

RESOURCE: TEACHING GUIDE



INTERCONNECTIONS & THE COTTON INDUSTRY

Martin Pluss, Northholm Grammar School

martinpluss@gmail.com | Twitter: @plu

Photo by Jordan Whitfield on Unsplash

INTRODUCTION

Stage 4 Geography comprises the topics Landscapes and Landforms, Place and Liveability, Water in the World and Interconnections. This brief paper will investigate one aspect of Interconnections in the context of the fourth sub point Production and Consumption with a focus on cotton production and consumption. Through this investigation resources will be suggested to help shape the teaching and learning of the syllabus sub-point of this unit of work.

The cotton industry has varied influence on the economies and communities of the developed and developing world. The impact of the industry can be both positive and negative, which at time contributes to different viewpoints of the various stakeholders in the industry. This provides a useful framework for looking at Interconnections as required in Stage 4 of the NSW Geography Syllabus

Interconnections can be drawn out through an investigation of levels of involvement in the cotton industry. These include:

- the *advocates* of the cotton industry and their effort to sustain an industry while engaging in sustainable agricultural practices,
- the *groups and individuals* expressing concerns about high levels of water consumption and the impact on regional drainage catchments like the Murray Darling Basin,
- the *governments* formulating research and policy directions enabling growing farming communities and
- *special interest groups* advocating fast fashion,
- *research think tanks* developing new technologies with the use of drones, AI fashion
- the *people in regional areas* reliant on the industry for their livelihoods.

All these stakeholders are interconnected at many levels.

Cotton plays a significant role in regional areas of Australia particularly NSW in terms of income generation, employment and social cohesion community building. There are some in the wider community who point to the negative, social, economic and environmental impacts of cotton production and consumption while others make the case for the positive social, economic and environmental impacts. It is in this tension where the interconnections are best illustrated.

The following guide will look into resources aligned to the three syllabus sub points of the production and consumption of cotton in Australia and overseas.

- Examination of environmental, social and economic impacts of production and consumption of consumer goods.
- Assessment of the effect of the production and consumption of goods in ONE place or environment.
- Explanation of the responses of governments, groups and individuals to minimise the effects of production in and consumption.

I have kept the number of resources provided per section to six, chosen to reflect a variety of locations, scale, perspectives and detail. The following guide does not endeavour to suggest a pedagogical focus, except to say, it lends itself to individual or group research with the potential for student presentation. I will provide some scaffolds to enable students to research different aspects with a consistent framework.

TEACHING GUIDE: THE COTTON INDUSTRY

GENERAL OVERVIEW

Cotton Australia Industry Overview

<https://cottonaustralia.com.au/industry-overview>

This breaks-down the number of cotton farms in Australia, the characteristics of the average farm, the irrigation requirements, water efficiency and monitoring and much water is used to make a bale of lint.

This site also unpacks the facts and figures of community contribution to the cotton industry including the number of people employed, the percentage cotton makes out of total production, levels of production in good and drought seasons and the main countries to which cotton is exported.

Cotton Consumption

Cotton Consumption on the rise in QLD – <https://www.queenslandcountrylife.com.au/story/5152173/global-cotton-consumption-to-increase-in-2018/>

An article describing the cyclical nature of cotton consumption.

Retail Cotton Consumption –

<https://www.intracen.org/Retail-cotton-consumption/>

The International Trade Centre provides an overview of the world cotton market.

World Cotton Consumption –

https://www.researchgate.net/publication/303484879_World_Cotton_Consumption_Transition_and_Compensation

This academic article from Research Gate links the pattern of cotton consumption to the global economic recession.

Cotton Production

The World Counts – <https://www.theworldcounts.com/challenges/consumption/clothing/world-cotton-production-statistics/story>

Cotton is described as a dirty industry, while the clock adds up the cotton being produced while you read the information.

Top cotton producing countries in the world

<https://www.worldatlas.com/articles/top-cotton-producing-countries-in-the-world.html>

This world atlas indicates the production figures of the top cotton producing countries India, USA and China and then and then works through the other countries.

