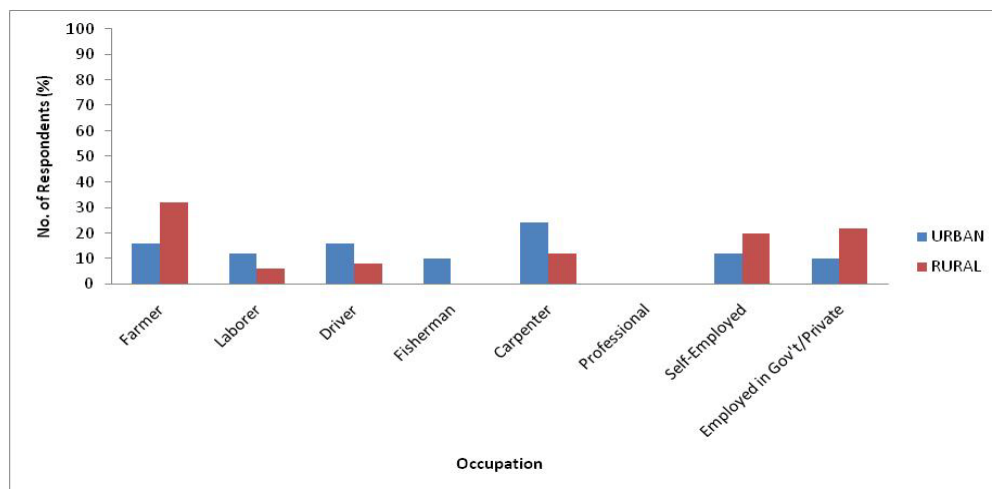


Figure 5. Percentage distribution of the occupation of respondents' parents in urban secondary schools.

Monthly Income

In terms of monthly income of the respondents' parents in urban secondary school, the highest percentage rating is 58% for a monthly income below 5000, followed by 26% for 5001-10000 monthly income, 10% for 10001-15000 monthly income, 4% for 15001-20000 monthly income and 2% for 25001-30000 monthly income. As for the rural respondents' parents, below 5000 monthly income had the highest percentage rating which is 62%, followed by



26% for 5001-10000 monthly income, 12% for 10001-15000 monthly income and none of their parents had an income fall into 15000 and above monthly income.

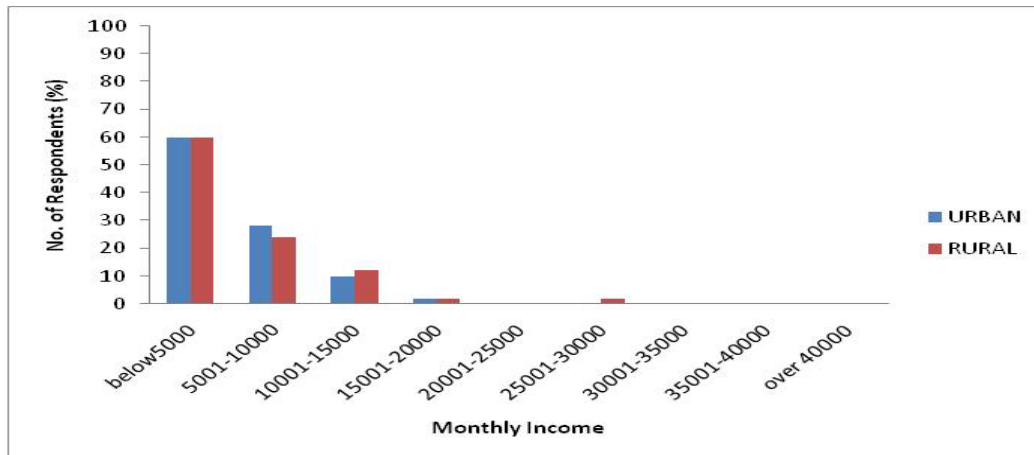


Figure 6. Percentage distribution of the monthly income of respondents' parents in urban and rural secondary schools.

