# **GEOGRAPHY BULLETIN**





Geography Teachers' Association of New South Wales Inc.

### Volume 49 No 3 2017

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### **GEOGRAPHY BULLETIN**

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Geography Teachers' Association of New South Wales Inc.

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Front cover: Natural resources: Leather. Image: L Chaffer Back cover: Illegal sand mining operation, Mumbai. Image: Sumaira Abdulali. Source: https://commons.wikimedia.org/wiki/File:Child\_labour\_in\_sand\_mining.JPG

The Geography Bulletin is a quarterly journal of The Geography Teachers' Association of New South Wales. The 'Bulletin' embraces those natural and human phenomena which fashion the character of the Earth's surface. In addition to this it sees Geography as incorporating 'issues' which confront the discipline and its students. The Geography Bulletin is designed to serve teachers and students of Geography. The journal has a specific role in providing material to help meet the requirements of the Geography syllabuses. As an evolving journal the Geography Bulletin attempts to satisfy the requirements of a broad readership and in so doing improve its service to teachers. Those individuals wishing to contribute to the publication are directed to the 'Advice to contributors' inside the back cover. Articles are submitted to two referees. Any decisions as to the applicability to secondary and/or tertiary education are made by the referees. Authors, it is suggested, should direct articles according to editorial policy.

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# GEOGRAPHY BULLETIN

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### **EDITORIAL**

Welcome to the third issue of the GTA NSW bulletin for 2017. This issue continues to support teachers implementing the new Geography K–10 Syllabus as well as teaching the existing Stage 6 syllabus.

A new section in the Geography Bulletin titled Professional Reading provides background reading relevant to all Geographers. The two pieces in this edition are blog entries from GEOawesomeness, "a blog about geospatial technologies and everything awesome around it" that the website refers to as the geo – industry. These blogs are written by experts in the Spatial Technologies industry.

- 'Five GIS trends changing the world' by Jack Dangermond, President Esri Inc.
- 'How drones are being used in disaster management' by Lia Reich, Precision
  Hawk

For further information and reading teachers can visit – http://geoawesomeness.com

A big thank you to Dr Susan Bliss for several articles in this edition. These articles can be integrated into many areas of study from Stages 4 to 6 and demonstrate the interconnections between people, places and environments. The following articles focus on natural resources, their production and consumption, the environmental, social and economic consequences of their exploitation, connections between places, and human wellbeing.

- 'Sand Mafia in India'
- 'Child Labour in India's Mica mines'
- 'Skin Deep: Bangladesh leather'

Fiona Nicholson and Betty Steele-Smith have written reflections on the *GTANSW* Annual Conference held in March. Fiona and Betty attended through their successful application for a bursary / scholarship from GTANSW and the Murray Darling Basin Authority.

In '*Place and Liveability: Teaching ideas Part 2*' I have incorporated a selection of slides from a conference presentation given at the AGTA Conference in New Zealand in 2015. Part 2 focuses on assessing and enhancing the liveability of places as well as the use of geographical tools to investigate liveability.

Two new resources are reviewed in this edition, one for primary and the other for all Geography teachers.

For primary teachers, the new resource from Central Coast Council is a multi touch ebook on wetlands with accompanying teaching programs for K–6 Geography and Science. A sample teaching activity for Stage 3 and relevant weblinks is included.

For all teachers the National Geographic Geo-inquiry resource marries nicely with the concept of geographical inquiry in the NSW Geography K-10 Syllabus.

### **CONTRIBUTE TO THE GEOGRAPHY BULLETIN**

The editor would like sample Assessment Tasks and Fieldwork Activities from teachers of the new K–10 Syllabus for Edition 4.

Please email to: The Editor,The Geography Bulletin at gta.admin@ptc.nsw.edu.au



Lorraine Chaffer, Editor



### **SEMESTER 2 EVENTS**

### **Regional Conferences**

Tamworth – Friday 28 July at the Quality Powerhouse Hotel, Batemans Bay – Friday 4 August Batemans Bay Soldiers Club,

### **GIS in Schools**

(An exclusive professional learning event for GTANSW members) Thursday 24 August at St Aloysius' College, 47 Upper Street, Kirribilli

### AGTA / GTA NSW Geography Skills Roadshows

Sydney – Thursday 21 September at Novotel, 11a Olympic Boulevard, Sydney Olympic Park

Newcastle – Friday 22 September at Crowne Plaza Hotel Cnr Wharf Rd and Merewether Sts, Newcastle Registrations now open at http://www.gtansw.org.au

#### Webinars

Two per term – Tuesday 15 August and Wednesday 13 September, 4.00pm –5.00pm. These webinars assist Geography teachers implement the new K–10 syllabus. The focus is on pedagogy, skills and ICT.

Flyers will be emailed to members and on the website soon.

#### HSC Geography Teachers' Conference

Monday 6 November at NSW Teachers Federation Conference Centre, 37 Reservoir Street, Surry Hills (walking distance from Central Station) Flyers will be emailed to members and on the website soon.

#### Arthur Phillip Awards: Geography Fieldwork Competition

Entries close Friday 24 November 2017. Download a competition brochure and registration forms at http://www.gtansw.org.au

#### **The Geography Bulletin**

Issue 4 – Late Term 3: Focus on Coffee – Biome and Interconnections

Special HSC Edition 2 of The Geography Bulletin – Late Term 3. Articles will include Urban Places Fieldwork (Sydney and Melbourne), Coffee as an Economic Activity using syllabus headings.



Sharon McLean welcomes over 40 teachers to the Tamworth . Photo: L Chaffer



### SYDNEY: Thursday 21 September 2017 – Novotel, Sydney Olympic Park NEWCASTLE: Friday 22 September 2017 – Crowne Plaza Hotel

#### COST: Members \$240 Non-Members \$260. REGISTRATION: CLICK HERE

The 2017 AGTA/GTA NSW Geography Skills Roadshow will focus on the tools and skills mandated by the new NSW Geography Syllabus Years 7–10. AGTA, in association with the Geography Teachers Association of New South Wales (GTA NSW), has developed a professional learning program that guides teachers to a more advanced understanding of the tools and skills central to Geography's inquiry-based methodology. This is a hands-on professional learning experience. Participants will be actively engaged in a series of activities that develop key understandings and competencies.

The program below has been designed into three streams:

- Geography Skills for secondary teachers new to teaching geography who have little, if any, academic background in the subject.
- Geography Skills for experienced secondary geography teachers with an increasing focus on using ICT
- Geography Skills specifically designed to meet the needs of Primary teachers.

#### The Presenters include:

**Grant Kleeman** is one of Australia's leading geography educators. He has been closely involved in curriculum development at a state and national level for more than 25 years. Grant has written more than 40 Geography textbooks and numerous peer-reviewed articles. He is the Immediate Past Chair of AGTA and recently retired as Director, Teacher Education at Macquarie University– Sydney. In 2007, Grant was awarded the McDonald Holmes Medal for his 'Distinguished contribution to Geographical Education in Australia'. Grant was the Project Coordinator of *Geography Skills Unlocked* and author of the highly successful Cambridge University Press series of topographic mapping texts.

**Rebecca Nicholas** of Contour Education is Head of Humanities at Brisbane State High School. She is a highly experienced innovative Geography teacher who has always had a keen interest in incorporating technologies in the Geography classroom. Rebecca was a member of the Advisory Board for the development of the Australian Geography Curriculum and was a contributor to GeogSpace.

**Lorraine Chaffer** has taught in a variety of schools for the Department of Education where she held the positions of Head Teacher Social Science, Head Teacher Administration and Head Teacher Teaching and Learning. Lorraine was also invited to be a member of the NSW Consultation Committee on new Australian Curriculum re Geography in NSW. Her commitment to Geography Education is exemplified by her long term involvement in the Geography Teachers Association NSW as councilor, Vice-President and the newly elected President for 2017. In her role as co-editor and editor of the *Geography Bulletin* Lorraine is committed to providing current, relevant and practical information for teachers and students. Lorraine's contribution to the Geography Bulletin has been prolific.

