

Environmental Problems: A Case Study of Amarapura Loom Weaving Area **Nyun Linn Tun¹ and Environmental Studies Students and Tin Moe Lwin²**

Abstract

The loom weaving industry in Amarapura has been popular from the Konbaung dynasty to the present. Nowadays, although the advantages from the rapid growth of textile sector, consequently environmental problems concerning discharges of wastewater, emission air, noise and waste solid are actually problems to be solved for the industry. End-of-pipe technology has used as tools for sustainable development of industry activities during the past years. Here, the paper is presented the status, environmental problems of textile industry and environmental protect solutions have been carried out for textile industry in Amarapura. How to build a model of integrated approach combining both cleaner production and end-of-pipe treatment for pollution prevention in the textile industry in Amarapura is still a question. To be a sustainable development for the loom weaving industry, it is required to organize a strong organization for controlling intellectual property right and to follow the instructions of waste management by the city development committee, dye limitations and also fair payment of labour.

Key words: loom weaving industry, environmental problems, end-of-pipe technology

Introduction

Textile industry has attained great successes in recent years. It has some advantages and disadvantages. The advantages are increased production processes, products, and employment through expansion industry sectors as well as step by step to improve life condition of inhabitant. The disadvantages are serious environmental pollution and scarce resource causing turbulent development of the industry. The textile industry releases highly polluted and very alkali or acidity wastewater and the dyes often contain toxic substances such as chlorine, chromium, alkaline compounds, zinc and copper. The accumulated several dyes and some of aromatic biotransformation products to surface, stream and underground lead to harmful effects on human health. The compliance with environmental regulations of textile factories is often targeted to avoid environmental problems. In order to economic development, pollution problems are contradictory concepts. The survey status of textile industry is carried out to study the measure of combination of both cleaner production approach and end-of-pipe technology to achieve sustainable development in the coming years.

The study Area

Amarapura is located in the central zone of Myanmar. It lies between latitude 21° 1" and 22° 0.5" North and longitude 96° 0" and 96° 07" East. It was a former capital of Myanmar during Konbaung Dynasty (1783–1821 and 1842–1859). Now it is a township of Mandalay City. Amarapura is bounded by the Ayeyarwady River in the west, Chanmyathazi Township in the north, and the ancient capital site of Ava (Inwa) in the south (Map1.1). It is historically referred to as Taungmyo (Southern City) in relation to Mandalay. Amarapura today is part of Mandalay, as a result of urban sprawl. It has an area of 205 square km. The township is famous today for its traditional silk and cotton weaving, and bronze casting. The indigenous Myanmar tradition of Acheik textile weaving originates in Amarapura, and became popular from the Konbaung dynasty to the present. The population of Amarapura township is 237,618 including 114,481