2020 Australian Cotton Production Manual –

<https://www.cottoninfo.com.au/publications/australian-cotton-production-manual>

This is a report provides an understanding of the cotton physiology, considerations of productivity, profitability, latest research and improvements in best practice.

Student Activity template

	Title, Author & Address	Key facts	Perspective of author	How does resource demonstrate interconnections in the industry?
General Overview				
Resource 1				
Cotton Consumption				
Resource 1				
Resource 2				
Resource 3				
Cotton Production				
Resource 1				
Resource 2				
Resource 3				

TEACHING GUIDE: THE COTTON INDUSTRY

Examination of environmental, social and economic impacts of production and consumption of consumer goods

Environmental impacts of cotton

World Life Foundation–

<https://www.worldwildlife.org/industries/cotton>

This website outlines the world contribution of cotton to production and employment and then outlines impacts in relation to water scarcity, erosion and degradation, pollution.

The world counts –

<https://www.theworldcounts.com/challenges/consumption/clothing/cotton-farming-water-consumption/story>

This website uses a counter showing the tons of water used in cotton production based on 2021, month, week and current day. It outlines how much water is used to produce 10 000 litres of water, compares water loss to a sea, examines the impact of cotton dust, outlines how much virtual water is consumed through cotton clothing and explores the potential of organic cotton.

Fabrics and fast fashion –

<https://www.independent.co.uk/life-style/fashion/fabrics-environment-fast-fashion-eco-friendly-pollution-waste-polyester-cotton-fur-recycle-a8963921.html>

This article outlines the real cost of clothes and the fabrics with the best and worst environmental impact.

Scientific Direct –

<https://www.sciencedirect.com/science/article/abs/pii/S0921344916302828>

This is an academic article which you will be required to access through your library or subscription. It takes a detailed look at the environmental impact of 'recover' cotton in the textile industry.

Cotton Today –

<https://cottontoday.cottoninc.com/cotton-production/>

This is an article suggesting strategies to reduce the environmental impacts of US cotton production.

Managing the environmental impacts of cotton growing – an Australian perspective

<http://www.insidecotton.com/jspui/bitstream/1/3818/2/AAW5%20Presentation%20Paper.pdf>

This is an academic article by the Executive Officer of the Austrian Cotton Growers Research Association. It talks about successful programs partnerships (Interconnections) and provided a bibliography for further research.

Student Activity template

	Title, Author & Address	Key facts	Perspective of author	How does resource demonstrate interconnections in the industry?
Environmental impacts of cotton				
Resource 1				
Resource 1				
Resource 2				
Resource 3				
Resource 4				
Resource 5				
Resource 6				



TEACHING GUIDE: THE COTTON INDUSTRY



Social Impacts of Cotton

Social Impacts of Cotton production –

<https://ergonassociates.net/publication/social-impacts-of-cotton-production/>

This article is by Ergon Associates discussing the social impacts of cotton production for several countries of the world. It outlines how cotton provides employment and is a vital income source for individuals and economies. It also looks into the quality not just the quantity of labour involved in cotton production.

Fashion revolution –

<https://www.fashionrevolution.org/the-role-of-cotton-in-social-and-economic-development/>

This is an article examining the role of cotton in social and economic development. The cotton farmers are an important link in the fashion supply chain. It demonstrates how most cotton farmers live below the poverty line and how a price increase to them might work to improve their lives without increasing the retail cotton price.

How to grow a pair of jeans? –

<https://cottonaustralia.com.au/grow-a-pair-of-jeans>

This shows the step-by-step process of how cotton can end up as jeans with two PDF documents to download.

This indicates another layer in which cotton impacts of social trends via clothes people wear.

Social Impact of Australian Cotton –

<https://australiancotton.com.au/environment-people/social-impact>

The social impacts of cotton in Australia are discussed in terms of supporting family businesses, providing jobs for the bush, building profitability of farmers and facilitating community contributions.