**Sharon McLean** is a graduate of Sydney University, has taught History and Geography in a variety of educational contexts. Most recently, Sharon was Head of Geography at Sydney's Saint Ignatius' College. During her teaching career, Sharon was the Convener of the NSW Catholic Trial Examination Committee and also a member of the Geography Teachers Council. Sharon is a recipient of the Geography Teachers Association Brock Rowe Award for Teaching and the NSW Professional Teachers' Council award for services to Geography. Sharon is currently a Vice-President of GTA NSW. Sharon works closely with Primary teachers throughout NSW to facilitate the introduction of Geography P–6.

**Susan Caldis** is an experienced Geography educator who places great emphasis on the role of fieldwork and inquiry-based methodologies in bringing Geography to life for her students and colleagues. After leading the development of the Australian Curriculum: Geography at ACARA, Susan returned to a Head Teacher HSIE position and then transitioned in to convening and teaching Geography Methodology and HSIE Education units at Macquarie University. In June 2017, Susan was awarded a university scholarship to commence her doctoral studies. Susan received the PTCNSW Outstanding Professional Service Award in 2015.

Session details over the page...

# **GEOGRAPHY SKILLS ROADSHOW**

PROGRAM

SESSION	GEOGRAPHY SKILLS FOR TEACHERS NEW TO THE TEACHING OF GEOGRAPHY	GEOGRAPHY SKILLS FOR EXPERIENCED GEOGRAPHY TEACHERS	PRIMARY TEACHERS	
8.30am	REGISTRATION			
9.00am – 9.15am	Geography's tools and skills: An overview of the relationship between Geography's tools and skills and the subject's inquiry based methodology. [Grant Kleeman]			
9.15am – 10.00am	<b>Topographic mapping skills:</b> In this session participants examine the role of maps in the Geography classroom. It includes an examination of the types of maps used, elements of maps, map symbols, direction, scale and distance, grid and area references, and latitude and longitude. [Grant Kleeman & Lorraine Chaffer]	ICT-based tools and skills: This session introduces participants to entry-level geospatial technologies. [Rebecca Nicholas]	<b>Fieldwork:</b> This session explores the role of fieldwork with specific links to the NSW Geography Syllabus K-6. The practical component of the workshop demonstrates key fieldwork strategies suitable for students in K–6. There is a special focus on ICT-based fieldwork tools. Finally, we examine the role of virtual fieldwork technologies and approaches. [Susan Caldis]	
10.00am		MORNING BREAK		
10.30am – 12noon	Topographic mapping skills (continued): In this session we focus on working with topographic maps. Skills addressed include: locating features; representing topography; relief and gradient; measuring distance and area; cross-sections; and transects. [Grant Kleeman & Lorraine Chaffer] Weather and climate: In this part of the late morning session we focus on the interpretation of weather maps and climate graphs. [Grant Kleeman] Working with photographs: Ground and aerial photography. Creating digital images and photo sketches. [Lorraine Chaffer] Specialist maps: In the early afternoon session participants will work with choropleth maps, isoline maps, proportional symbol maps, cartograms and flowline maps. [Lorraine Chaffer]	ICT-based tools and skills (continued): In this session participants examine the range of pedagogies used to develop students' mastery of Geography's tools and skills. We go beyond the basics to explore the range of web-based applications and resources used in classrooms to engage students and enhance their understanding of the key geographical concepts. [Rebecca Nicholas]	Geographical inquiry: This section introduces participants to the stages of an inquiry in Geography – observing, questioning and planning; collecting, recording, evaluating and representing; interpreting, analysing and concluding; communicating; reflecting and responding; and organising data in an inquiry. [Sharon McLean] Maps and mapping: In this session participants examine the role of maps in the Geography classroom. The session includes: an examination of the types of maps used; elements of maps; map symbols; direction; scale and distance; grid and area references; and latitude and longitude. [Sharon McLean]	
12.30pm	LUNCH			
1.15pm – 2.00pm	Working with diagrams: In this final session participants engage with the range of diagrams typically used to communicate geographical processes. [Grant Kleeman] Working with statistics and graphs: In this session participants examine the role of bar charts, multiple bar charts, divergent bar charts, histograms, line graphs, multiple line graphs, cumulative line graphs, proportional graphs, scatter graphs, ternary graphs and infographics. [Grant Kleeman]	Fieldwork: This session explores the role of fieldwork with specific links to the NSW Geography Syllabus – Years 7–10. The practical component of the workshop demonstrates key fieldwork strategies suitable for students in Years 7–12. There is a special focus on ICT-based fieldwork tools. Finally, we examine the role of virtual fieldwork technologies and approaches. [Rebecca Nicholas]	Weather and climate: In this part of the late morning session we focus on the interpretation of weather maps and climate graphs. [Sharon McLean]	
2.00pm	AFTERNOON BREAK			
2.15pm – 3.00pm	<b>Fieldwork:</b> This session looks at the role of fieldwork in Geography with specific links to the new NSW Geography syllabus. The practical component of the workshop demonstrates key fieldwork strategies suitable for students in Years 7–10. [Susan Caldis]	ICT-based tools and skills: In this session we focus on the use of social media in the Geography classroom. Fifty strategies and counting! [Rebecca Nicholas]	ICT-based tools and skills: This session introduces participants to the range of ICT- based tools that can be used in the Primary classroom. The tools examined include entry level geospatial technologies, the applications of GIS; the internet and social media. [Sharon McLean]	

### Five GIS Trends Changing the World



2017

Maps are a simple and efficient way to understand and communicate rapidly. Looking at a spreadsheet, we see rows and columns of data. Using charts and graphs, that data can be seen as a pattern. But when that same data is presented on a map, we suddenly have context for the information. Because most of us are already familiar with geography, when we see data as a map it is usually understood much faster. We are now at a stage where we can display 3D imagery and information on the web very easily. Web-based 3D visualizations are everywhere, and maps are among the most common manifestations of this.

At Esri, we are investing in things our users want at scale, while still keeping abreast of the cutting edge. The geospatial industry is quickly evolving because the capabilities of digital connectedness and collaboration are moving ahead exponentially. In fact, the five biggest trends in the area of geographic information system (GIS) technology are centered on making data more accessible and creating context to visualize this data in an age when fast, easy access to information is taken for granted.

### 1. Location as a Service

There was a time when GIS use was limited to the niche market of government, telecommunications, utilities, and oil and gas sectors. That market has grown substantially, as large retailers and tech startups have seen the benefits of understanding data geospatially. The fundamentals of GIS and what it can do have also evolved dramatically. We are entering an era of services-based GIS. This means the GIS professional connects with consumers directly through web-based applications that provide easy-to-access visualizations. GIS also has huge implications for the enterprise user at a business or a city organization, where departments have enormous amounts of geographic data. Performing spatial analysis on the web and having access to distributed servers where different layers of data exist allow users to bring this data together, fuse it, and analyze it across the network.

**Jack Dangermond** 

January 1, 2017

Original article: http://geoawesomeness.com/ five-gis-trends-changing-world-accordingjack-dangermond-president-esri/

### 2. Advanced Analytics

Spatial analysis is important to any business that values location as a variable to success. Site selection is a crucial function that is dependent on geospatial analysis. A retailer that wants to set up new stores needs to understand where there are existing successes for similar ventures as well as hospitable demographics. All this data can be overlaid onto a map to perform statistical analysis in order to make a decision about the location of a new store. Maps communicate this information well, and in a web services environment, professionals will be able to make maps, graphs, and charts and perform analytics easily. Accessible from an organization's cloud, the power of GIS and mapping is opened up across the enterprise.

### 3. Big Data Analytics

The ability to access the vast amounts of data that provide us with insight into the environment and human behavior has changed the way all organizations function. That capability has also evolved to include the integration of big data operations into spatial analysis. Today, anyone in the enterprise can access billions of environmental observations or tens of thousands of raster images from spacecraft and analyze them easily. This will greatly expand what traditional GIS has done. Enterprise users can now build their own imagery and raster analytics workflows for fast, multi-CPU, parallel processing of massive imagery collections.

### 4. Real-Time GIS

The world of citizens and consumers is already interconnected digitally—people are connected with each other and with their governments and businesses. Leveraging this vast network of devices and sensors is perhaps the latest trend and the number one priority for organizations that want to remain ahead in terms of having a comprehensive enterprise GIS for the future. Everything from smartphones to crowdsourced social media feeds is being used to integrate real-time data from the Internet of Things (IoT) directly into a GIS layer stack, where the data is analyzed, visualized, and

reintegrated into online applications for use by either professionals within the enterprise or by consumers and citizens.