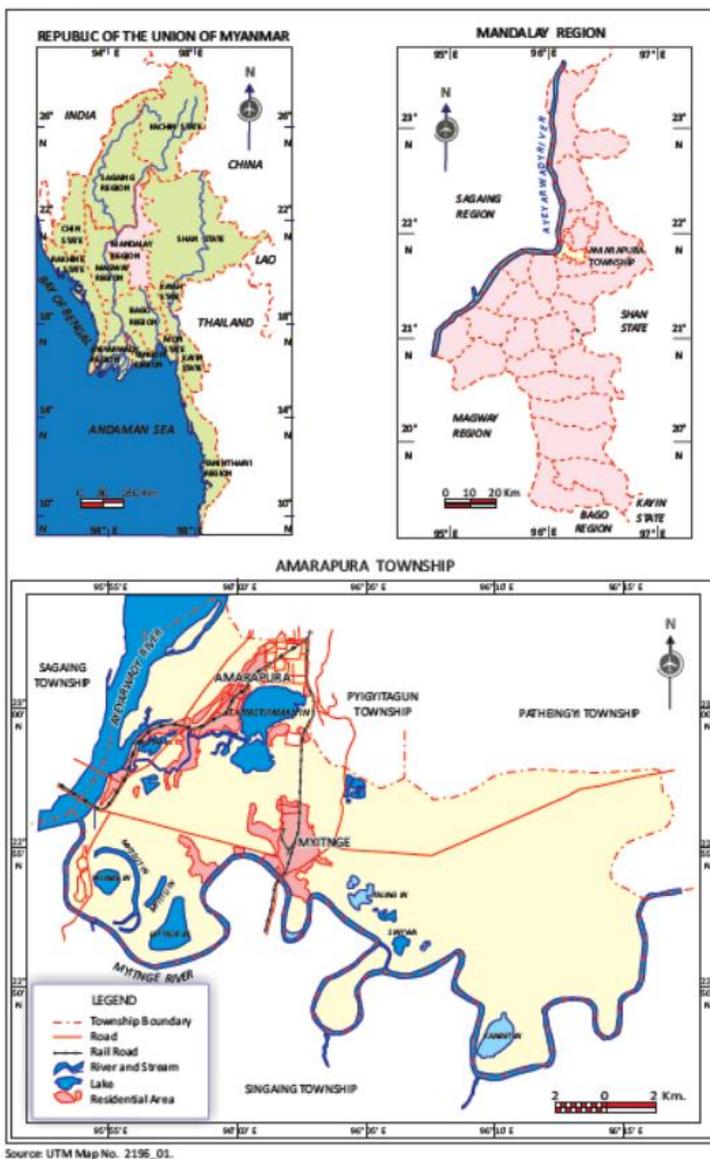
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males and 123,137 females. In Myanmar, 55% of textile industry is in Amarapura township. The textile industry in study area is the hub to distribute in upper and some neighboring townships.

MAP 1.1 LOCATION OF AMARAPURA TOWNSHIP



Aim and Objective

The aim of this paper is to examine the impact of environmental economic problems because of the textile industry. The objectives are to know the problems of loom weaving factory and environmental impacts because of loom weaving process

Data Source and Method

The study was conducted to field survey in loom waving industries in Amarapura Township, in November, 2020. It is an attempt to find out the impact of environmental economic problems regarding with the textile industry. Secondary data such as population, households, and houses are received from the Amarapura township administrative office.

Primary data are collected by using personal interview. Strength, Weakness, Opportunities, and Threats (SWOT) analysis is used to apply in the study.