International Case Study –

<https://www.worldbank.org/en/country/uzbekistan/publication/social-impact-of-cotton-harvest-mechanization-in-uzbekistan>

An investigation of the social impacts of cotton harvest mechanisation in Uzbekistan highlights issues such as cotton under a state-ordered system, the number of people who benefit, implications on districts and key recommendations.

Organic Cotton –

<http://aboutorganiccotton.org/social-economic-benefits/>

The perspective of farmers from the world are presented on the social benefits of organic cotton on them and their cotton community.

Student Activity template

	Title, Author & Address	Key facts	Perspective of author	How does resource demonstrate interconnections in the industry?
Social impacts of cotton				
Resource 1				
Resource 1				
Resource 2				
Resource 3				
Resource 4				
Resource 5				
Resource 6				



TEACHING GUIDE: THE COTTON INDUSTRY

ECONOMIC BENEFITS OF COTTON

Partnerships

Dawson Cotton Growers learning from each other –

<https://cottonaustralia.com.au/news/dawson-valley-cotton-growers-learning-from-each-other>

This article investigates cotton growers in Queensland's Dawson Valley

Connecting cotton stakeholders in the cotton industries leadership initiative –

<https://cottonaustralia.com.au/news/australian-future-cotton-leaders-program-participants-announced>

This is a cotton leadership initiative connecting those working in the cotton industry.

Cotton and Fair Trade – <https://www.fairtrade.net/product/cotton>

Some very important basic facts are provided, highlighting the economic impacts on cotton farmers in developing countries who make up 90% of cotton farmers.

Cotton Aid – <http://cottonanalytics.com/category/cotton-and-economic-development/>

This article by Cotton Analytics examines the role of cotton in locations such as India and sub-Saharan regions, the required aid and the benefits.

Cotton, Biotechnology and Economic Development –

https://www.researchgate.net/publication/228275765_Cotton_Biotechnology_and_Economic_Development

This academic article shows how biotechnology improvements have increased production in India and china while in Africa, whose cotton industry has not adopted biotechnology, has had a decline in production.

The economics of cotton –

<https://courses.lumenlearning.com/suny-ushistory1os2xmaster/chapter/the-economics-of-cotton/>

This addresses the important historical background of cotton from the US perspective.

Global Cotton Production hit by slowing economic growth –

https://www.just-style.com/news/global-cotton-consumption-hit-by-slowing-economic-growth_id137639.aspx

A statistical grab indicates the changing nature of cotton consumption

The contribution of cotton to the economy and food security in developing countries –

http://staging.icac.org/Meetings/cgtn_conf/documents/11_fortucci.pdf

This is an academic article which examines revenue contributions, employment contributions, food security contributions, all supported by detailed statistical analysis.



Automatic Sprinkler irrigation system watering in the cotton farm. Maharashtra, India. Source: Shutterstock

Student Activity template

	Title, Author & Address	Key facts	Perspective of author	How does resource demonstrate interconnections in the industry?
Economic impacts of cotton				
Resource 1				
Resource 1				
Resource 2				
Resource 3				
Resource 4				
Resource 5				
Resource 6				

TEACHING GUIDE: THE COTTON INDUSTRY

Assessment of the effect of the production and consumption of goods in ONE place or environment.

Although the syllabus requests ONE case study there is no prerequisite that each student has to do the same ONE case study and as a such a selection of potential case studies are provided both in and beyond Australia. Alternatively, you can pick one of the following for further investigation as a case-study.

There is a selection of resources linked to fluvial environments aka the hydrosphere and following this are some place- based case studies mainly at a regional level. From this introduction at the regional level a specific place can be identified and a mined in more depth.

Case Study: Fluvial environments (hydrosphere) and cotton

Cotton Info –

<https://www.cottoninfo.com.au/publication-type/case-studies>

These case-studies include benchmarking water productivity, managed aquifer recharge, evaporation mitigation and other non-hydrosphere related case-studies.

Bankless channels –

<https://cottoninfo.com.au/publications/case-study-bankless-channels>

This is a case-study of the Cook family of ‘Turkey Lagoon’ near Boggabilla.