### 5. Mobility

Another way GIS is breaking out of its traditional space is by becoming more consumer-friendly. Just as data from mobile devices is liberating professionals and consumers who've been accessing GIS online and from the desktop, this same data is being used to power a new generation of easily accessible applications that tap into the rich science and analytics that only GIS can deliver. A much simpler user experience is now possible for GIS users with the creation of a suite of apps and app builders. iPhones or Android devices can be used to collect geospatial data or explore it visually, anywhere and at any time. Professionals in the field can use these apps for data collection or as observational data, which they can then bring directly into an enterprise services environment in the cloud. Field information is immediately input and analyzed.

### Creating Big Understanding from Big Data

The last leap in computing was the shift from the server to the cloud. Software as a service (SaaS) opened up a world of opportunities for GIS, as shared map services like the *World Imagery Basemap* are no longer separate from the unique services offered to users. GIS users can share data, collaborate, make mashup maps in the server, then connect to the cloud.

The next leap in GIS technology and computing is connecting to the vast network of devices providing data in real time. It is the most revolutionary change we have seen since Esri began and brings great opportunity. The more accessible data is, the more important it will be to understand it. And maps are the visual language for understanding the context of data.



SOURCE: http://geoawesomeness.com

### How Drones are being used in Disaster Management

### Lia Reich

1.2 million deaths. 2.9 billion people affected. \$1.7 trillion in damages. According to data from the United Nations Office for Disaster Risk Reduction, these staggering figures are the total economic and human impact of global disasters from 2002 to 2012. With a steady growth in annual disasters, especially climate-related ones, emergency management strategies are being put under the microscope. Disaster management technologies, on the other hand, have seen some remarkable breakthroughs in the past decade.



Infographic prepared by the United Nations Office of Disaster Risk Reduction

January 26, 2016 Original article: http://geoawesomeness. com/drones-fly-rescue/



PrecisionHawk's Lancaster

### How drones fit

Many technological breakthroughs in recent years have emerged in places areas where it was least expected. Unmanned aerial systems, for example, have transitioned from highly defense-focused applications to a multitude of commercial use cases that transcend industries. But what makes UAS, more commonly referred to as drones, fit for emergency response?

As previously discussed, aerial views are critically helpful in large-scale disaster zones. Drones, designed to be agile, fast and robust, empower response teams with a substantial upper hand without costing as much as manned flight operations. Because many are autonomously flown, drones can access hard-toreach areas and perform data-gathering tasks that are otherwise unsafe or impossible for humans.

### Hurdles in traditional methods

Many disaster management protocols have been tested over the years. While many of these strategies have been successful, they also come with major hurdles. Time is the most important commodity in disaster response. Emergency responders know very well the irreversible consequences of critical delays, so their playbooks are inherently designed to address urgent, high-pressure scenarios. On top of urgency, disaster response faces another major challenge in logistics, as evidenced by the 7.8 magnitude earthquake in Nepal that claimed the lives of 9,000 people and injured 23,000 others.

As debris and rubble piled up on the streets following the biggest natural disaster in the country since 1934, most of the roads were blocked, denying access to outlying areas. In situations like this where land access is off the table, government agencies are forced to deploy manned aircraft to continue immediate search and rescue, and later on, relief efforts. In theory, this sounds like a winner, but resource allocation, especially in poorer countries, poses another major challenge. Search and rescue operations from the air are expensive, and as we've seen in the past, these operations can stretch for months, even years. In countries where resources are already scarce, this option is not viable.

Outside of these safety concerns, there's another major hurdle that is often overlooked: first responder safety. In the case of earthquakes, landslides, hurricanes and wildfires, first responders are deployed immediately in rough and dangerous working conditions. In 2014, a mudslide roared through the rural community of Oso, Washington, destroying over 30 homes and taking the lives of 43 residents. The response team had to move quickly. The risk of another mudslide was looming over them, while the first one dammed the river and flooded the valley, essentially turning the entire disaster zone into quicksand. Given all these uncontrollable elements, it was not safe for the ground crew to investigate the scene. To make things worse, only 30 minutes of clear skies were left for helicopters to conduct an aerial survey - not enough time to gain an accurate account of what was happening on the ground. The team did, however, have a drone.



3D terrain reconstruction of the Oso mudslide zone created using PrecisionHawk's software arm, DataMapper

Immediately following the Oso mudslide, PrecisionHawk, an information company out of Raleigh that manufactures a drone for data collection and software for processing and analysis, was called in through involvement with Roboticists Without Borders (RWB) to provide geologists and first-responders with actionable insights. Using their Lancaster UAV platform, PrecisionHawk surveyed the terrain from the air to create an 3D map. RWB's Dr. Robin Murphy recently told CNN, "[The UAV] acts like a plane. It's smarter than a plane because it's got all sorts of onboard electronics to let it do pre-programmed surveys. It takes pictures like on a satellite or a Mars explorer and then pulls those back together into a hyper-accurate map — a 3D reconstruction."

In Oso, PrecisionHawk used high fidelity sensors and intelligent back-end software to reconstruct and analyze the terrain in 3D — a step that not only helped geologists detect the pace of land movement but also provided first responders the time-sensitive data they needed to safely infiltrate the disaster zone. This all happened in a matter of hours. Historically, emergency response teams used manned LiDAR flights and satellite information to gather such data, actions that are costly and take days to weeks to accomplish.

Beyond economic and logistical advantages, drones currently on the market are often equipped with intelligent flight planning software that allows first responders to easily create highly customisable flight paths that focus on specific areas of interest, leading to organised and focused search efforts.

Beyond economic and logistical advantages, drones currently on the market are often equipped with intelligent flight planning software that allows first responders to easily create highly customisable flight paths that focus on specific areas of interest, leading to organised and focused search efforts.

Additionally, drones are also outfitted with various sensor options that include visual, thermal, LiDAR, hyperspectral and multispectral. Why are these important? In earthquakes and landslides, these sensors can be flown to conduct ground truthing surveys. The thermal sensor, for example, is perfectly suited for detecting the heat a human body emits, which helps locate survivors. Various sensors suites are efficient in obtaining data to create an exact 3D reconstruction of disaster zones, which when compared with historical data from satellites, offers new perspectives on the extent of damage, and terrain or field deviation that could help manage future disasters.

With the advent of UAVs in emergency response, it is important to note that commercial drones operated by professionals and emergency organisations do not offer the same applications as hobby drones recently seen disrupting wildfire containment efforts. Commercial UAV platforms are designed with the on-board intelligence to empower, not deter. In order for drones to become a vital part of emergency management, hobbyists need to avoid irresponsible use cases that overshadow the massive benefits of UAV technology and manufacturers need to continue to inbuild tools that promote safety.

### Data analysis - beyond hardware



PrecisionHawk team with Texas A&M University's Dr. Robin Murphy at the Bennett Industrial Landfill in Lockhart, SC

Advanced data analytics are the next frontier in leveraging drones for emergency response. One of the advantages of solution-focused algorithms is the ability to apply them across industries from emergency response applications to agriculture to energy, even identifying toxic waste in the air in real-time.

In mid-February last year, PrecisionHawk was issued an emergency COA to conduct an aerial survey over the Bennett Industrial Landfill in Lockhart, South Carolina. Toxic particulates were being released into the air, including asbestos and other potentially harmful chemicals, so it was crucial that the Environmental Protection Agency (EPA) assess the situation guickly.



VIDEO LINK: https://youtu.be/qc6cAZ1J1Ss

The EPA, however, could not obtain an accurate volumetric survey of the area due to an active fire affecting some sections of the landfills, plus chemical exposures that made the scene unsafe for ground surveyors. To address the situation, PrecisionHawk flew a drone to create a 3D reconstruction of the site and conduct volumetric analysis to help the EPA determine an appropriate response.

The demand and desire for this type of technology to assist in emergency response is apparent as disaster response teams search for strategies to accomplish tasks easier and more efficiently. The convergence and advancement of technologies, including unmanned aerial systems, will grant first responders with enormous opportunities to save more time, money and lives.



