The Use of Wood in Set Construction for Theatrical Performances
ENVS 6179: Climate Change
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Background

Originally, the purpose of this project was to develop a methodology to establish baseline metrics for assessing the environmental impacts of theatrical production. However, after further consultation with McKernan, it was decided that the process of calculating baseline metrics should begin at the outset of the pre-performance stage so that an accurate assessment could be reached. By the time I had begun this project, that stage had long passed so calculating baseline metrics would not be useful to the Department. The scope of the project then turned to costume design in a York theatrical performance and with input from McKernan, it was decided that I would conduct an environmental audit of the costume wardrobe.

After an interview with Doris Haidner-Seif, Wardrobe Assistant for the Department of Theatre, it was found that the Department's purchasing, sourcing, manufacture and disposal procedures for costumes are as environmentally responsible as they can be given budget constraints. Recommendations to improve environmental performance are not financially viable. For example, the laundering of costumes is done using a top loading washing machine whereas a front loading Energy Star appliance would use less water and energy. To replace these machines before the end of their useful life with more efficient appliances is too expensive.

Another opportunity for energy savings is the students' workspace in the Wardrobe. The workspaces are lit with incandescent bulbs. Upgrading the bulbs to compact fluorescent bulbs was discussed but I was informed by both Ms. Haidner-Seif and Professor McKernan that the York Facilities Department is responsible for the replacement of lighting and would be reluctant to replace working bulbs. More importantly, such a project would be low on their list of priorities which could drag out the project far beyond the end of this course. Another issue was that upgrading bulbs in the Wardrobe to CFLs is not in the Theatre Department's budget and so funding is needed. I was informed that procurement policies at York University are laden with bureaucratic red tape so that any attempt to apply for funding would be a laborious endeavour which would also extend the timeline of this project beyond the end of the Winter semester.

As a result, the purpose and scope of the project was revised in consultation with Professor McKernan. McKernan supervises the construction of sets for theatrical performances at York. The most commonly used building material is wood and the Department has yet to implement a sustainable wood sourcing policy. The purpose of this project is to research the environmental impacts of the types of lumber most commonly used in constructing sets for theatrical performances at York, explore various wood certification schemes, and identify suppliers within the region that supply certified lumber products appropriate for the Department's construction needs.

The goal of this project is to provide the Department with a useful resource guide that contains all the information the Department will need to move away from environmentally harmful wood purchases. Given that the Department purchases an estimated $10,000 per year on lumber, there is ample opportunity to improve the environmental performance of theatrical performances through the use of a sustainable wood procurement policy.

Introduction

There is a movement emerging in the theatre community to reduce the negative impact of theatrical performances on the environment. In London UK, and on Broadway in New York, theatre is moving in a more sustainable direction with the launch of industry-wide initiatives to reduce the theatre sector's eco-footprint (Shevitz, 2008; Greater London Authority, 2008). The Department of Theatre at York University is also beginning to think critically about the environmental impact of its performances and is currently working on initiatives to green its practices and reduce its eco-footprint.

Those promoting the eco-theatre movement cite the rapid process of creation and subsequent destruction that characterizes theatrical production (Lawler, 2008). Theatrical productions are elaborate undertakings and each stage of the production process involves its own set of energy and material requirements and associated environmental impacts. This project will focus specifically on the environmental impacts of lumber used in set construction.