Textile effluent treatment: a case-study in home textile zone –

<https://www.fibre2fashion.com/industry-article/2473/textile-effluent-treatment-a-case-study-in-home-textile-zone>

This is an article based on a case-study of the treatment of textile effluent prior to being released back into the hydrosphere.

The water imprint of Cotton Production –

<https://waterfootprint.org/media/downloads/Report18.pdf>

Although this is a 2005 UNESCO report it provides a useful framework for additional student research linking cotton to the environmental aspects of the hydrosphere.

Freshwater and Field Case Studies –

<http://infras.info/downloadpdf.php?filename=b-1215e.pdf>

After a few chapters of synthesis there are a large number of detailed academic case-studies which might need to be scaffolded for the following countries cotton and water – Maikaal, India and Mavideniz and Rapunzel, Western Turkey.

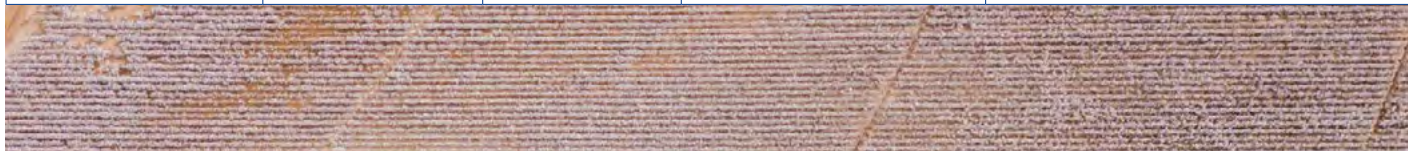
Water Smart cotton and grains in NSW –

<http://npsi.gov.au/projects/3290>

This is a government case study in Australia about the work of irrigators managing the hydrosphere and Cotton.

Student Activity template

	Title, Author & Address	Key facts	Perspective of author	How does resource demonstrate interconnections in the industry?
Fluvial environments – water and cotton				
Resource 1				
Resource 1				
Resource 2				
Resource 3				
Resource 4				
Resource 5				



TEACHING GUIDE: THE COTTON INDUSTRY

Case Study: Place with a regional focus

Southern Cotton in NSW – https://www.business.nsw.gov.au/__data/assets/pdf_file/0014/241340/Southern-Cotton-case-study.pdf

This is a case-study of a place. The focus is on a new cotton gin in southern NSW about the introduction of new technology.

Cotton in the Murray Darling Basin –

<https://www.agriculture.gov.au/sites/default/files/documents/mja-cotton-mdb.pdf>

This Australian Government Department of Agriculture Report was published in March 2020 and comprehensively provides background information, seasonal production, water availability, yield and productivity, enterprise mix, on farm upgrades, employment, the value chain, ginning operations, exports and internal and external factors.

India Case Study – https://www.researchgate.net/publication/268031125_India%27s_experience_with_Bt_Cotton_Case_studies_from_Gujarat_and_Maharashtra

This is an academic report by Research Gate on. Gujarat and Maharashtra in India. If of use it will need to be accessed by your library.

Cotton Production in NSW – <https://www.svcga.com.au/wp-content/uploads/Cotton-factsheet-2016.pdf>

This is a one page fact sheet about cotton in Southern NSW which can be built upon by focussing on a place within southern NSW .

Cotton Production in West Africa – <https://www.oecd.org/swac/publications/38409410.pdf>

This OECD Report examines cotton in West Africa in the international market context, provides a continental overview, demonstrating regional integration with detailed and accessible statistics for a case study.

Cotton Belt USA – <https://agronomag.com/famous-agricultural-areas-world-cotton-belt-usa/>

This case-study focuses on the cotton belt of southern USA examining the future of the region, the history of the cotton belt, factors favouring cotton, and the development of the new cotton belt.

