



**Mainstreaming Environment to the Curriculum: Analysis of Knowledge and Attitudes of College Students and the Schools Activity**

by  
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## **Mainstreaming Environment to the Curriculum: Analysis of Knowledge and Attitudes of College Students and the Schools Activity**

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### **Abstract**

One of the cardinal goals of education is to unravel societal problems. In Ethiopia, challenges aroused from environmental negligence are partly responsible to the downward spiraling of poverty, food insecurity, drought, health crisis, etc. The merit of mainstreaming Ethiopian education system to local environmental management is indisputable, where geography is one of the realistic channels. This study was undertaken (1) to assess the factual knowledge, awareness and attitudes of college students towards local and regional environment; (2) to evaluate the field orientedness of environmental topics in colleges and schools, and (3) to identify the prevailing gaps and opportunities to mainstream environmental education to our future leaders and scientists.

Questionnaires were distributed to 100 randomly selected senior diploma students of Geography stream in Kotebe (public) College of Teachers' Education and St. Mary's (private) College. The survey enabled to capture the academic, socioeconomic, and perceptual parameters needed for the study. Analysis was made through ANOVA to compare parameters along gender, program (regular vs. extension) and College (Kotebe vs. St Mary's) categories. Correspondingly, five Junior Secondary Schools of Addis Ababa, randomly chosen from Lideta Sub city, were involved in the assessment of the practical activities of environmental topics and activities through interviews and informal discussions.

The obtained results demonstrated significant differences (of environmental knowledge, opinion and attitude) between gender, program and college types. Environmental Education has withered in curriculum as well as physical space. Compared to responses obtained from students of the new curriculum, responses from old curriculum showed better literacy of the environment. Colleges and surveyed schools have overlooked their immediate environmental resources. Such a gap indubitably enables to make targeted interventions. It is recommended that a range of actions which ranges from curriculum modification to the expansion and strengthening of environmental clubs, massive awareness creation in school community, and exploitation of local environmental resources for environmental education.

### **1. Background and the Problem**

Ethiopia is confronted with human crisis beyond imagination. The environment is continuously delving into unfathomable depths of despair and hopelessness. It is tragically and glaringly manifested in the hardships of the people, which are mainly caused by inappropriate and

unsustainable exploitation of environment through massive loss of biomass cover, soil erosion, climatic change, creeping desertification, and increasing susceptibility to health hazard.

According to the State of Environment Report for Ethiopia (EPA, 2003) and the Environmental Policy (EPA, 1997), the Ethiopian environment is lingering in a precarious condition. Estimates of deforestation, mainly for agricultural expansion, are in the range of 80,000 to 200,000 hectares per annum. Burning of dung as fuel is responsible to a reduction of grain production by 50,000 tones annually, and estimated to reach 170,000 tones by 2010. Soil loss is estimated in the range of 42 tones/ha/annum in cultivated lands to 400 tones/ha/annum in abandoned lands. The genetic diversity of the flora and fauna is diminishing at a faster rate of extinction.

Both human and livestock population growth, which are the underlying factors of environmental degradation, are exerting disproportionate pressure on the delicate balance of the environment. The current urban population accounts for 15% of the total population, but growing at a faster rate (~5.4%) than the rate of economic growth. On the contrary, urban housing is not only insufficient but also poor in quality. Various researchers have documented the poor environmental conditions of Addis Ababa (Dierig, 1999; Girma, 2004). For instance, 33% of households in Addis Ababa have no sanitation facilities. There are shortages or non existence of sewerage systems, unavailability or mismanagement of toilets, solid waste and industrial effluent disposal problems, and air pollution. Rivers and streams in and around Addis Ababa are open sewers and are main sources of infections resulting in diarrhea and other diseases.

These cobwebs of environmental problems, both at national and city levels are worsening and intensifying by the years. Such deteriorating environmental conditions are caused by several factors among which lack of environmental awareness at different level of the society is the hallmarks of the issue.

The cardinal goal of any educational system is to unravel the pressing problem of the society. Currently, the multifarious problems induced from environmental mismanagement are a prime concern of the Ethiopian people. These problems which need to be tackled urgently and wisely. Geography is the leading subject which is effectively armed with the necessary tools and resources for efficient and sustainable management of the threatened environment.

Environmental education<sup>1</sup> refers to curriculum and programs which aim to teach people about the natural world and particularly about ways in which ecosystems work. It often aims to change people's perceptions about the value of the natural world and to teach how to change environmental behaviors.

