BACKGROUND
The importance of adequate water, sanitation, and hygiene (WASH) in the prevention of morbidity and mortality from infection diseases caused by water-borne parasites, bacteria, viruses and protozoa is widely acknowledged. Unsafe water, inadequate sanitation, and insufficient hygiene are responsible for 80% of diarrhoea worldwide (Pruss-Ustun et al., 2008). Despite recent efforts by the government and local and international organizations, access to improved sanitation across diverse geographical and ethnic areas remains a significant problem in Ethiopia. Schools present a desirable space for WASH interventions that have the potential to impact health, and subsequently attendance and overall performance in education. The Community School Partnership Program (CSPP), an initiative of the Children US funded by the United States Agency for International Development, aims to promote educational and health outcomes for primary school children in Ethiopia. One of the objectives is for all schools to have a potable water source, hand-washing facilities, and segregated latrines. Such interventions face many challenges, particularly with regards to sustainability. This study focuses on investigating barriers to sustainability of use and maintenance of water and sanitation facilities and identifying best practices.

STUDY AREA
Ethiopia, with a population of more than 90 million, is the second most populous African nation and has some of the poorest water and sanitation coverage in the world. Only 42% of the population had sustainable access to improved drinking water sources as of 2006, and a mere 13% had access to improved sanitation (WHO, 2008). Part of the challenge of delivering large scale interventions is the sheer variety of cultures, landscapes, climates, and institutional capacities. Woreda water officers are responsible for monitoring and technical assistance, but are often limited in resources and capacity to do so in practice. An effort visit schools in as many regions as possible was made in order to try to capture such variety and obstacles schools in different settings may face with regards to development, use, and maintenance of water and sanitation in schools. Data was collected in Amhara, Gambella, Oromiya, Somali, Tigray, and Southern Nations, Nationalities, and Peoples Region.

METHODOLOGY
Sample Selection
Criteria for school selection included designation as a CSPP target school, presence of a water point and/or latrines, and willingness of local staff to accompany the researcher to the site. Schools were not notified prior to visit. Due to the considerable distances between schools, particularly in rural areas, a purposive sampling technique was used, taking into account climatic and geographic variability.

Key Research Questions with Objectives
1. What is the existing infrastructure for drinking water, hand-washing and sanitation in CSPP schools in Ethiopia?
   - Investigate coverage of drinking water, hand-washing, and segregated latrines among CSPP schools in order to determine where gaps remain.
   - Inspect the type and condition of WASH hardware and software to gain insight into what works and what common challenges exist.
2. What are the prevailing systems for management, maintenance, and repair of drinking water, hand-washing, and sanitation facilities?
   - Determine who is responsible for different aspects of water and sanitation at the school level.
   - Investigate how both the school and larger communities contribute to water, sanitation, and hygiene at the school-level.
   - Document lessons learned about school-level successes and failures.
3. What are the barriers to sustainable use of the school WASH facilities?
   - Explore student beliefs and practices regarding hygiene and sanitation to find opportunities for improvement in knowledge and lessons on how to make facilities more child-friendly.

In-depth questionnaires and structured observations were conducted at 46 CSPP target schools in order to explore these questions. Qualitative analysis was based on structured and semi-structured interviews, focus group discussions (FGDs), and extensive observations. Relevant CSPP staff, School Directors, parent-teacher association members, teachers, students and Woreda officials were interviewed.

Conceptualizing Sustainability
Sustainability has several dimensions, including economic, social, technical, environmental, institutional and functional. In the context of delivery of water and sanitation services, however, it is useful to narrow the definition of sustainability to one that embraces community participation and control. There are many approaches to sustainability, but the core of the concept is that development programs become self-sustaining in the long run and can continue to function after the withdrawal of external support. In-depth studies to explore the disconnect between knowledge and practice should be carried out.

Essential and interlinked aspects of a sustainable WASH project

In-depth studies to explore the disconnect between knowledge and practice should be carried out.

CONCLUSIONS & RECOMMENDATIONS
Overall, the use of latrines and hand-washing by students is reported to be steadily improving. FGDs with children indicated that awareness of the importance of water and sanitation is not lacking. Behavior change takes time, so it is vital to continue promotion of hygiene until a critical mass is reached.

Opportunities for improvement of existing strategies:
- Records of school activities should be expanded to include WASH, to encourage accountability.
- Income-generation at the school-level should be encouraged to contribute towards WASH.
- The full potential of all school staff, including guards, should be utilized to improve supervision.
- Promotion of WASH in school and the community should continue.
- In-depth studies to explore the disconnect between knowledge and practice should be carried out.

Best practices for sustainability of WASH facilities:
- Water source development should occur under the guidance of a qualified professional.
- Seasonal timing of construction development should be taken into consideration.
- Access to taps should be limited to staff or designated club leaders who facilitate drinking.
- Containers for daily storage of safe drinking water should be used if possible to minimize waste.
- Measures to protect facilities from theft and damage should be taken.
- Contributions from community and parents may be leveraged to provide soap for hand-washing.
- If latrines lack doors, temporary solutions to provide more privacy should be encouraged.

ACKNOWLEDGMENTS & REFERENCES
I would like to thank WSSS, Tufts Institute for the Environment, and Feinstein International Center for financial support of this research. Thank you also to Save the Children US for in-country logistical support, to my advisors Dr. Peter Walker and Dr. David Gates, and all study participants.