A case-study in Peru – <http://www.nzdl.org/gsdImod?e=d-00000-00---off-0hdl--00-0---0-10-0---0--0direct-10---4-----0-11--11-en-50---20-about---00-0-1-00-0--4---0-0-11-10-0utfZz-8-10&cl=CL2.14.3&d=HASH01c11ddac0d07ee765719caa.2.4>=1>

This article discusses organic cotton cultivation and eco-textiles

Organic Cotton in Peru –

<https://blog.biz.colostate.edu/2018/07/24/exploring-organic-cotton-in-peru/>

This is a case-study which explores organic cotton Peru. It provides good context which can be built upon if further research is of interest.

Explanation of the responses of governments, groups and individuals to minimise the effects of production in and consumption.

The suggested articles and resources provided above represent a reasonable sample of the governments, groups and individuals involved in the cotton industry.

An *explanation* of the responses involves providing insights into the *perspectives* of the governments, groups and individuals. This is the framework which could be used to assist students to understand these perspectives and as such be able to offer an explanation.

The perspective shapes the explanation

For example, Cotton Australia is an organisation who can come to a school to provide the perspective of the individual farmers, building awareness about cotton from the farm to the market and the provision educational resources- see below.

The explanation of the response of Cotton Australia starts with their perspective as an organisation and advocate for cotton and the key stakeholders.

In doing so Cotton Australia strives to address issues, with a balanced perspective It strives to achieve this by demonstrating initiatives to manage negative environmental, social and economic impacts of the cotton industry while highlighting the positive economic, social and environmental impacts of the cotton industry. This is supported by making available case – studies to build awareness, knowledge and understanding of the cotton industry in Australia.

A second example is the Organic Cotton Organisation, whose responses revolve around: advocating for organic cotton and specifically aligning its initiatives to reducing the environmental imprint of cotton production, the promotion of safe work and better livelihoods, providing a model for the future, identifying the impacts on our food system, making the case for a fair price for sustainability and indicating individuals can make a difference.

TEACHING GUIDE: THE COTTON INDUSTRY

Thirdly, explaining the Southern Valleys Cottons Growers Association's responses involve understanding their perspective of the region they represent. This centres around the notion that a collective voice counts, their ability to connect cotton growers, the provision of events, and updates in research such as the use of drones in agriculture, pesticide management, sustainable water initiatives and field days

Fourthly, the World Wildlife Organisation acknowledges cotton provides income for more than 250 million people and employs almost 7% of all labour in developing countries. However, any explanation of this perspective necessarily involves an understanding that their perspective is based on the premise that production methods are unsustainable and perhaps undermining the industry's ability to maintain future production. Some of the above articles suggest organic cotton is the only way forward from a sustainable perspective.

Additional resources from Cotton Australia

Cotton and Sustainability Posters –
<https://cottonaustralia.com.au/posters>

These posters show the sustainable aspects of cotton farming, the story of the field to fashion and a map of the growing areas for both primary and secondary schools.

Cotton Educational Videos –
<https://cottonaustralia.com.au/education-videos>

There are videos on “from seed to sock”, cotton products and uses, meet the grower, know the facts on water allocation, know the facts why is cotton grown in Australia, biotechnology: transgenic versus conventional cotton, solid your undies experiment, cotton harvesting in Australia, the ginning process, the John Deere Round Cotton balers, how does our cotton grow, the beginning with the Cotton Seed Distributors (CSD), breeding a sustainable future, growing the territory – modern cotton, cotton research at the CSIRO



Cotton irrigation, St George, Qld. Source: <https://upload.wikimedia.org/wikipedia/commons/f/f9/StGeorgeCottonIrrig.jpg>

Education Kit –
<https://cottonaustralia.com.au/education-kit>

A comprehensive education kit is available set out in 10 chapters which can be downloaded in the following topics. The resource does have curriculum links and investigates the Australian Cotton industry, sustainable cotton industry, history of cotton, the cotton plant, how cotton is grown, the business of cotton farming, processing from gin to fabric, cotton as a competitive commodity, cotton as a consumer able product and cotton careers.