In principle, environmental education involves everyone, as it is the responsibility of everyone: government, industry, the media, educational institutions, community groups as well as individuals. As information about environmental problems is always improving, environmental education is a lifelong process. Environmental education is holistic and deals with connections. Therefore, specialist discipline-based knowledge is no longer adequate by itself. One of the most fundamental defining characteristics of effective environmental education is that it leads to actions which result in better environmental outcomes. This is ultimately the yardstick by which the effectiveness of our efforts in environmental education is measured. Besides, environmental education is compatible with social and economic goals.

In the process of tackling environmental problems, formal, informal and non formal educations play paramount roles. For instance, environmental clubs create and develop awareness on the inter-relationship and inter-dependence between people and the environment. Through clubs, the youth could be engaged in community-based activities aimed at conserving and developing natural environment. With respect to this, a civic association called Environment and Development Society of Ethiopia (LEM) is trying to promote such environmental clubs in schools. So far, the obtained impact is rather negligible compared to the magnitude of its potential.

Experiences in India<sup>2</sup> show that variety of measures could be undertaken in schools. For instance, there are “eco clubs”, which conduct activities related to water conservation. There are environmental examinations called GREEN Olympiad, which are intended for middle and senior level school students where winners at higher rank receive scholarships. A quiz program called “terraquiz”, on environmental issues is telecast on national television. There is “Enviro-Club”, which initiated Internet-based environment clubs. There are also BEACON (Building Energy Awareness on Conservation); PACCIFY (Program for Awareness on Climate Change Issues Featuring the Youth);

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<sup>1</sup> Source: <http://www.wilderdom.com/environment/EnvironmentalEducation.html>

<sup>2</sup> Source: [www.terin.org/case/retreat.htm](http://www.terin.org/case/retreat.htm)

SWISS (Sensitization on Water Issues for School Students); National Green Corps (a movement of environment friendly children), Air quality monitoring and awareness building programs, etc.

Fieldwork is particularly valuable through its potential for group work and the development of leadership and organizational skills (Wheater and Dunleavy, 1995; Kneale, 1996). Wiley and Humphreys (1985) and Kern and Carpenter (1986) claim that abstract topics and higher-level concepts are easier to teach in the field than in class. McElroy (1981) and Haigh (1986) substantiate the idea by stating that fieldwork enables students to connect theory with real experience.

Lonergan and Andresen (1988) define the “field” as any place where supervised learning can take place via first-hand experience. Field studies provide the opportunity to experiment with a wide variety of different modes of course delivery and have a valuable role as a vehicle for the integration of many theoretical and practical concepts taught in geography (Kern and Carpenter, 1984, 1986; Lonergan and Andreson, 1988; McEwen, 1996). Kent et al. (1997) stresses the need for carefully integrated preparation of project-orientated fieldwork and emphasizes the importance of debriefing and feedback after field visits. Field experience is also seen as vital tool for the development of students as qualified practitioners in all aspects of geography. The main purpose of outdoor education is to provide meaningful contextual experiences, both in natural and constructed environments, which complement and expand classroom instruction (Knapp, 1996).

It goes with out saying that the cause for many environmental problems is mainly due to irresponsible environmental behavior. One of the most important influences on behavior is attitude (Ramsey and Rickson, 1976). Young people's environmental attitudes are particularly important because they are ultimately affected by environmental problems arising from present-day actions. As future scientists, policymakers, consumers, and voters, today's youth will be responsible for "fixing" the environment, and they will be the ones who must be persuaded to adopt and pay the costs of future environmental policies. Therefore, effective environmental education for school age students is crucial. In general, young people's attitudes toward the environment begin to develop at very early age (Bryant and Hungerford, 1977).

Fishbein and Ajzen (1975) define attitude as "a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object". Hence, environmental attitude can be defined as "a learned predisposition to respond consistently favorable or unfavorable manner with respect" to the environment. There are many scales available to measure aspects of people's attitudes toward the environment, i.e., attitudes toward wildlife, pollution, habitat, etc. Understanding and measuring environmental attitudes has become increasingly important as the number of environmental conflicts have increased throughout the world.

It is commonly assumed that increased knowledge about the environment promotes positive attitudes (Arcury, 1990). Junior high and high school students exposed to environmental courses demonstrated an increase in responsible environmental behavior and an increased awareness of environmental issues (Ramsey, 1993; Ramsey and Rickson, 1976).