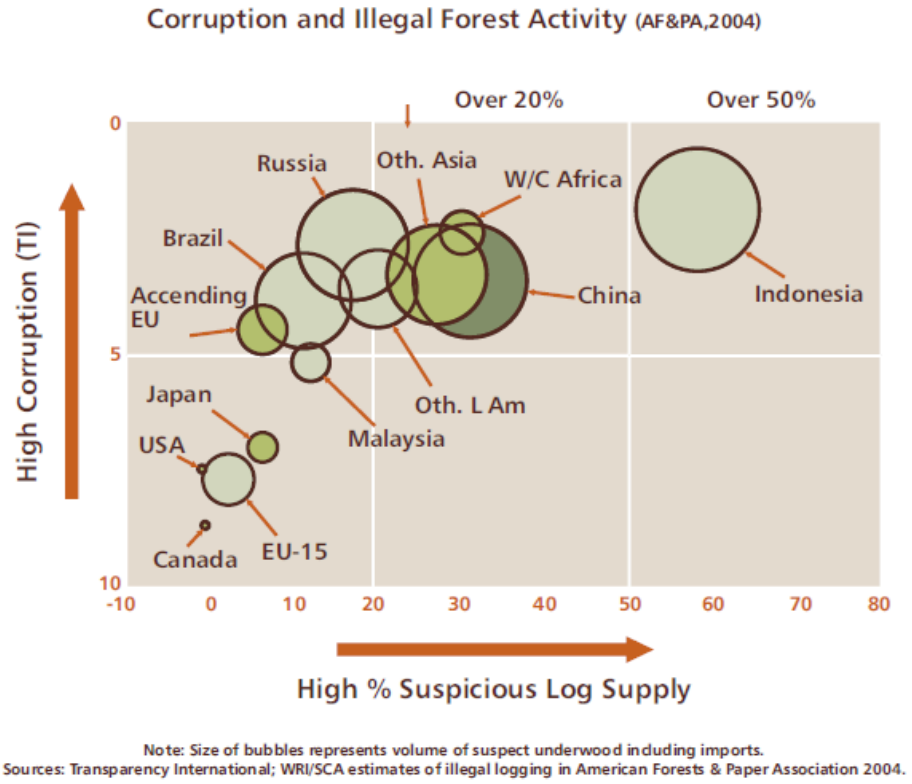
Sustainable forest management practices play an important role in addressing climate change. Forest certification schemes that verify and ensure the sustainable management of forests and offer a labelling program to direct consumers to their products provide a practical and effective way for the Department of Theatre to use their purchasing power to effect change (Hansen et al., 2006). However, a proliferation of certification schemes with varying standards exist on the market today confusing consumers as to which certified lumber they should purchase (Ibid). To facilitate prudent purchasing decisions, consumers need to be informed on which scheme applies the most rigorous and comprehensive standards for certification. The species of wood and the region from which it is harvested can also contribute to harmful environmental outcomes and should be considered (Ibid). Alternatives to purchasing raw lumber and minimizing waste during the construction stage may also be viable options in reducing the environmental impact of theatrical performances.

Forest Management & Climate Change

Forests play an important role in the mitigation of climate change by acting as carbon stores and sinks. According to the United Nations Food and Agriculture Organization, the total carbon content of forest ecosystems in 2005 was more than the amount of carbon in the entire atmosphere (UNFAO, 2005). Through photosynthesis, trees and soil absorb and store carbon dioxide. As trees mature and stop growing, their capacity to absorb carbon dioxide decreases. Much of the stored carbon dioxide is released back into the atmosphere when trees die and decay (or burn) (BC Forestry Climate Change Working Group, 2008). The remaining carbon is stored in forest debris and soil. Reforestation combined with the manufacturing of trees into building products maintains the carbon reservoir by allowing the forest to regenerate with young trees while carbon dioxide remains stored in products (Ibid). This contributes to the mitigation of climate change by producing a net reduction in carbon dioxide emissions.

According to Baumert et al. (2005), approximately 18 percent of global greenhouse gas emissions are attributable to land use change and forestry with deforestation in developing countries acting as the main source. Illegal logging in the tropics is a prime source of deforestation and habitat destruction that undermines the sustainability of forest ecosystems and jeopardizes the viability of legal harvesting and trading practices (BC Forestry Climate Change Working Group, 2008). Poverty, weak governance and

corruption are at the root of illegal logging (Ibid). This is rarely an issue in Canada because an effective governance structure is in place that promotes and enforces sustainable forest management (Ibid).



Source: BC Forestry Climate Change Working Group, 2008

Because deforestation, degradation and poor forest management reduce carbon storage in forests and increase greenhouse gas emissions, it is crucial to source lumber from certified sources that guarantee sustainable forest management (UNFAO, 2005). In addition, scientific studies have shown that climate change will impact the world's forests by increasing the vulnerability of forests to the risks posed by invasive species and natural disturbances such as disease, fire and insect infestations (IPCC, 2007). To minimize these impacts, sustainable forest management plays an important role once again. Sustainable forest management refers to "management that maintains and enhances the long-term health of forest ecosystems for the benefit of all living things while providing environmental, economic, social and cultural opportunities for present and future generations" (BC Forestry Climate Change Working Group, 2008). It includes managing forests in a manner that enhances their capacity to absorb and store carbon.

