Texas Water Resource Institute Mills Scholarship Program (2009-2010)

Student Name	**:**	CHANDANA DAMODARAM
Address	**:**	
E-Mail	**:**	
Phone Number	:	

Faculty Advisor	**:**	Dr. Emily M Zechman
Address	**:**	Assistant Professor Zachry Department of Civil Engineering Texas A&M University College Station – 77843, Texas
Email	**:**	ezechman@civil.tamu.edu
Phone Number	**:**	979-845-2875

Description:

Watershed urbanization increases the peak flows and volume of storm runoff, which eventually alters the natural flow regime of the stream and affects the in-stream ecosystem. To mitigate these impacts there is a range of various technologies, including Best Management Practices (BMP) and Low Impact Development (LID). BMPs typically provide centralized control of storm water to reduce the peak flow and the total runoff volume that is discharged to a receiving body of water. For example, detention and retention ponds control all runoff from a watershed at the watershed outlet. Alternatively, LID practices typically control generated runoff at the source, such as roof tops and parking lots, through the use infiltration media or retention areas. Through a more decentralized control of stormwater, the complete pre-development flow regime may be replicated; BMPs typically control only the peak flow. LID strategies include permeable pavements, rainwater harvesting systems, green roofs, and vegetated swales. Urban planners and land developers may still be hesitant to implement LID, as current literature does not quantify the extent to which LID will improve the adverse impacts of urbanization on storm water. My research focuses on modeling LID within a hydrologic model to evaluate development plans and estimated the hydrologic sustainability of LID based on peak flow reductions.

This research will consider a case study to demonstrate the stormwater mitigation that could be achieved by using LID. Development on Texas A&M University's west campus has greatly increased over the past few years through the construction of buildings, roadways, and parking lots. Campus development has degraded the hydrologic conditions of a tributary that cuts through west campus, resulting in erosion problems. In my preliminary research, I developed a simulation model which replicates pre-development conditions based on an aerial map of the campus in 1940. I compare the flow conditions of the 1940 land use patterns to current land use patterns.

My proposed research will focus on building a simulation model and modeling approach to study the hydrologic performance of LID, including rainwater harvesting and permeable pavements. The flow regime for the present conditions, pre-development conditions, and different LID strategies will be compared to evaluate the hydrologic sustainability. This would enable to quantify the stormwater that is properly managed using these mitigating strategies. Given budget constraints, the placement of LID techniques are limited and the permeable pavement or rainwater harvesting that could be implemented should be placed to have the largest impact on stormwater management. I plan to integrate the

hydrologic simulation model with optimization methods to identify the locations of these LID strategies in the Texas A&M West Campus that would maximize stormwater savings while meeting budget restrictions.

Reference: P3 Report on Improving the Hydrologic Sustainability of Texas A&M University Campus, April 2008.

Academic Qualification

Aug 2008 – Present	Texas A&M University College Station, Texas MS in Water Resource Engineering	Expected graduation May 2010 GPR :
Aug 2001 - May 2005	Birla Institute of Technology & Science Pilani, India B.E (Hons) Civil Engineering	GPR :

Work Experience

July 2005 – July 2008	TCE Consulting Engineers Limited Mumbai, India	Position: Civil Engineer – Infrastructure Unit

Scores

GRE:
English Language Proficiency Exam:

Courses

Water Resource Systems Analysis
Geomatics
Water Resource Planning and Management
Advanced hydraulics

Proposed usage of funds:

With the resulting funds I would like pay my tuition fees, and university fees. Further these funds would help me fund my travel expenses for academic conferences.

Intended career path:

After finishing my Masters degree in Water Resource Engineering I intend to pursue my career in a water resource consulting firm. With my research finding and my knowledge I would like to contribute in planning and designing sustainable systems which benefit towards water conservation.