Key resource priorities identified by the World Summit on Sustainable Development include: water, energy, housing, agriculture and biodiversity, which came to be known at Johannesburg. 'Environmental literacy' depends upon such understandings, which is central to developing the capacity for such learning. It also entails the capacity to identify root causes of threats to sustainable development. Issues of development, environment, and health are closely entwined, reflecting the complex links between the social, economic, ecological and political factors that determine standards of living and other aspects of social well-being that influence human health.

Nowadays, cities have moved to the forefront of global socio-economic change, with half of the world's population now living in urban areas and the other half increasingly dependent upon cities for their economic, social and political progress. Accordingly, it is generally accepted that cities not only pose potential threats to sustainable development but also hold promising opportunities for social and economic advancement and for environmental improvements at local, national, and global levels.

In Ethiopia, studies dealing with environmental education are poorly addressed. In fact, there are ample studies which focused on the various aspects of education. On the other hand, there are equally numerous environmental oriented studies from the non-pedagogical perspective. However, there are very little attempts to link educational aspect with the environment in Ethiopia. The exception is the

report of Aklilu (2002), which addressed the educator's perspective on the protection of natural vegetation, where the educational curriculum, the college environment and the potential of environment-related teaching in the school is not addressed.

According to EPA (2003), one of the causes for deep rooted environmental problems in Ethiopia has been the lack of environmental awareness especially at the level of decision makers. Gedeon (2003) has noted that the Ethiopian environmental condition would rehabilitate if and only if the issue is taken up by school curriculum. While environmental education is a prerequisite to achieving sustainable development in Ethiopia (Kifle, 1995), it has been incorporated into elementary education curriculum, grades 1 to 4, and efforts are being made to do the same in the higher grades curriculum (EPA, 2003).

## **2. Objectives of the Study**

- (1) to assess the factual knowledge, awareness and attitudes of college students towards field-oriented environmental issue;
- (2) to evaluate the practical inclination of environmental topics in colleges and schools, and
- (3) to identify the prevailing gaps and opportunities to mainstream environmental literacy to our future leaders and scientists.

## **3. Research Methodology**

Two data collection methods, viz., questionnaire survey and case study were employed in the study. For the questionnaire survey, Kotebe College of Teachers Education (KCTE) and St. Mary's College (SMC) were considered. They were chosen based on their pioneer engagement in the training of pre-service teachers in Ethiopia, representing public and private groups, respectively. Candidates who majored in Geography (*its former name*) and Social Studies (*its recent name*) were randomly chosen from the respective colleges. About 100 structured questionnaires were distributed to senior students while they are in the classroom. The return rate was 88%. An attempt was made to enable respondents to give their own responses without consulting their friends and reading materials.

Respondents of each college were composed of the regular and extension programs. However, there are conspicuous differences between them. While the “extension” respondents belong to the old curriculum (*majoring Geography*), “regular” students belonged to the new college curriculum (*majoring Social Studies*). While there are several major (core) courses in the old curriculum, there are very few major courses in the new system. Professional courses are the dominant part and major courses are a mixture of geography, history and civic subjects.

**Table 1.** Distribution of survey participants by gender and program (*% in parenthesis*)

	Variable	Overall (n=88)	SMC (n=44)	KTC (n=44)
Gender	Male	65 (74)	30 (68)	35 (79)
	Female	23 (26)	14 (32)	9 (20.4)
Program	Regular	36 (41)	7 (15.8)	29 (66)
	Extension	52 (59)	37 (84)	15 (34)

Correspondingly, five junior secondary schools were randomly selected from the Lideta sub-city of Addis Ababa (Table 2). In each school, both principals and head of geography department/environmental clubs were involved in unstructured interview on the environmental activities pertaining to their school.

**Table 2.** Summary of Junior Secondary Schools Involved in the Survey

Name	Ownership	Grades	No. of Students	No. of Teachers
Meskerem 1	Public	1-8	505	16
Tesfa Kokeb	Gov't	1-8	2,555	64
Hiwot Birhan	Public	1-7	316	12
Bekele Woya	Public	1-6	400	11
Balcha Aba Nefso	Gov't	1-8	5,000	130

Both qualitative and quantitative methods were employed in the data analysis: quantitative (for the questionnaire generated data) and qualitative (for data obtained from unstructured interview). The quantitative data was analyzed using statistical software called SPSS.

## **4. Results and Discussion**

### **4.1 Analysis of Knowledge and Attitude of College Students**



While 69% of respondents have lived in Addis Ababa for more than 5 years, only 45% were born in the city. However, since all respondents have lived in Addis Ababa at least during college years, all are “adequately” exposed and familiar to various aspects of environmental conditions in the city. In overall, respondents of the extension program have lived much longer years in Addis Ababa than regular students.