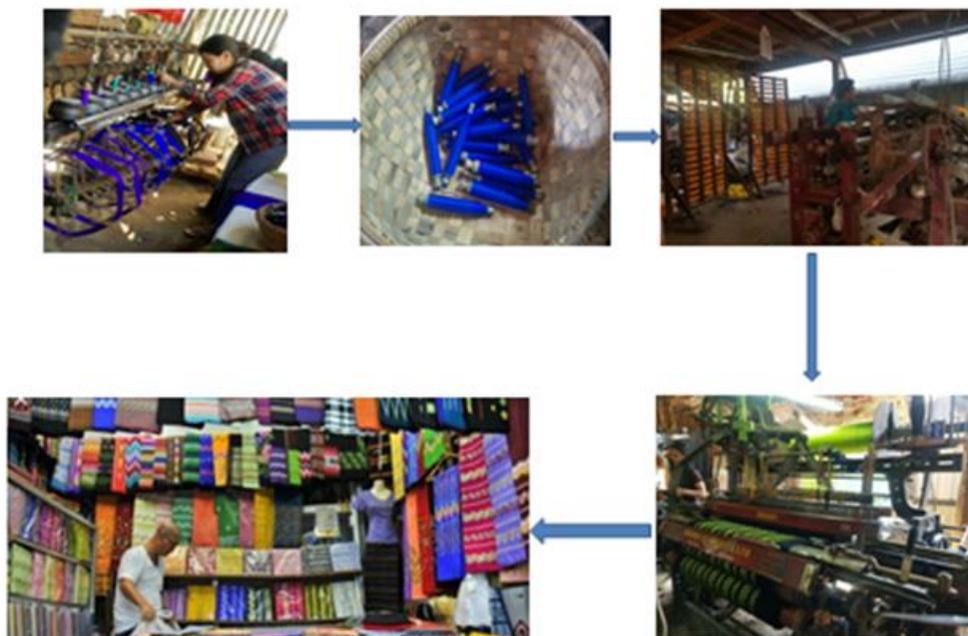
Overview of Loom Weaving Industry

Textile industry is the oldest industry in Amarapura. In development process, the technology for loom weaving is gradually changed from the traditional wood loom to metallic loom. Now it plays an important role in Myanmar Ladies' and Men's fashion in daily life. The survey shows that almost all small scales enterprises still employed old machine and low technology. In recent years, large-scales factories with high-tech are invested in textile industry in order to raise quality of product.

The textile industry of Amarapura is played the crucial role in economics of the township, using 45 % labour force, contribution of 21 % GDP of processing industry and 8.5 % export turn over. Result to carry out business and production show that average raise of textile industry was 4.2 %.

The textile industry only meets the demand of 30 % domestic market, the remaining part distributed from Mandalay. Amarapura has 80% rural resident with low income, to meet the demand of job correspond to income, custom, and living standard are relied on textile industry. Textile products of Amarapura have been export to Thailand and Laos

Processes of Weaving Loom Industry



Source: Photo taken by researcher (10/11/2019)

Photo: Brief processes of weaving loom industry

Environmental pollution of textile industry

Air pollution

Textile industry often uses the boiler in production process. Generated waste is contained particles and SO₂, CO, NO₂. The temperature treatment process and finish process are generated volatile solvents as follows:

- Chlorine vapor generate from bleaching process using NaClO solution - NO₂ generated as using generative dyes (indigosol). This is toxic air and it can causes inflammation of respire for working labour in workshop. The vapor of petroleum which is used in pigment, the vapor of formalin and acid acetate, sulfur vapor and dust of cotton caused as air pollution.

Waste Water

Textile production is one of the most pollution industries. Concerning elements of the textile sector are that it consumes a large volume of water, energy, dyes, textile auxiliary agents and chemicals. Production processing generated a lot of pollutants such as wastewater, waste heat, solid waste. Wastewater is a problem facing textile sector. Wastewater can take place at almost any step of the textile production from preparation of the fiber through finishing of fabric. Quantity and toxicity of wastewater are depended on the types of production processing, dyes used, type of equipment, etc.



Source: Photo taken by researcher (12/11/2019)

Plate 1 Direct dispose of dyed water



Source: Photo taken by researcher (12/11/2019)

Plate 2 Direct dispose of dyed water drains into Taungthaman Lake

The wastewater from the textile industry has high concentration of COD, BOD₅ and very alkali. According to survey document, wastewater of almost all textiles is directly discharged to sewer or stream without any treatment. The Businessman found no use the water treatment system.