The Department of Theatre at York: Most Commonly Used Lumber in Set Construction

	Species	Dimension
Solid	Pine	1x3
	Spruce	2x4
	Spruce	2x6
	Spruce	2x8
Sheet	Lauan Skin Plywood	1/8"
	Lauan Skin Plywood	1/4"
	Poplar Plywood	1/4", 1/2", 3/4"
	Fir Sanded	1/4", 1/2", 3/4"
	Spruce	1/4", 1/2", 3/4"
	Birch	5'x5', 4'x8'

Source: James McKernan, Assistant Professor, Department of Theatre, York University

Lauan: Environmental & Social Considerations

Lauan, also known as Philippine mahogany or merenti, is the general name given to a group of related woods imported from the Philippine Islands, Malaysia and Indonesia (Kaiser, 1994). Lauan is a generic term used for tropical plywood sold in North America (Rainforest Relief, 2006) which may be composed of "any one or more of hundreds of different species, all lumped into the same product" (Keating & Mizrahi, 1997). It is sold at artificially low prices which makes it an attractive import (Keating & Mizrahi, 1997). Philippine lauan was once the most exported wood from the Philippines but has virtually disappeared from the market due to clearcutting in the absence of conservation and sustainable forestry management practices (Kaiser, 1994). To satisfy demand for plywood exports abroad, massive logging has resulted in the destruction of most of the Philippines original forests (Rainforest Relief, 2006). Illegal logging of the remaining forest persists fuelling ongoing conflict between loggers, and landowners and indigenous people(Rainforest Relief, 2006). Substitutes now come from Thailand, Malaysia, Indonesia, Brazil and Africa (Kaiser, 1994; Ayscough, 2008b). Indonesia is facing the same fate as the Philippines as its primary tropical forests are dramatically diminished due to short-sighted, unsustainable harvesting practices. Overlogging causing deforestation is commonplace in Thailand, Malaysia and Indonesia, as is illegal logging in Indonesia and Brazil (Keating & Mizrahi, 1997). The result of such practices includes the destruction of native culture and prime habitat for endangered species, species endangerment and extinction, and leads to a loss of biodiversity and ecosystem services (Rainforest Relief, 2006). In addition, rainforest destruction is a serious contributor to climate change through the release of substantial amounts of greenhouse gases (Keating & Mizrahi, 1997).

Lauan plywood is commonly used in set construction in the theatre, TV and film industries because it is easy to work with using both hand and machine tools, and is easily painted (Kaiser, 1994). However, there has been a move away from the use of lauan in set construction stemming from the environmental and social concerns listed above.

Phasing out the Use of Lauan in Set Construction

NGOs takes on Hollywood

The Rainforest Action Network, Greenpeace and Earth First initiated a campaign in 1994 asking Hollywood's major studios to adopt a written policy which would phase out the use of lauan plywood in set construction and use alternative wood products instead (Rainforest Action Network, 2008). The major studios agreed to the phase-out, and since then have been actively pursuing sustainable alternatives. And although lauan's versatility and low cost has made the transition to alternatives difficult, the amount of lauan has been reduced (Rivard, 1996; Ayscough, 2008a). Film producer Gale Anne Hurd, used a green checklist during the shooting of The Incredible Hulk, which included using sustainable forest yellow pine wood instead of rainforest lauan (Ayscough, 2008a). She did concede that using the substitute was more expensive but only marginally so (Ayscough, 2008a).

The Greening of Toronto's Film Production Industry

Green Screen Toronto, a coalition of Toronto-based film industry associations and service providers, have initiated a program that endorses environmentally sustainable standards and makes recommendations for all productions shooting in Toronto (Green Screen Toronto, 2007). The coalition has released a practical guide to help film producers reduce the carbon footprint of productions and a resource guide to help them find green services and products in the Toronto region (Ibid). Toronto's Green-Screen Initiative is also working to develop a green film certification system for productions (Ibid). The coalition's main recommendations in regards to set construction are to reduce the use of the tropical hardwood lauan, and divert set-building materials from landfill through reuse, recycling or donation (Ibid).