Drone exhibition, New York City. Image: L Chaffer



# **NATURAL RESOURCES**

## SAND MAFIA IN INDIA

### Dr Susan Bliss Educational consultant Author, Macmillan Australia



### **Geography Syllabus Links**

- Landscapes and Landforms: Humans change rivers, coasts and ocean beds
- Environmental Change (Stage 4) and Management (Stage 5)
- Urbanisation (Stage 5 & 6)
- Interconnections (Stage 4)
- Natural Resources (Stage 6)
- Cross- curriculum priorities: Asia, Sustainability

### Sand dubbed India's 'new gold'

The construction industry is India's largest economic sector accounting for 7.8% of the country's GDP and the second largest employer. The high rate of urbanisation and urban growth has accelerated the growth of the construction industry especially in cities such as Mumbai accommodating 12.5 million inhabitants, and Delhi 11 million. Over the last 10 years, these cities have experienced one of the fastest rates of urbanisation in the world with Delhi's population rising by 4.1% and Mumbai's by 3.1%. By 2030, 41% of India's population is anticipated to reside in urban areas necessitating homes, roads, shopping malls and windows-all dependent on the basic ingredient 'sand'. However, currently 19 million urban dwellers in India lack adequate housing.

The Indian construction industry involves 40 million people and is valued over \$126 billion per annum. Investment in the construction industry needs to increase to 10% of GDP if India is to continue to grow economically. This will entail construction materials such as sand, stone and clay, for infrastructure projects to build new towns, skyscrapers, flyovers, airports and increase number of highway lanes.

India's Prime Minister Narendra Modi, plans to develop 100 smart cities under a '*new Chicago every year*' slogan. The speed of construction is concerning. Does India have sufficient sand for this development? What will be the impacts on environments?

### Sand mafia: dark secrets of India's booming construction industry

### Illegal sand mining is everywhere. Laws and inaction contribute to problem

The world is running low on sand and pillaging sand is a growing global practice. '*The construction-building industry is the largest consumer of this finite resource. The traditional average-sized house requires 200 tons of sand; a hospital requires 3,000 tons of sand; each kilometre of highway built requires 30,000 tons of sand; and a nuclear plant, a staggering 12 million tons of sand'* 

Adapted http://coastalcare.org/2016/08/sand-scarcity-hits-mumbais-first-artificial-beach-project/

Currently India's, legal supplies of sand are unable to catch up with rising demand. For example, in Mumbai, the booming construction industry takes place 24/7, causing hungry developers to resort to cheap deliveries from 'sand mafias' who are pillaging millions of tonnes of sand from beaches, rivers, lakes and ocean beds. Concrete construction and plastering prefers fine quality sand, shaped by water rather than wind. As a result India's waterways such the Yamuna River faces devastation – not the deserts!

India's sand mafia are corrupt and deadly:

- Corrupt politicians, bureaucrats, contractors and police, create a powerful nexus capable of deterring community based resistance to the sand mafia. In fact they support the exploitation of the country's booming construction industry by the sand mafia that generates \$19 million a month.
- Death, violence and kidnapping occurs when activists try to halt this illegal practice. For example in Noida an outer suburb of New Delhi, 52-year-old Paleram Chauhan was shot dead when he fought to save village land from being stripped of sand. 'The dangerous sand mafia stops at nothing. It kills, runs over men in uniform, kidnaps and, in Uttar Pradesh, even molests and rapes. Its impunity stems from the fact that complaints lodged with police often remain confined to files'.

Source: http://www.hindustantimes.com/india/inside-the-worldof-sand-mafia- terror-casts-gloom-as-cops-bury-heads/storyi0Z1p2jE3dt4uMfLWtUmKO.html



Sand miners, the Thane River near Mumbai, (ABC Foreign Correspondent) Image source: http://www.abc.net.au/news/2017-03-28/the-great-sandheist-fuelling-india-120-billion-building/8390984

ABC Foreign Correspondent travelled to the drought-stricken Bundelkhand region in central India to film the sand mafia stealing sand. The theft of sand varies from high tech dredging, digging with bare hands, to free-diving.

On Mumbai's Thane River, local fishermen plunge to depths of 15 metres to gather sand from the riverbed. With no safety apparatus and up to two minutes of air in their lungs, they fill a tin bucket with black muddy sand. The men are often drunk as it is the only way they can calm their nerves to succeed in filling the bucket up to 200 times a day.

Adapted source: http://www.abc.net.au/news/2017-03-28/the-greatsand-heist-fuelling-india-120-billion-building/8390984

### Thane Creek, near Mumbai

**Thane, India** – Every morning as the tide ebbs, Pralath Matre dives deep into a filthy creek not far from Mumbai to gather a bucketful of dark sand - a much-needed ingredient for the construction boom. Matre, 42, dives 300 times every day in the 15 metre-deep waters. He earns 800 rupees (\$13) a day, but the cost is much higher. The heavily polluted sea has caused infections in his nose, eyes and skin, and affected his hearing.

It's a scene that's playing out not only at this creek, but at dozens of other places around India

Adapted: http://www.aljazeera.com/indepth/features/2015/02/india- citiesplan-environment-included-150223090301305.html

Workers at illegal mine on Thane Creek dive to bottom with a metal bucket to scoop sand. The boat crew hauls the sand to the surface.



Photo source: https://www.wired.com/2015/04/adam-ferguson-illegal-sandmining/#slide-15

Sand Mining Belt – Over 100 trucks are loaded with sand from Thane and the other locations on the map, and transported to Mumbai daily



Source: http://images.mid-day.com/images/2015/jul/Sand-Mining.jpg

### Workers wash Thane Creek sand before trucking it away



Source: https://www.wired.com/wp- content/uploads/2015/03/AF\_ India\_2015\_00660.jpg

### Illegal sand mining process

Sand is precious to the real estate industry and as a consequence the sand mafia ravages riverbeds, coastal areas and land with heavy equipment used to dredge up tonnes of earth to sell at steep discounts to builders.

Step one: Sand mafia take barges into rivers, lakes and oceans, and using a suction pump, extract sand from rivers and the sea bed

Step two: A barge carries up to150 brass of sand, extraction takes up to two hours

Step three: Sand is stored at reti bunders (sand godown, storehouse, warehouse)

Step four: Sand mafia sells sand to a middleman who then sells it to the builder

#### Mining coastal sand dunes



Image source: http://coastalcare.org/wp-content/uploads/2013/07/beachsand-mining-maroc.jpg

Image left – source: https://cdn.theconversation.com/files/173878/width754/ file-20170614-15456-1nv2bsf.jpg

#### Legal versus illegal sand mining

Indian currency –	lian currency –      *Rs (Rupees)		
	Legal	Illegal	
Cost of one brass of sand (1 brass = 4,528 kg)	Rs 15,000	Rs 8,000	
Amount builder pays for one truck of sand	Rs 50,000	Rs 35,000	

### **Death to activists**

IAS officer D. K. Ravi, who helped expose tax frauds by several top real estate firms in Bengaluru and tackled the sand mafia head-on in rural Karnataka, was murdered.



Cartoon source: https://s-media-cache-ak0.pinimg.com/564x/bf/c3/af/bfc3af 424ed4626274e31a0e08d9c454.jpg

### Summary: Impacts of illegal sand mining on Indian rivers and coasts

- Loss of biodiversity e.g. fish, turtles and birds like the rare Indian Skimmer
- **Decline in land** Inland and coastal areas and sand islands which leads to ...
- Decline in protection against extreme events River floods, coastal storm surges
- Change in hydrologic functions Water flows, flood regulation and marine currents
- Change in water supply –Lowering water table and water pollution
- **Damaged infrastructure** Bridges, river embankments and coastal infrastructure
- Change in landforms and landscapes Coastal and river erosion, changes in coastal deltas, construction of quarries



### **Stealing a river**

Extensive sand mining has damaged the delicate ecosystem of India's rivers, on which millions of people depend on for their drinking, livelihoods and irrigation. It also changed the ecological equilibrium of rivers and endangered aquatic and riparian biodiversity.