Solid waste

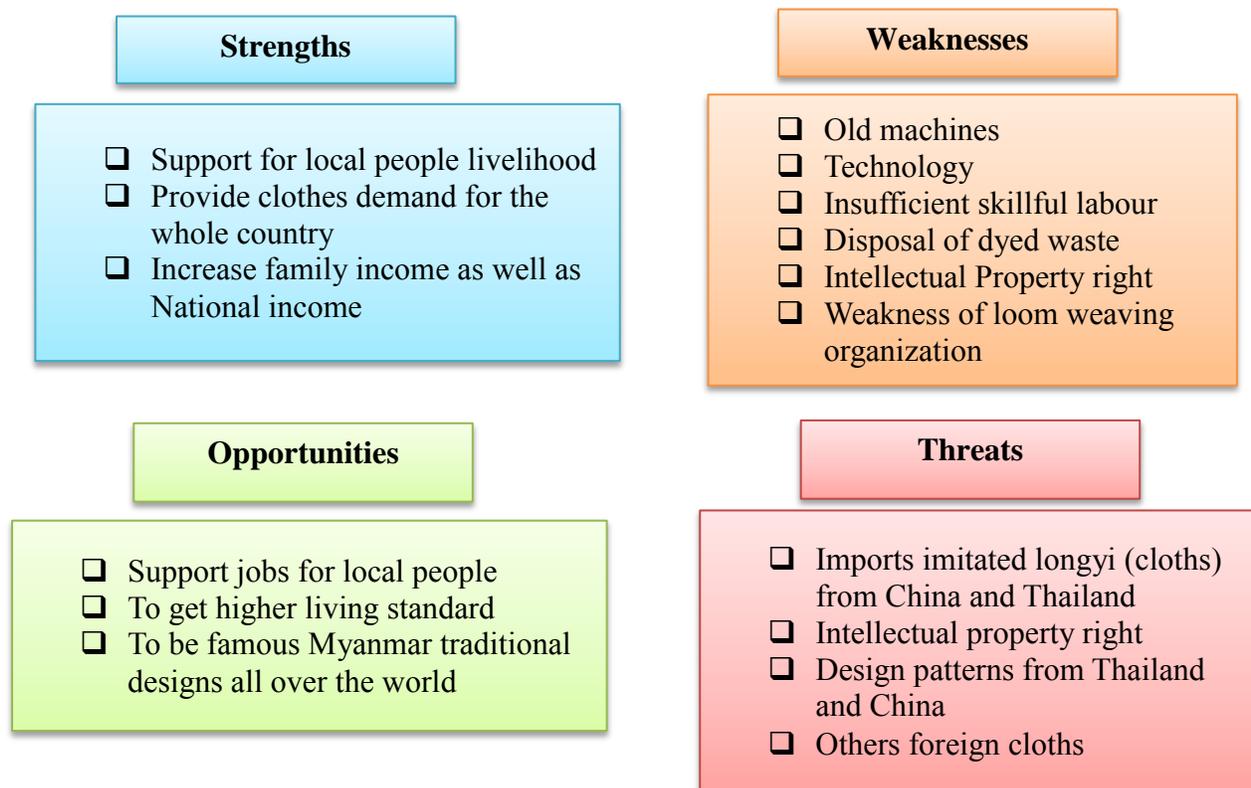
Generated solid waste from operation of textile includes dust of cotton, fabric residues, waste accessories, paper, metal and plastic. Almost all business carried out the environmental impact assessment report or registration form to the local authority. However, they can't compliance with environmental regulations that were mentioned in report. Their wastewater is often discharged directly to municipal sewerage, and stream. The businessmen are almost not considered about environmental problems. The operations of system do not have efficiency to maintain environment. Local authorities have to check the operation of system and need to build water treatment facility.

Environmental legislation

Environmental policy in Myanmar is characterized by a command-and-control system based on regulations and standards. The natural resources and environmental conservation department and city development committee are responsible for environmental monitoring.

SWOT Analysis on the Loom Weaving Industry

The analysis on the loom weaving industry is based on the data from the personal interview to the owners of the industries.



Textile industry in Amarapura will create textile industry many opportunities to expand production and keep up quality of products. Besides, the advantages from the growth of textile sector, environmental problems concerning discharges of wastewater, emission air, noise and waste solid are actually problems to be solved for the textile industry as significant amount of

used chemical, dye, water and energy. End-of-pipe technology has been used for minimize environmental pollution. However, the fee of waste treatment system is to be added the product costs. To build wastewater treatment system is often targeted in order to avoid environmental problems. So, wastewater is often discharged directly to municipal sewerage, and stream without any treatment. These are several causes of extreme environmental deterioration. If the cleaner production program is drawn systemically, all business could be gained benefit for both environmental and economically in protecting environment.

In order to sustainable development for the textile industry, it is needed to build model for the application of an integrated approach. It is required to organize a strong organization for controlling intellectual property right. The industry is required to follow the instructions of waste management, dye limitations and also fair payment of labour. Raw material for loom weaving industry is supported by the government. It would be easy to overcome these difficulties by combination of both government and private.

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