On the other hand, about 33% of respondents had the experience of membership in environmental clubs during high schools. This poor environmental experience demonstrates the common limitation of environmental extension in high schools. This might have posed stern limitation on the appreciation of immediate surrounding. This assertion is further exacerbated by the gruesome fact that only 7% of them have experienced an out-of-campus environmental visit during their pre College life.

#### **4.1.1 Assessment of Factual Knowledge**

Factual knowledge of environment emanates both from theoretical and practical aspects of geography. While environmental issue is very diverse and difficult to be covered under the Diploma curriculum alone, most of the issues raised in the interview are the widely circulating facts on different forms of media in the country. Therefore, excellent knowledge of environmental facts could strongly be linked to the students’ personal interest to observe, read and listen to environmental issues. Such qualities are the required assets in the mindset of potential teachers.

While the percent coverage of Ethiopian forest is widely mentioned in numerous media and forums, close to 30% of the respondents were unable to verify it correctly (Table 3). The knowledge itself significantly differs across gender and College types. In this respect, female respondents were more knowledgeable than male counterparts. Also, SMC respondents were found more exact than KCTE. On the other hand, only 57% of respondents were able to correctly respond the percentage solid wastes collected by the Addis Ababa Municipality. However, estimate of solid waste collection in Addis Ababa was not correlated with the program type.

**Table 3.** Selected questions of factual knowledge regarding local, national, and global environmental issue.

Question	SMC		KTC		College	Gender	Program
	Rg	Ex	Rg	Ex			
	%	%	%	%			
% of solid waste collected by AA City	61	58	63	46	*	*	NS
Awareness on Ethiopian Environmental Policy	55	51	43	44	NS	*	*
Is environment enshrined in Ethiopian Constitution?	22	36	31	38	NS	NS	*
Suitable seasons of malaria	61	76	70	78	NS	*	*
Percent coverage of forest in Ethiopia	68	80	62	76	*	NS	*
Know how of Agenda 21	15	10	21	26	NS	NS	*
Two sources of ozone depletion	23	18	11	14	NS	*	*
Two water borne diseases	58	71	51	59	NS	*	*
Two industries of AA known for air pollution	71	75	69	76	NS	*	NS
Two industries of AA known for water pollution	80	86	69	84	*	*	*

**Results of analysis: \* =  $p < 0.05$ ; NS = not significant, and Rg and Ex are regular and extension program respectively.**

While Agenda 21 was famous in the environmental arena, which was coined during the World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002, only 18% of total respondents knew about it. Again, there were no significant differences among colleges, gender and program types. With respect to ozone depletion, only 16.5% of respondents were not able to correctly mention at least two accountable sources. While there are no significant differences in college and gender, old curriculum respondents are significantly better clued-up than new curriculum respondents. However, compared to most questions of environmental facts, respondents are strong enough to respond about industries found in Addis Ababa which are blamed to pollute air and river waters.

Amazingly, awareness on the country’s policies pertaining to the environmental issue is very limited. More than half of the respondents do not know about the availability of any environmental policy in

Ethiopia. Even more respondents (about 69%) do not know that the Ethiopian constitution has enshrined an article on environmental issue.

#### 4.1.2 Attitudes towards Environment

In order to assess the relative importance of various issues compared to other societal problems, students were asked to choose the most important societal problems (unemployment, crime, democracy, chat addiction, health environment, drug addict, income disparity). SMC respondents ranked crime as the most serious problem, whereas KCTE respondents ranked it at fifth position (Figure 1). Problem of unemployment is cited as the most important issue by KCTE respondents. Income disparity is the least societal concern for both colleges. Environmental issue is the 6<sup>th</sup> important issue among the 8 alternative problems.