In the Punjab, illegal sand mining of rivers has caused erosion of river banks resulting in increased flooding. Along the Shimsha River, Karnataka it is destroying the sanctuary for Spot-billed Pelicans and Painted Storks that depend on fish from the river. Sand is being gouged out at a pace a hundred times greater than the replenishment rate from the Cauvery River to supply sand to the cities of Bangalore and Mysore.

### Impacts of illegal sand mining on Indian rivers

Information technology (remote sensing and GIS) noted that an increase in sand mining in rivers changed the structure of rivers. For example it contributed to:

• accelerated erosion of river banks

- wider river channels
- changes to water flows velocity
- deeper rivers and estuaries this changed water temperature and species
- decline in quantity of sand transported and deposited on beaches
- increased upstream erosion as a result of changes in channel slope and flow velocity
- increased downstream deposition and changes in channel bed and habitats
- decline in productivity of fisheries
- decrease in biodiversity
- deterioration of recreational potential
- reduced aesthetic values
- degraded surrounding land

Habitat quality is strongly connected to the stability of rivers beds and banks. Unstable stream channels are inhospitable to most aquatic species.

#### Sinking rivers in India – Periyar and Pampa Rivers in the state of Kerala



### Changes to the structure of Indian rivers

Diagram of sand-and-gravel stream bed showing (A) the nick point that develops with a pit excavation, and (B) the upstream head cutting and downstream bed degradation that develop during high flows.



Diagram source: http://threeissues.sdsu.edu/three\_issues\_sandminingfacts01.html

### Impacts of illegal sand mining on the riparian (streamside) zone

- loss of fertile streamside land-millions of hectares of fertile streamside (riparian) land is lost annually
- decline in valuable timber
- decrease in wildlife habitats



#### Changes to riparian zones

Diagram of channel cross sections showing (A) a typical sandgravel bar in relation to the lowflow channel, riparian zone and water table, and (B) the wide shallow channel that results from unrestricted mining and that is characterised by bank erosion, braided flow, sedimentation, and increased water temperatures.

Diagram source: http://threeissues.sdsu.edu/ three\_issues\_sandminingfacts01.html

### Illegal sand mining on rivers in 12 Indian States, their different laws and regulations

Note some rivers run through a number of states. This makes law enforcement difficult as states have different laws on sand mining. Should there be a national law? Would this solve the problem?

**1. GUJARAT:** Rivers Ambika, Purna, Kaveri, Tapi and Khapra are severely affected by illegal sand mining. It is forming cavities in the riverbed and accelerating water salinity. This is resulting in diminishing agricultural produce.

**2. MAHARASHTRA:** Sand mining needs environmental clearance. The creeks at Thane, Navi Mumbai, Raigad and Ratnagiri are most affected by mining

**3. KARNATAKA** Uniform Sand Mining Policy does not allow mining in Coastal Regulation Zones and prohibits use of machinery. The rivers affected are Cauvery, Lakshmanateerta, Harangi, Hemavathi, Nethravatai and Papaganii

**4. KERALA** Kerala Protection of River Banks and Regulation of Removal of Sand Act, 2001, permits mining in areas managed by a committee. The rivers affected are Bharatapuzha, Kuttiyadi, Achankovil, Pampa, Manimala, Periyar, Bhavani, Siruvani, Thuthapuzha, Chitturpuzha

**5. TAMIL NADU** Policy ensures quarrying in government poramboke land and private patta land can only be undertaken by the government. The rivers affected are Cauvery, Vaigai, Palar, Cheyyar, Araniyar, Kosathalaiyar, Bhavani, Vellar, Vaigai, Thamiraparani and Kollidam

**6. ANDHRA PRADESH** Policy allows only manual labour and bullocks for mining. Rivers affected are Godavari, Tungabhadra, Vamsadhara, Nagavali, Bahuda and Mahendratanaya

**7. ODISHA** Despite public agitation, sand is mined extensively. Districts like Jaipur are constantly in the grip of sand miners and contractors.

**8. WEST BENGAL**: Ruled by the mafia, stone quarrying in Birbhum's Mohammad Bazaar is widespread

**9. BIHAR**: Illegal mining rampant in Bhagalpur, Banka, Munger, Jamui, Lakhisarai, Sheikhpura, Patna, Bhojpur,



Map: http://cdn.downtoearth.org.in/dte/userfiles/images/25\_20120430.jpg

Saran, Rohtas, Bhabhua, Aurangabad, Buxar, Gaya, Nalanda, Navada, Siwan, Jehanabad, Gopalganj, Muzaffarpur, Vaishali, Bettiah, Supaul, Motihari, Madhubani, Kishanganj, Saharsa and Madhepura

**10. UTTARAKHAND**: Illegal sand mining along Ganga near Haridwar is a worry for inhabitants of Matri Sadan ashram.

**11. NAGALAND**: Sand mining along the Dansari River in Dimapur. Dansari is largest river in the state and has highest concentration of sand

**12. MADHYA PRADESH**: State exempts sand mining from environmental clearance. Mining areas are not demarcated. Therefore, mining far exceeds the allotted area. A strong nexus between contractors, politicians and bureaucrats facilitates illegal mining. It is rampant in the rivers Chambal, Narmada, Betwa and Ke



### Yamuna River, near Delhi

Illegal sand mining has changed course of the Yamuna River.

#### NARROW STRIP

Illegal sand mining left a strip of land 200m wide between the pit and Yamuna River YAMUNA RIVER

Excessive sand mining on the Yamuna river bed has changed the course of the river at many points



This 0.5km long, 2m deep and 7m wide, trench is dug along the Yamuna River. Formed because of excessive excavation of sand from the river bed

Image source: http://i.dailymail. co.uk/i/pix/2013/08/07/article-2386267-1B3170F7000005DC-700\_964x706.jpg Change in course of Yamuna River from 2009–2013

Yamuna River moved almost 500m to the east on the floodplains that could lead to massive flooding. At Gharbara village, sand mining left a 500m long, 50m deep pit Irrigation department proposes to set up stone studs and stone dampeners along Yamuna to check shifting of river Diagram source: https:// gurumavin.com/ ngt-stops-illegalsand-mining-onyamuna/

PROPOSED STONE STUDS & 6 STONE DAMPNERS 50MC/C

HOW THE RIVER HAS SWALLOWED BANKS

2009

2011

2012

**OVER TIME** 

### **Kerala rivers**

Endowed with 44 rivers, Kerala has experienced illegal mining well above permissible limits. It has eroded river beds and banks that led to the loss of precious agricultural land.

The Neyyar River has adopted a new course due to excessive mining. As a consequence river channels dried up and deep pits formed causing landslides along the river. Homes on the river bank collapsed and heavy traffic of sand trucks contaminated the river with oil leaks. As the villagers are intimidated by the sand mafia they surrender their land to these thugs.

Sand mining has now been banned in Neyyar, Vamanapuram, Kallada, Kuttiyadi, Kabani and Chandragiri rivers. However, illegal excavation is still rampant with more than 1,700 illegal quarries operating in the region.

By 2020, Kerala is anticipated to consume 60 million tonnes of sand annually. This is a massive incentive for illegal mining to keep digging while it wipes out vital ecosystems

### WELL-OILED NEXUS

Labourers from the Northeast are brought in to extract sand from riverbeds

The mafia digs and transports sand at night

Demand for sand expected to hit

MN TONNES a year in Kerala by 2020 Of the state's 44 rivers, eight are almost dead, 32 affected because of sand excavation

> Sixty cases registered in six months, but police were allegedly paid off

Many officials own trucks, boats that ferry sand. Top department representatives lobby for assignments in regions where mining is rampant

Diagram: http://www.hindustantimes.com/Images/ popup/2015/4/24\_04\_15-metro11.gif

### Changing Indian landscapes – photo story

'In Kerala, rampant river sand mining is killing the perennial rivers; in Karnataka, the groundwater level has fallen steeply in many areas; in Andhra Pradesh and Telangana, a good law meant to regulate sand mining is gathering dust.'