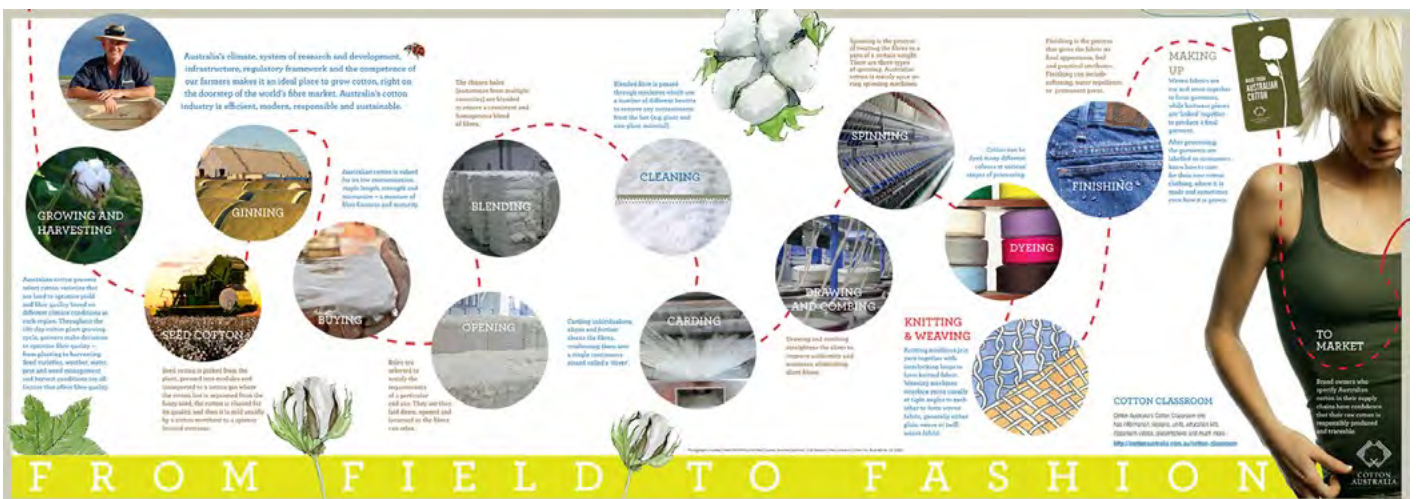
In addition, there cotton activities for lessons in primary and secondary schools – <https://cottonaustralia.com.au/lessons-and-units>

Australian cotton water story –
<https://www.cottonaustralia.com.au/assets/general/Publications/Industry-overview-brochures/The-Australian-Cotton-Water-Story.pdf>

A PDF packed with information logically developing the story

Public Galleries – <https://cottonaustralia.smugmug.com/Public-Galleries>

As the peak grower body showcasing the modern Australian cotton industry, the farms, practices and the technology to are it happen.



Source: https://cottonaustralia.com.au/assets/general/Education-resources/Posters/Field-to-Fashion_Senior-poster-Online.pdf

TEACHING GUIDE: THE COTTON INDUSTRY

CONCLUSION

This provision of resources concerning cotton is not exhaustive and only represents my selection of resources as I tried to align them to the syllabus points for the unit off work Interconnections. In particular the focus was the fourth sub point production and consumption.

This was further broken down into the three sub points examine it social, economic and environmental impacts, explanations of responses of governments, groups and individuals by focusing on their perspectives and suggested examples of case- studies for the fluvial environments connected to the cotton industry; and a selection of regional case studies from which specific places could be chosen for further research.

Many industries of production and consumption are closely interconnected with a range of close and extended stakeholders. The cotton industry is no exception.

Although no specific pedagogical approaches have been suggested the focus here is to provided resources with scaffolds to build a depth of knowledge leading understanding, consistent with the recent NESA Curriculum Review.

Individual geography teachers are empowered to use their professional judgement as to how access to resources, identify individual student learning needs, facilitate individual or group collaboration and presentations and take into account their environmental and cultural context of their school community.



This poster shows the perspective of the cotton Industry on the sustainability of Cotton Farming. Source: <https://cottonaustralia.com.au/assets/general/Education-resources/Posters/Sustainable-Cotton-Farm-A1-Poster-Primary-Online.pdf>