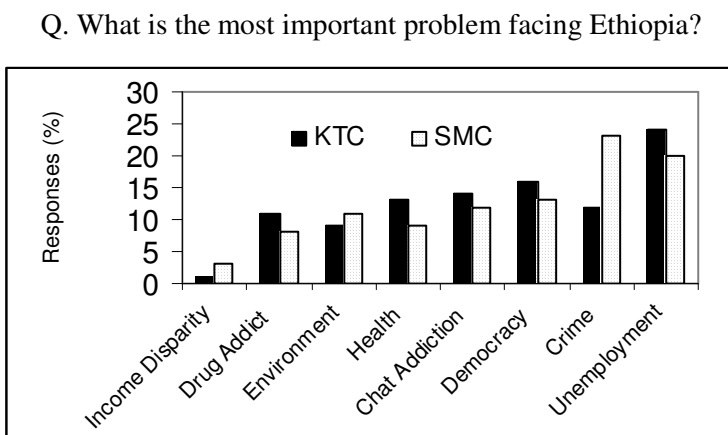
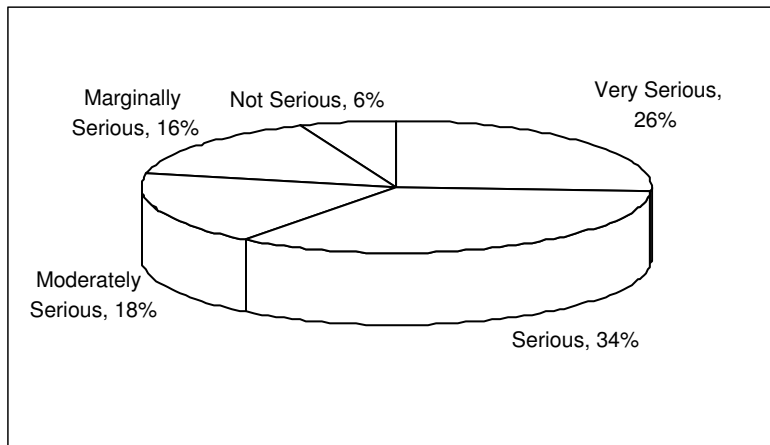


Figure 1. Percentage of respondents citing the most important problems

Surprisingly enough, when the state of Ethiopian environment is presented for rating, about 34% of respondents has labeled it “serious” and 26% of them as “very serious” levels. Nevertheless, only 6% of them have put it under “not serious”. Despite its “little significant” rating when compared to other societal problems, this result (Figure 2), however, shows the concerns of respondents towards environmental deterioration in the country, which can be an important factor for future action.

Q. How do you express the Ethiopian environmental problem?



**Figure 2.** Views of Respondents on the Seriousness of Environmental Problem in Ethiopia

The fact that 75% of the respondents somehow believed that “there is ample expandable agricultural lands” (Table 4) is a dangerous myth which is akin to the common opinion of most rural population. Such a notion is encouraging farmers to clear more lands for the food production, through extensification, than maximizing the productivity available cultivated lands, through intensification.

Of the total of respondents, 35% of them do not have the opinion that afforestation cannot replace the natural forest’s merit. Such believe again encourages people to cut more trees with a pretext of planting trees. However, planting trees is mostly conducted on campaigns, and in doing so, very little fraction of them do get the benefit of growing high. It is good to know that most respondents (about 76%) have realized the consequences of rapid population growth on the degradation of the environment. However, the remaining 25% of respondents are still substantial proportion in a condition where environment induced problems is dazzling in the country.

**Table 4:** Views about the Environment by Respondents

Statement Number	(I) SA	(II) MA	(III) DA	(IV) SDA	Total N= 87	I+II	III+IV
1	44	31	19	6	100	75	25
2	17	18	27	38	100	35	65
3	53	23	15	9	100	76	24

STATEMENT 1: “In Ethiopia there are ample expandable agricultural lands”.

STATEMENT 2: “Forest degradation problem could easily be solved through afforestation”.

STATEMENT 3: “Rapid population growth has strong impact on environmental degradation”

*Where, SA= Strongly Agree; MA = Moderately Agree; DA= Disagree; SDA = Strongly Disagree*

#### 4.1.3 Attitudes towards Teaching Environmental Education

The majority of responding students are quite aware of the suitable timing for undertaking field based teaching of afforestation and water-induced soil erosion in Addis Ababa (Table 4). However, there are significant differences between program types on the attitude of suitable months to teach afforestation and water-induced soil erosion, where old curriculum students have shown better response.

**Table 5.** Percent responses to selected questions assessing attitudes towards teaching environmental issues in junior secondary schools.