Source: http://www.frontline.in/the-nation/changing-landscapes/article7438099.ece



Sand being mined from the Periyar near Vazhakkulam in Ernakulam district. Photo: The Hindu Archives



The Yaladabagi bridge in Sira taluk in Tumkur district which gave way because of sand mining. Photo: By Special Arrangement



Mookkunnimala Hill near Thiruvananthapuram. The hill, once known for its rich forests and biodiversity, is stripped bare. Its sides are littered with quarries, crusher units and deep pits. Photo: S. Gopakumar



The riverbed of a tributary of the Netravathi has been converted into a makeshift road that sand trucks use to reach the main road, in Bantwal. Photo: H. S. Manjunath



On the Tungabhadra riverbed at Panchalingala village in Kurnool district, Andhra Pradesh, sand is collected in tractor trailers fitted with sieves. In the background is National Highway 7. Photo: U. Subramanyan

國際 法公司法律公司 法公司法律 人名法国人 化超过分 超大学超过的



Near Pullur in Telangana, a tractor trailer loaded with sand on the Tungabhadra riverbed. Photo: U. Subramanyan

### Money versus impacts of illegal sand mining of rivers on groundwater and water quality

### Illegal sand mining of rivers impacts on groundwater.

Excessive illegal sand mining of rivers effects adjoining groundwater e.g. depletion of groundwater in villages on the banks of rivers in Andhra Pradesh and Karnataka.

Illegal sand mining of rivers impacts on water quality:

- Illegal sand mining near the sea, causes saline water to enter groundwater and rivers
- Oil and chemicals discharged by excavation machinery, barges and transportation vehicles
- Release of toxic chemicals from dredging soil from bottom sediments bio accumulates in aquatic food webs

### Technology finds sand mafia: drones, GIS, Google Earth

In India, sand deposition in rivers has been the biggest source of sand for the construction industry. Using remote sensing, GIS, Google Earth and drones, data monitors sand mining areas of Papagni and Pennar Rivers in Andhra Pradesh and Karnataka. Unregulated and excessive sand mining in river beds led to falling groundwater levels and deterioration in its quality.

#### Aerial monitoring of Illegal sand mining by drones



Source: http://www.ejolt.org/wordpress/wp-content/uploads/2014/08/ money.jpg

Stringent monitoring of the illegal movement of sand from source to destination using information technology tools will generate real-time data on mined out sand.

### Drones film illegal sand mining and expose sand mafia in Maharashtra

Unmanned aerial vehicles (UAVs) deployed in Nagpur to monitor violation of sand mining leases and illegal extraction. Government plans to replicate the model across Maharashtra.





Sand mafia at work on an Indian beach Source: http://www.911metallurgist.com/blog/wp-content/uploads/2013/08/M\_ld\_407973\_sand\_mafia.jpg

### Illegal sand mining of India's beaches

### Maharashtra's beaches – Mumbai, Kihim and Awas

Mumbai is an ever expanding asphalt jungle. The megacity originally consisting of seven islands, has experienced surges of reclamations, requiring legal and illegal sand. However, the plan for Mumbai's first artificial beach has faced a brick wall due to a huge shortage of sand. This was supposed to be the first reclamation undertaken to create open spaces rather than real estate projects.

Illegal and extensive sand mining between Kihim and Awas beach, north of Alibaug, led to drastic changes in topography, with a 70% decline in sand on these beaches. Mechanical dredging led to soil erosion, uprooting of trees and a drop of three metres in the level of the beach. Activists against sand mining in the area have been beaten by the Alibaug sand mafia

#### **Newspaper article**



Source: https://pbs.twimg.com/media/CizL-u-VEAEfLD1.jpg

#### Kerala's beaches

Andhakaranazhi beach is one of the major tourist spots in Alappuzha, located in the state of Kerala. About ten years ago, the beach was as wide as a football field. Now little is left, and salty sea water is mixing with fresh water in the river. Despite illegal sand mining being banned by the Green Tribunal and punishable under the law, it is rampant.

'Boats reach Andhakaranazhi by five in the morning and starting loading sand, continuing even in broad day light. If authorities continue to play dumb and wink at this illegal mining, the time is not far off when Andhakaranazhi beach will soon become history.'

http://www.mathrubhumi.com/tv/ReadMore/2582/manal-kadathu/E

### Illegal and extensive coastal sand mining impacts adversely on environment

Despite the ban, illicit coastal sand mining continues on a massive scale and over time has caused the following changes to the environment:

- erosion of foredunes that protect adjoining land from destructive waves during storms and coastal flooding
- destruction of picturesque beaches causing a decline in tourism (aesthetic value)
- loss of recreational potential (swimming)
- affects habitats e.g. sea turtle depend on beaches for nesting and near extinction of gharials (species of crocodiles) in India
- turbidity of coastal waters causing death of corals that require sunlight
- destroys fisheries causing problems for people relying on fishing for their livelihoods
- threatens biodiversity and is a natural defence against climate change (sea level rises)

#### Direct and indirect impacts of coastal and ocean sand mining



### India's laws and regulations

Under Indian law sand is considered a 'minor mineral' unlike coal, diamonds and gold that are classed as major minerals. The extraction of minor minerals is governed by laws in each state rather than federal laws, and as a result the laws vary across Indian states. Unfortunately, most sand mining occurs without a license because regulatory consequences are minimal, however, changes are ahead:

- National Green Tribunal (NGT) placed restraints on all sand mining activities without environmental clearance.
- Illegal sand mining is prohibited along coastal areas, which fall under the Coastal Regulation Zone (CRZ).
   Punishment for sand mining without permission is imprisonment up to two years and fine up to Rs 30,000.
- States and local authorities have been advised to use Android applications, GPS and bar-coding systems to track vehicles of illegal miners and those exploiting sand beyond permissible limits.

Although laws regulate sand mining in most states, rivers and beaches are still dredged beyond safe levels. Illegal quarrying continues along the rivers of Uttar Pradesh, especially in districts such as Guntur, Krishna, Srikakulam and East Godavari, where 2,000 trucks of sand are transported to Hyderabad every day.

### Strategies to reduce negative impacts of illegal sand mining

Illegal sand mining is not only killing our rivers but also has immense repercussions on our beaches, as it is sand carried by rivers that replenishes coasts. There is an Diagram: https://na.unep.net/geas/articleimages/Mar-14-figure-3-lrg.png

urgent need to find a viable replacement for sand in a world focussing on the construction industry.

What can be done:

- Campaigns, protests
- Enforce existing laws and regulations
- Stricter laws, punishments, imprisonment
- Fight corruption
- Sand mining licence spot checks
- ISRO satellite images
- Independent police force fighting sand mafias
- Hot line call centre
- Armed forces, court involvement
- Framework for responsible sand mining
- Establish alternatives to sand-straw, hemp, bamboo
- Recycle glass, concrete
- Develop compensation fund-fair displacement of people affected by illegal sand mining
- Strict prosecution for water pollution
- Tax on sand extraction to create incentives to use alternatives
- Authorise mining activities only after scientific assessment shows limited impact on the environment followed by ecological restoration
- Worldwide campaigns



**Protest poster** 

Source: https://d1u4oo4rb13yy8.cloudfront.net/e3da54fe-0b30-404a-8de0-d7692630d574.jpg

### **Activities**

Illegal sand mining is a rampant problem in the riverbed of the Ganges River and along its banks. Sand miners shovel large chunks from both banks and pump it up from the riverbed.

- What are the connections between sand and the construction industry in India?
- What is meant by the 'sand mafia'? Who are their supporters?
- Describe the illegal sand mining process?
- Why would a builder buy illegally sourced sand in preference to legally sourced sand?
- What are the laws and regulations prohibiting illegal sand mining?
- Despite laws why does the indiscriminate plundering of illegal sand mining go unabated and unchecked?
- Refer to the map of India showing illegal sand mining activities along Indian rivers
  - What are the problems of sand mining laws in Madhya Pradesh?
  - Explain the situation of illegal sand mining of rivers in the states of Gujarat, Andhra Pradesh and Bihar.
- Discuss changes to rivers and riparian areas from illegal and extensive sand mining.
- Describe the impacts of illegal and extensive sand mining on groundwater and water quality.