B. Environmental Literacy

Environmental Awareness

In terms of environmental awareness both students (male and female) exhibited significant differences using Kruskal-Wallis test, that is P value is 0.0002. This means that all respondents are fully aware of several environmental issues confronting them. There are many socioeconomic factors that affect student's environmental awareness. It is concluded that level of environmental awareness was higher in students whose parents are employed and having low income. Results showed that male students exhibit more pro- environmental behavior than female students. While making comparison between urban and rural students of public secondary schools regarding environmental awareness, that is T value is 21.78 and P value is 0.0002 (Table 1) it was found that there exists significant difference. The students in urban public schools were more environmentally aware compared to the students in the rural secondary schools. Therefore, it might conclude that there is significant difference in environmental awareness among the students in urban and rural public secondary schools.

Attitudes towards Recovery

In terms of their attitudes towards recovery, both students (male and female) exhibited significant differences using Kruskal-Wallis test, that is P value is 0.00006 (Table 1) This means that all respondents have good/positive attitude given the environmental issues confronting them. Statistical results explained that overall students from both urban and rural public secondary schools expressed favorable environmental attitudes towards recovery with female students having a significantly higher level of favorable environmental attitudes than male students; in particular, rural female students had the highest level of environmental attitude towards recovery comparing others. It was also found that students in the urban public schools showed favorable environmental attitudes towards recovery. Therefore, it might conclude that there is a significant difference in attitudes towards recovery among the students in urban and rural public secondary schools.

Attitudes towards Recycling

In terms of their attitudes towards recycling, both students (male and female) exhibited significant differences using Kruskal-Wallis test, that is P value is 0.001 (Table 1). This means that all respondents have good/positive attitude towards recycling given the environmental issues confronting them. Referring to table 3, it was found that



female students had a more significant favorable environmental attitude towards recycling than male students. Urban residents are more likely to be concerned about the environment and act on this concern. These differences have been attributed to rural residents having lower education levels, lower income, and a more utilitarian value orientation (Jones et al., 2003). In contrast urban residents are more likely to have higher levels of education and income as well as exposure to higher levels of environmental degradation, such as pollution, resulting in values, beliefs and attitudes that are more amenable to environmental protection (Saphores et al.; Van Lierre and Dunlap 1980). The narrowing gap between urban and rural differences has been partially explained by the availability of community environmental services, such as recycling are more readily available in the urban settings (Derkson and Gartrell 1993; Saphores et al. 2006). Therefore, it may conclude that there is a significant difference in attitudes towards recycling among the students in urban and rural public secondary schools.

Environmental Consciousness and Behavior

In terms of their consciousness and behavior, both students (male and female) exhibited significant differences using Kruskal-Wallis test, that is P value is 0.001 (Table 1). This means that all respondents have good/positive attitude towards recycling given the environmental issues confronting them. It was found in the statistical results that female students were more environmentally conscious and expressed favorable environmental behavior than male students. There has been a slight but consistent demonstration in recent research that women are more environmentally concerned than men (Brown and Switzer, 1991; Gifford, Hay and Boros, 1982). Students in the rural public secondary schools were more environmentally conscious and expressed favorable environmental behavior than in the urban public secondary students. Therefore, it may conclude that there is a significant difference in environmental consciousness and behavior among the students in urban and rural public secondary schools.

Table 1. Source of variation of urban and rural.

Source of variation:urban vs. rural students	T value	P value
environmental awareness	21.78	0.0002
attitude towards recovery	29.16	0.0006
attitude towards recycling	16.91	0.0001
environmental consciousness and behavior	12.31	0.0151

*Note. *P value is significant at 0.05 significance level*

Summary and Conclusions

This study tried to determine public secondary students' environmental literacy. The effects of gender, students' grade level, students' family size, parents' work status, parents' monthly income and views about environmental awareness, behavior towards environment, knowledge and understanding environmental issues in the urban and rural secondary public schools. Correlation between students' actual knowledge and their self-assessment of environmental knowledge were also examined.

Findings revealed that in terms of environmental awareness, attitudes towards recovery, attitudes towards recycling, environmental consciousness and behavior among the students in the urban and rural public secondary schools exhibited significant difference. This means that all respondents are aware of several environmental issues and they showed positive attitudes toward the environment as well as having high degrees of concern about environmental problems. It also showed that there was statistically significant effect of parents' working status and income regarded as an important indicator of socio-economic status are more knowledgeable about environment.