Question	SMC		KTC		College	Gender	Program
	Rg	Ex	Rg	Ex			
	%	%	%	%			
Suitable months to teach afforestation in field	87	93	90	91	NS	NS	*
Suitable months to teach water induced soil erosion	78	94	93	89	NS	*	*

**Results of analysis: \* =  $p < 0.05$ ; NS = not significant and “Rg” and “Ex” are regular and extension programs of each College respectively.**

**Table 6:** Views on the possibility of the AA environ to teach some components of environment on field:

	Yes	No	Not sure	Total N= 87
Rocks	34	42	24	100
Soils	39	31	30	100
Water pollution	28	43	29	100
Waste management	61	27	12	100

*All figures are in percentage*

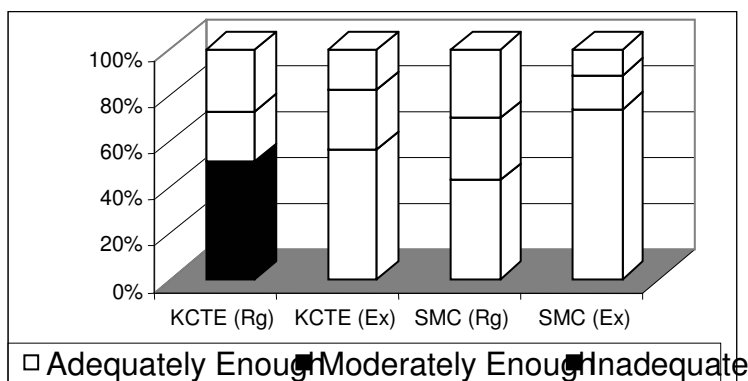
About 42% of the respondents disagree to the view that teachers could teach about rocks outside of school environment, while a quarter of them are not sure of its practicality (Table 6). Only 34% of the respondents have agreed with the suitability of the Addis Ababa environ for conducting in site observation of rocks. With respect to soil, only 39% view that it could be taught on its natural setting, while 61% of respondents are either disagreeing or not sure of it. The worst possibility is given to the practical orientation of water pollution, where only 28% of the respondents are optimistic about it. The higher chance is attached to water pollution where about 61% of the respondents are sure of harnessing the potential of waste management.

Table 6 generally witnesses that the suitability of the Addis Ababa environment as being overlooked by the substantial proportion of respondents. However, in the city there are many areas where rocks and soil are ubiquitous and widely exposed in the city. With respect to the possibility of teaching about rocks in the field condition, there are significant variations in College type, gender and program types. While SMC respondents are significantly optimistic than those of KCTE, extension students are significantly more optimistic than regular program respondents. There are no significant differences among gender class, though.

With respect to soils, there are significant variations in College type, gender and program types. While KCTE respondents are significantly optimistic than SMC; females are more significantly optimistic than male counterparts. With respect to program types, extension students are significantly more optimistic than the regular ones.

Students were requested to comment on the adequacy of environmental education they learned in college for teaching assignment in grades 5-8 after graduation (Figure 3). Except the regular students of SMC, the rest categories have a < 50% of respondents have labeled their environmental knowledge obtained from College curriculum is adequate enough to comfortably teach after their graduation. Such discomfort undoubtedly results in poor undertaking of environmental education in the post graduation period.

Based on the prior exposure of respondents to junior secondary schools through teaching practice, they were requested to assess the compatibility of the school time table to discharge environmental education (Figure 4). However, only less than 50% of the respondents have considered it as compatible enough. The rest have either labeled it as “inadequate” or “moderately enough”.



**Figure 3** Views of Respondents on the Adequacy of College Curriculum to Teach Environmental Education in Grades 5-8.

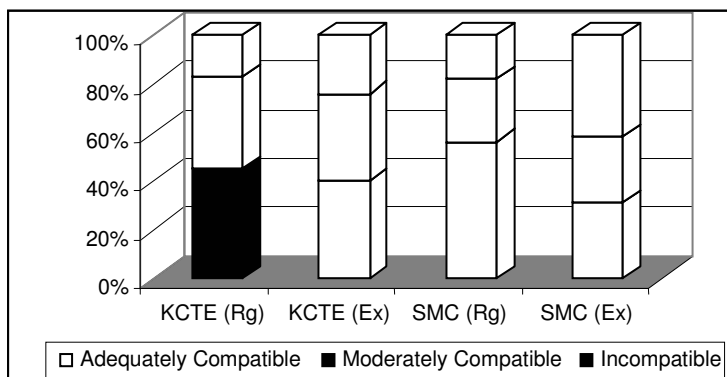


Figure 4. Views of Respondents on the Compatibility of Schools’ Timetable for Practical Environmental Teaching

## 4.2 Assessment of Curriculum

### 4.2.1 College Curriculum

One of the unique aspects of joining Geography Department is to have more awareness in environmental issue through practical observation in the field situation. However, there are marked differences not only between old and new curriculum batches, but also among the two Colleges. In general, the old curriculum has embodied several field oriented major courses like Resource Analysis, Land Form, Climate, etc. In the new curriculum, major transformation has been made not only on the elimination of major courses (Table 7), but also narrowed the possibility of undertaking fieldwork.