- How does illegal and extensive sand mining impact on Indian beaches?
- Explain why illegal sand mining is unethical?
- How can technology such as satellite imagery improve the management of this environmental problem?
- List alternatives to using sand in the construction industry.
- Sand has turned into a goldmine, as there is too much money involved in illegal mining and little motivation to stop it. Explain this statement.
- Rivers are common property and have benefits to different stakeholders. Explain this statement.
- Discuss why sand mining is not sustainable in India.
- Suggest strategies to reduce the impacts on illegal and extensive sand mining in India, on people, places and environments



http://coastalcare.org/2013/05/sand-wars-an-investigation-documentaryby-denis-delestrac/

"Sand is the second most consumed natural resource, after water. The construction-building industry is by far the largest consumer of this finite resource. The traditional building of one average-sized house requires 200 tons of sand; a hospital requires 3,000 tons of sand; each kilometre of highway built requires 30,000 tons of sand... A nuclear plant, a staggering 12 million tons of sand..." Captions and Photograph by "Sand Wars" Award-Winning Filmmaker: © Denis Delestrac (2013).

\_Source: http://coastalcare.org/2016/10/illegal-sand-mining-the-open-secretof-a-multi-million-crore-scam-india/

### **ICT Resources**

- Sand mafia articles from The Times of India http://timesofindia.indiatimes.com/topic/Sand-mafia
- Mapping of River Sand Mining Zones Using Remote Sensing and GIS: A Case Study of Papagni and Pennar River Beds, Andhra Pradesh – http://www.academia. edu/27148863/mapping\_of\_river\_sand\_mining\_ zones\_using\_rem ote\_sensing\_and\_gis\_a\_case\_ study\_in\_parts\_of\_papagni\_and\_pennar\_river\_ beds\_ysr\_district\_andhra\_pradesh
- ISRO satellite images to check 'illegal sand mining' – http://www.thehindubusinessline.com/news/ science/isro-satellite-images-to-help- check-illegal-sand-mining/article7045779.ece

- Tragedy of The Commons: Corrosive Growth of the Illegal Sand Mining Mafia, The Citizen (01-04-2016)
   http://coastalcare.org/2016/10/illegal-sand-miningthe-open- secret-of-a-multi-million-crore-scam-india/
- Sand, Rarer Than One Thinks: A UNEP report (GEA-March 2014) – http://coastalcare.org/2016/10/illegalsand-mining-the-open-secret-of-a-multi-millioncrore-scam-india/

### Video/YouTube

- The story of sand in the Cauvery http://www. conservationindia.org/videos/unearthed- the-storyof-sand-in-the-cauvery
- ABC Foreign Correspondent catches illegal sand miners at work under cover of darkness – http://www.abc.net.au/news/2017-03-28/the-greatsand-heist-fuelling-india-120-billion-building/8390984
- Illegal sand mining https://www.wired. com/2015/04/adam-ferguson-illegal-sand- mining/
- Coastal Care-Illegal sandmining in India http://coastalcare.org/?s=India+sand+mining
- India's Sand Mafia: The Dark Secrets of India's Booming Construction Industry – https://www. youtube.com/watch?v=ugT-zyXGNIY
- Inside: Exposed The sand mining mafia. Full Episode – https://www.youtube.com/watch?v=Xqgnu4OxBpl



# **NATURAL RESOURCES**

# CHILD LABOUR IN INDIA'S MICA MINES The Global Beauty Industry

### **Geography Syllabus Links**

- Natural Resources: Mica, minerals (Stage 6)
- Human Wellbeing: Child labour (Stage 5)
- Interconnections: Production, consumption, trade impacts (Stage 4)
- Cross- curriculum priorities: Asia, Sustainability

### All that glitters is not gold!

The 'sparkly' mineral called mica is a key component in the billion-dollar beauty industry. It provides the extra 'shiny pop' to lipstick, eyeshadow, nail polish and blush, and other types of beauty products. Additionally, this highly sought after silver coloured mineral is utilised as snowflakes in Christmas decorations, and valued in industries such as construction, automotive, medical (X-ray machines and atomic microscopes) and defence (missiles, lasers and radar). In the modern, technological world, mica is virtually used everywhere!

Enabling us to enjoy these luxury items, poor Indian children as young as five years old work in dangerous illegal mica mines that are either abandoned 'ghost' mines or unregulated collapsing mines. These children suffer head injuries, respiratory infections like silicosis, and even death. These children have no idea why adults are so obsessed with this shiny mineral. Now you know why!

The ultra-rich cosmetics industry aims to maximise profits by sourcing mica using low cost labour. Desperate, unemployed Indians and child labourers excavate mica from the ground. The mica sheets are then crushed into a fine powder that refracts (bends) light to create the shimmering effect in makeup. Aware of the problem, beauty industry companies such as Lush and L'Oréal aim to clean up their glittery supply chain.

Now go through your makeup bag for anything that glistens, sparkles or glitters, and chances are it contains mica. So, next time you look in the mirror, think about the ethics of the makeup on your face

### Educational consultant Author, Macmillan Australia



Image source: http://sonailicious.com/wp-content/uploads/2014/03/red-lips.jpg

### Links between mica rock, mica flakes and shiny makeup



Image source: http://www.cosmeticsdesign-europe.com/Formulation-Science/Mica-and-child-labour-in-focus-due-to-Lush-s-latest-stand

### Global connections: production and exports

China is the top global producer of mica but according to the British Geological Survey the Koderma district in India's Jharkhand Province contains the world's largest mica deposits.

In 2016 India officially produced 19,000 tonnes of mica but exported 140,000 tonnes. This imbalance is a clear indication of the magnitude of illegal mica mining occurring in India. About 62% of India's mica is exported to China where some is channelled to European and US cosmetic giants.

#### Main mica mining countries (1,000 tons)

	MICA PRODUCTION		
COUNTRY	US GEOLOGICAL SURVEY, 2015	BRITISH GEOLOGICAL SURVEY, 2014	UN COMTRADE, 2014
China	780	159	159
India	20	1	138
United States of America	42	50	ā
Canada	22	16	21
South Africa	Ö	D	13
Madagascar	10	12	12 (17 in 2015)
France	20	20	13
Finland	54	12	8
South Korea	30	24	0
Russia	101	9	0
Brazil	12	10	4
Other countries	32	30	44
World total	1,123	343	421

Table: https://www.somo.nl/wp-content/uploads/2016/05/Beauty-and-a-Beast.pdf

### India: Mica production changes over time

Mica is a component in igneous and metamorphic rocks. About 4,000 years ago it was first mined in India to be consumed as a medicine. In the late 19th century the British discovered mica in a belt spanning Jharkhand's Koderma, Giridih and Hazaribag districts, and Bihar's Nawada, Jamui, Gaya and Bhagalpur districts

The profitable booming mica industry escalated, with over 700 legal mines employing about 24,000 people. The Koderma district, once called themica capital of India, witnessed the growth of mica tycoons and the construction of palatial dwellings. The mine employees enjoyed steady jobs and their family had access to healthcare.

However changes were ahead:

- 1943 discovery of a mica substitute
- 1980 Forest Act imposed restrictions on mining in forested areas
- 1991 dissolution of the USSR, India's biggest mica importing country

As a result, the Indian mica industry slowly declined, legal mines were forced to shut down, unemployment increased, and poverty in mining villages intensified. Thousands of miners without land and farming knowledge, were forced to migrate to cities or starved

By 2014, the mica industry in India had declined to only 38 legal mica mines. These legal mines were unable to supply the expanding global demand for mica, especially from China's demand for 'natural cosmetics'.

Unfortunately, by this stage mica production had evolved into a black market or called the 'mica mafia'. Impoverished families and their children gained employment working in dangerous illegal pits without protective gear. In response the state established mining and forest officers to crack down on illegal mining. However, by greasing officers' palms with money, the scam continued.

Recently, mica was re-classified as a 'minor' mineral, making it easier for an Indian state to issue a licence to small operations. Plans are underway to regulate Jharkhand's mica industry that could generate revenue, bring jobs to the area, promote development of local villages and help curb child labour.

Nonetheless the main hurdles in the mica industry today are:

- 70% of production is from illegal mines in protected forested areas and abandoned mines.
- Most illegal mines continue to use child labour and exploit adult labour.

### Main mica production areas in India

Around 95% of India's mica is distributed in three states of Jharkhand, Andhra Pradesh and Rajasthan. The world's largest deposit of mica is in the Koderma district in Jharkhand.