Implications and Recommendations

Environmental literacy among public secondary students for both urban and rural should be developed to protect and conserve the environment and it is a great help in solving environmental problems. Environmental education should be emphasized in all learning areas in secondary schools, teachers play a very significant role as well as the educational planners and educational administrators in developing environmental awareness particularly,



on the respondent's views of environmental awareness, sensitivity, and behavior towards environment and knowledge and understanding of environmental issues. This would improve student's views, awareness and concern in the environment.

Acknowledgments

Sincere thanks and appreciation were gratefully acknowledged to the school administrators of the four public schools in Iligan City, the teachers and staff, the student respondents, the stakeholders, and others who were not mentioned but provided much help in conducting this study.

References

- [1] Ansari, W. and A. Stibbe. 2009. Public Health and the Environment: What Skills for Sustainability Literacy – And Why? *Sustainability*. 1 (2): 425-440.
- [2] Agussalim, G.D.D. and B.F. Mulyadi, Bakhrani Rauf. 2014. The Ecological Behavior of Community in Preserving Land Use in Coastal Areas of Parepare. *Journal of Environmental Science and Technology*. 2014; 7(4):218-225
- [3] Aslan, E. H. (2015). Animasyon Destekli Çevre Eğitiminin Akademik Başarıya, Akılda Kalıcılığa ve Çevreye Yönelik Tutuma Etkisi. *Journal of Computer and Education Research*, 3 (5): 120-133.
- [4] Bradley, J. C., Waliczek, T. M., & Zajicek, J. M. (1999). Relationship between environmental knowledge and environmental attitude of high school students. *The Journal of Environmental Education*. 30(3):17-21.
- [5] Contreras, R. C. 2014. Assessment of Environmental Literacy, Concern and Disaster Preparedness among College Students. *Asia Pacific Journal of Multidisciplinary Research*. 2(3): 1-11.
- [6] Dani, D. E. 2011. Sustainability as a Framework for Analyzing Socioscientific Issues. *International Electronic Journal of Environmental Education*. 1(2):113-128.
- [7] Derkson, L. and J. Gartrell. 1993. "The social context of recycling." *American Sociological Review* 58:434–442.
- [8] Dowling, R., Ericson, B., Caravanos, J., Grigsby, P., and Y. Amoyaw-Osei. 2015. Spatial associations Between Contaminated Land and Socio Demographics in Ghana. *Int. J. Environ. Res. Public Health*. 1(12):13587-13601
- [9] Duffy, J.E. and J.J. Stachowicz. 2006. Why biodiversity is important to oceanography, potential roles of genetic, species, and trophic diversity in pelagic ecosystem processes. *Mar. Ecol. Progr. Ser.* 311 (1): 179–189.
- [10] Gore, A. 1993. *Earth in the Balance: Ecology and the Human Spirit*. Boston: Houghton-Mifflin. Grodzinska-Jurczak M, Stepska A, Katarzyna N, Bryda G 2006. Perception of environmental problems among preschool children in Poland. *Int Res Geogr Environ Educ*, 15(1): 62-76
- [11] Hagood, A. 2013. Wonders with the Sea: Rachel Carson's Ecological Aesthetic and the Mid-Century Reader. *Environmental Humanities*. 2(1): 57-77
- [12] Hungerford HR, Peyton RB, Wilke R 1980. Goals for curriculum development in environmental education. *J Environ Educ*, 11(3): 42–47.
- [13] Hsu, S. J. and Roth, R. E. 1999. Predicting Taiwanese secondary teachers' responsible environmental behavior through environmental literacy variables. *Journal of Environmental Education*, 30 (4):-18.