**Table 7.** Patterns of Major Courses in Diploma Programs of Teachers Colleges

Before 1998	1998-2003	After 2003 <sup>3</sup>
Geography of Ethiopia	Geography of Ethiopia	Social Studies I
Int. Econ Geography	Int. Econ Geography	Social Studies II
Landform Geography	Landform Geog	Social Studies III
Int. Climate	Int. Climate	Social Studies IV
Resource Analysis	Resource Analysis	
Geog of Population	Geog of Population	
Geography of Africa	Geography of Africa	
Map Reading	Map Reading	
Biogeography	Survey of World Geog	
Econ. Geog of Ethiopia		
Geography of Transport		

The current declining importance of field practicality could be attributed to the focus shift from “major-dominance” of the old curriculum to the “professional-dominance” in the new curriculum (Figure 5). This shift has induced a change of practicality concept. Formerly, practicality has implied both for environmental and teaching practices. The newly introduced system has implied solely on the concept of teaching practicum. While the new system allows candidates to be more exposed to

<sup>3</sup> This is a 10+3 Social Science Stream Program



school teaching learning process, they have lacked the most vital asset of Geography, which is the practical exposure to the biophysical and socioeconomic environment.

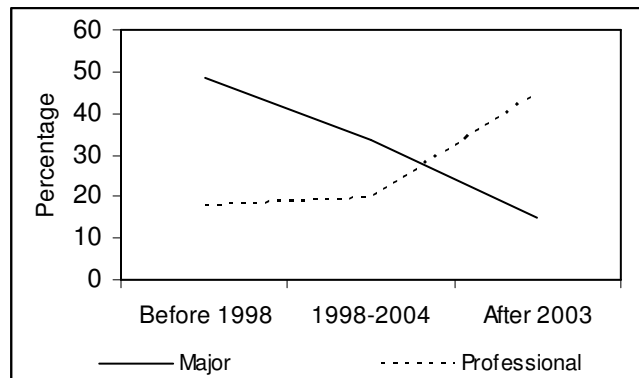


Figure 5. Major – professional proportion of courses across different periods in the Teachers’ Colleges, Diploma Program

The two colleges have been compared based on responding students’ information and the interview with respective to college representatives. While the course types and credit hours are uniform, there are minor and major differences in the implementation of environmental practice in the old and new curriculum, respectively. In the old curriculum, the colleges had the experience to frequently take students out to target areas for a day or two long specified for different courses. Such approach is efficient to link theoretical knowledge with field practical experience through the tutorship of instructors. Besides, such approaches were efficient to enforce students to seriously do field exercise as it contributed to the grading in each course.

However, all the good aspects of field experience have withered and are at the verge of disappearance in both colleges but at different magnitude. This is due to the declining space for major course and the greater commitment of students in the practicum affecting the time available for planning and implementing field practical. While SMC has still little field attachment in the new curriculum, KCTE has totally abandoned the out-of-campus environmental exposure. Of course, this difference could be attributed either to the commitment of respective instructors to plan and undertake environmental trips in SMC or the impact of rising number of candidates in KCTE which discourages the manageability of field trip.

## **4.2.2 School Environment**

The five selected schools chosen for the case study are totally found in Lideta Sub City. They are situated in the middle of Addis Ababa, where all forms of environmental problems prevails. There are two streams: Little Akaki and Lideta River. While Little Akaki is mainly polluted by discharges from factories, Lideta River is the most polluted river of Addis Ababa due to huge dumping from Mercato area. These two rivers are found within 2 km radius from those schools. There are factories, which are believed to pollute the environment from their discharges in the school vicinity. Examples of such factories include Awash Winery, Addis Beverage, St George Brewery, and the like. Moreover, there are hospitals in close proximity to those schools, viz., Dj. Balcha and Police Hospitals are partly responsible for the pollution in those areas.

Apart from point sources of pollutants, the locality is extensively littered with rotten vegetables, corpses of dogs and cats, dry waste dumping, freely flowing liquid disposals, etc. even at the doorsteps of those schools. This garbage of environmental wastes coexist with small hotels, open vegetable and cooked food markets, and residential units. In short, schools and their environ are surrounded by oceans of environmental problems.