- [14] Hsu, S. J. 2004. The effects of an environmental education program on responsible environmental behavior and associated environmental literacy variables in Taiwanese college students. *Journal of Environmental Education*, 35 (2):37-48.
- [15] Jones, R.E., M.J. Fly, J. Talley, and H.K. Cordell. 2003. "Green migration into rural America: The new frontier of environmentalism?" *Society and Natural Resources* 16:221–238.
- [16] Karatas, A. 2013. The Role of Faculties of Education in Increasing Sustainable Environmental Awareness of Society. *European Journal of Sustainable Development*.2(4):233-242
- [17] Kartiwi, M., Hasan,H., Gunawan, T.S., and B. Husein. 2014. Green IT attitude and behavior in Higher Education Institution: A gender perspective. *J. Applied Sci.* 14(7): 714-718.
- [18] Knapp, D. 2000. The Thessaloniki Declaration: A wake-up call for environmental education? *Journal of Environmental Education*, 31 (3):32-39.
- [19] Manfreda, S., and K. Caylor.2013. On the Vulnerability of Water Limited Ecosystems to Climate Change. *Water*. 5(1): 819-833; doi: 10.3390/w5020819
- [20] McCright. A.M. 2012. Enhancing students' scientific and quantitative literacies through an inquiry-based learning project on climate change. *Journal of the Scholarship of Teaching and Learning*. 12 (4):86 – 102.
- [21] McMichael, A.J.2000. The urban environment and health in a world of increasing globalization: issues for developing countries. *Bulletin of the World Health Organization*. 78 (9): 1117- 1126
- [22] Mondéjar-Jiménez J, Mondéjar-Jiménez JA, Vargas-Vargas M, Gázquez-Abad JC 2012. Personal attitudes in environmental protection. *Int J Environ Res*. 6(4): 1039-1044.
- [23] Peer S, Goldman D, Yavetz B 2007. Environmental literacy in teacher training: Attitudes, knowledge, and environmental behavior of beginning students. *J Environ Educ*, 39(1): 45-59.
- [24] Ramsey, J., Hungerford, H. R. and Tomera, A. N. 1981. The effects of environmental action and environmental case study instruction on the overt environmental behavior of eighth-grade students. *Journal of Environmental Education*, 13 (1):24-29.
- [25] Saphores, J.M., H. Nixon, O. Ogunseitan, and A. Shapiro. 2006. "Household willingness to recycle electronic waste: An application to California." *Environment and Behavior* 38:183–208.
- [26] Sia, A. P., Harold, R.H. and. Tomera A. N. 1986. Selected predictors of responsible environmental behavior: An analysis. *Journal of Environmental Education*, 17(2), 31-40.
- [27] Siddaling, R. 2015. Issues and challenges of slum children in India: A sociological observation. *Indian Streams Research Journal*. 5(7):1-6.
- [28] Smith-Sebasto, N.J. and D'Costa, A. 1995. Designing a Likert-type scale to predict environmentally responsible behavior in undergraduate students: A multiple process. *Journal of Environmental Education*, 27(1):14-20.
- [29] Stevenson, K., and N. Peterson. 2015. Motivating Action through Fostering Climate Change Hope and Concern and Avoiding Despair among Adolescents. *Sustainability*. 8(6):1-10
- [30] The world health report 1995. Bridging the gaps. Geneva, World Health Organization, 1995
- [31] Ugulu I, Erkol S 2013. Environmental attitudes of biology teacher candidates and the assessments in terms of some variables. *NWSA-Education Sciences*, 8(1): 79-89.



- [32] Uzun N, Saglam N 2006. Ortaöðretimogrencileriicincevreseltutumolcegelistirmevegecerliligi. HacettepeUnivEgitFakDerg. 30(1):240-250.
- [33] Van Liere, K.D. and R.E. Dunlap. 1980. “The social bases of environmental concern: A review of hypotheses, explanations and empirical evidence.” Public Opinion Quarterly 44:181–197.
- [34] Vetter, D.M. 2008.Toward a Critical Stance: Citizenship Education in the ClassroomBrock Education: a Journal of Educational Research and Practice. 2008; 17(1):87-94
- [35] Widjaja,N.D., Mariani, M., and I. Karen. 2011.IT Professionals Awareness: Green IT International Comparison Study. Communications of the IBIMA. 2011; 2011(534852):1-15
- [36] Yorek N, Ugulu I, Sahin M, DoganY 2010. A qualitative investigation of students’ understanding about ecosystem and its components. NaturaMontenegrina, 9(3):973-981.