Potentially, each school can undertake practice-oriented environmental education in either or all of the following ways, where each approach could have its own merit and demerit for different aspects of environmental education:

1. By bringing environment related samples or pictures to the school. This could be made possible either by putting those materials in the pedagogical center of schools, so that students can go there and have a look at it or by bringing these materials to each classroom by the course instructors.
2. Taking out students from classrooms, and teach them within the school compound. Such method allows teaching about various environmental issues like cloud, soil, rock, vegetations, micro organisms, etc.
3. Making students go to an out-of-campus environment to give first hand information on rivers, waste disposals areas, pollution areas, rock s, soils, etc.

However, the above potentials which are also common in Addis Ababa at large are not harnessed by most of the studied schools. Responsible factors for such failure are outlined below:

1. The declining curriculum space to geographical topics, which are the core component of environmental education, from school text books and syllabus. In the new educational system, attention is given to budding subjects like civics, and bolstering of other subjects like Science, Mathematics and English languages. For instance, the former General Science has further specialized to Physics, Chemistry and Biology, which shows the tremendous focus given by the government. Regrettably, it has been done at the expense of Geography.
2. The declining of school space to undertake out-of-class room environmental teaching. This is mainly due to the physical expansion of schools which take every available space for the construction of new buildings. Such activity has not only consumed the future expandable areas, but also demolished prevailing environmental activities (*seedlings, forest, vegetable gardening, etc*). In most of the surveyed schools, there are no available spaces for any environmental activity.
3. Lack of teachers' ability and interest to conduct practical environmental education. Primarily, it could be the inadequate environmental knowledge they gained during college life, or, it could be the misconception of most teachers where practical environmental education could only be made at far away locations, which require huge financial supply, great coordination, and long duration. They often overlook the enormous environmental resource quite in the door steps of schools which do not require extended periods, transportation vehicles, and much coordination.
4. Lack of awareness from school officials towards practical orientation of environmental education. This is true where such practice undeniably induce stress on the school management as there are instances of going out from schools, communication with different factories, hospitals, etc. the weak awareness is evidenced by the little attention given to environmental clubs, vis-à-vis Anti-HIV, Female, Civic and other clubs.
5. Lack of financial resources to assist the practical oriented environmental education in schools is also the other constraining factor.

## **5. Conclusion and Recommendations**

Environmental degradation is threatening not only the natural resource but also the nation's economy. Such degradation is partly caused by lack of awareness. Colleges and schools are the ideal place to instill and trickle down environmental literacy across different cross-sections of the society. As the old American adage goes, "it is better to plant a \$ 25.00 tree in a \$ 50.00 hole, than a \$ 50.00 tree in a \$ 25.00 hole".

The study has confirmed that the overall factual knowledge of local, regional, and global environmental issues in the surveyed Colleges has been found inadequate. This shows the superficial understanding of environmental problems, which is partly induced from inadequate environmental knowledge delivery system. This low level of factual knowledge in environment is a source of worry, considering that respondents were senior College students. Even from those who think they are concerned of the environment, they have overlooked the richness of the local environmental resource. Rather, they have imagined fancy fieldtrips which trespass wide geographical coverage and famous tour sites, which is unmanageable and unaffordable by Ethiopian Colleges. Paradoxically, most of the local resources are not harnessed both by Colleges and schools. For instance, in none of the surveyed schools there is practice-oriented geography teaching even within the school campus or in neighboring environmental spots.

With respect to the existing policy environment, it is frustrating to observe that the space for environmental education is rapidly shrinking not only in physical spaces to undertake it in school compounds but also in the curriculum space where its importance is waning at the expense of other 'prioritized' subjects.

In conjunction with the above stated challenges and weaknesses, there are ample windows of opportunities to harmonize environmental issue to the teaching learning process both at the teachers Colleges and schools. While the rapid alternative suggestion is to change or modify the school and College curriculum so as beef up the environment at breadth and depth, the execution of such endeavor stipulates series of debates and forethought. However, the rapidly degrading environment in

the country does not afford such a long delay. In this regard, there are two realistic strategies for Colleges: either to reduce the professional courses or to cancel the minor course specialization.

At last, the following immediate measures are recommended as a realistic and affordable scheme to easily be undertaken by Colleges and schools:

- To corroborate every theoretical environmental topics with practical aspects from immediate environmental resource;
- Strengthen and support environmental clubs to accommodate substantial members of the school and College community. Such endeavor transcends the departmental boundaries and informally instill environmental literacy;
- Promote environmental debate among students and set up environmental awards to outstanding and exemplary students and instructors;
- Conduct regular training programs to College and school teachers with a prime intent of raising environmental awareness and accommodate environmental issue in any available opportunity, and
- Increase the participation of schools and Colleges in local environmental campaigns and actions.

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