India's mica belt runs through the dense forests of northern Jharkhand and southern Bihar. The belt loops across seven districts-Jharkhand's Koderma, Giridih and Hazaribag and Bihar's Nawada, Jamui, Gaya and Bhagalpur. The entire landscape glitters in the sunlight. Imagine a giant brush coating the baked earth with rouge -- the shimmer is uncannily similar because top cosmetics brands use mica powder, sourced from this region, to give lipstick and eye shadow their sparkle.

Adapted http://timesofindia.indiatimes.com/india/The-lost- childhood-of-Indias-mica-minors/articleshow/51871390.cms

In NE India in Jharkhand/Bihar most of the mica is collected informally from the top soil using simple hand tools. Because of the remote location and lack of resources in the area, the population rely on mica to maintain their livelihood.

#### Main mica producing areas in India



Map http://news.trust.org/application/assets/shorthand/mica/media/mica\_ investigation\_map1-mr.jpg

### Mica supply chain in Koderma district

The mica supply chain is complex and globalised, changing hands many times from miner to consumer.

Once the mica is collected and weighed, it is bought by traders and transported to Domchanch, a small town in the Koderma district. It is sold to middlemen, before being cut, refined and sorted at Domchanch.

Industry insiders value India's export trade- both legal and illegal at about Rupees 125 crore. (\*1 crore is ten million (10,000,000)

#### Map locating Koderma, Domchanch and Dhab



### 1. Andhra Pradesh

- Area 97km long and 24–30 km wide.
- Found in Nellore district

#### 2. Rajasthan

- Area 322 km long and 96 km wide
- Extends from Jaipur to Udaipur.
- Main producing districts are Bhilwara, Jaipur, Tonk, Sikar, Dungarpur and Ajmer

#### 3. Jharkhand

- Area 150km long and 32km wide
- Spreads from Gaya district in Bihar to Hazaribagh and Koderma districts in Jharkhand.

#### 4. Other Producers

- 11% mica production in India.
- Main states are Maharashtra, Karnataka, Kerala, Tamil Nadu, Orissa, Madhya Pradesh, West Bengal, Haryana and Himachal Pradesh

### Workers wait to weigh their bags of mica. From here it is sent to Kolkata for export



Image source: http://www.wired.co.uk/article/mica-illegal-mining-india

### Mica supply chain

The mica is sold to traders, processors and exporters with deals conducted on mobile phones, leaving no paper trail as it leaves India for manufacturers overseas

- 1. MINERS
- 2. COLLECTORS
- 3. TRADERS
- 4. PROCESSORS
- 5. EXPORTERS
- 6. SECONDARY PRODUCER FINISHED GOODS
- 7. RETAILER MARKETER
- 8. CONSUMER

### Domchanch

Domchanch's main road is lined with mica workshops. Here skilled Indians cut and cleave the transparent mica sheets with knives and scissors. They then sort the mica into different qualities. The lowest quality mica remains in India and the best quality is exported to USA, where it is then sold to China. Everything is used and nothing is wasted.

### Worker processing mica sheets in Domchanch to be exported to China



Source: http://matildegattoni.photoshelter.com/image/I0000gQVIgUCwyYk

### Dozens of mica processing shops are lined up along the main road of Domchanch



Source: http://matildegattoni.photoshelter.com/image/I0000R\_0j5QCboYs

### Financially viable to mine in India

The mica industry is not financially viable for most countries, as it requires expensive manual labour. However in India where miners earn a pittance for extremely dangerous work, and child labour and bonded labourers (work to repay loans taken out by their fathers) are employed, it is a financial winner for industries dependent on mica as a major component in the production process.

Landless and illiterate mica miners are at the mercy of unscrupulous agents, middlemen and exporters.

Here lurks the hidden secret of human rights abuses and environmental degradation, as some Indians work to merely survive, while others exploit resources and miners for wealth.

Cheap labour creates large profits:

- Child earns 8 cents for 1kg (collects around 10kg a day for 80 cents).
- World market ranges from \$1,000 \$2,000 for 1kg. Top quality sheet mica used in electrical components sells for \$2,000 per 1kg

### Woman collecting mica chips



Image source: https://www.somo.nl/wp-content/uploads/2016/05/Beautyand-a-Beast.pdf

### **Exploited women miners**

Women who work in the mica industry in India are poor. They lack training, an education, legal status, and have no control over land or the mineral resources contained therein.

Women are at the bottom of the hierarchy of mica production. Bondage, a contemporary form of slavery, is a widely used method of employment.

### Employment profile of women working in mica mines in India

- Experience physical exploitation
- Casual workers, in low technology, labour intensive processes
- Work long hours
- Lack social protection
- Subject to occupational health hazards

#### **Children mica mining**



Image source: https://s-media-cache-ak0.pinimg.com/564x/49/d5/f9/49d5f9 3a55122ef60506ab7c2750f4f8.jpg

### 'Blood' mica-not a pretty picture

### India's shameful child labour mica mining for the beauty industry sparkle!

Child labour persists despite the Indian law forbidding children under 18 years working in mines and is also against United Nations Child Conventions. However families living in extreme poverty rely on children to boost their household income.

United Nations Child Conventions states it is illegal for children under 14 years to work with mica extraction or in mining in general.

According to the International Labour Organisation (ILO), mining is one of the worst forms of child labour.

DanWatch, a non-government organisation, stated that 12 out of 16 international cosmetic companies knowingly or unknowingly used child labour in the production of their products



Image source: https://www.theguardian.com/sustainable-business/2016/ jul/28/cosmetics-companies-mica-child-labour-beauty-industry- india-

About 500 Indian villages depend on the mica trade for their livelihood and survival. However, India's mica 'ghost' mines are death traps. In June 2016, *Save the Childhood Movement* documented over 20 micarelated child deaths in India. Although there are no official figures on child deaths in mica mines as it is illegal, villagers advocate an average of ten fatalities a month. The statistics are even higher for adult fatalities.

Unfortunately, victims' families and mine operators, do not report deaths. Instead they choose to accept payment for the loss of a child rather than risk ending illegal mining that brings income to some of India's poorest people.

Abuse, violence and intimidation taint the industry. Activists state it is a double crime as it is both illegal and they engage child labour.

### Jharkhand and Bihar mica mining area

The Indian states of Jharkhand and Bihar are responsible for 25% of the world's production of mica. However, there has been a huge decline in legal mines from 1961 (432), 1986 (73) to 2016 (2).

Approximately 37% of the population in Jharkhand and 34% in Bihar live below the poverty line. Oppressive poverty implies that children tend to be more vulnerable into being coerced to work, as families rely on them to supplement the household income. The Dutch campaign group Centre for Research on Multinational Corporations (SOMO) found 20,000 children were involved in mica mining in this area.

The Jharkhand/Bihar area contains of 300 rural villages, such as Dhab (refer to previous map). This poor village with its mud-and-straw dwellings houses 2,000 people. Here, in the deep forest, mica is so abundant that it is found in most gardens. About 10% of children do not attend school as they are forced to work in the mica mines. Aimed to address this problem, the government is administrating more schools for children aged 6-14 years, and Save the Childhood Movement India, declared 100 of the villages as child-friendly villages. Mica traders could be prosecuted as employers under the Child Labour (Prohibition and Regulation) Act, 1986, if caught buying the mineral from a minor. However, attempts to combat child labour is limited, if companies continue to remain silent on governments' inaction on human rights abuses.

Companies using mica from Jharkhand/Bihar region:

- Unilever World's third largest cosmetics and personal care company. Largest cosmetics company in India
- Ahold One of big three cosmetic retailers in Netherlands (Etos). Sells mica in products to wellknown cosmetic brands

#### Main mica mining area in Jharkhand/Bihar (in red) 75km by 20km.



Map: https://www.somo.nl/wp-content/uploads/2016/05/Beauty-and-a-Beast.pdf

### **Working conditions**

As soon as children are able to walk in Jharkhand, India, they are often forced to work in mica mines to supply the world with sparkling products.

'As the sun crawls up the sky in Koderma, abandoned mica mines start shimmering in its reflection. Driven by hunger pangs, a group of sleepy children from a neighbouring village trudges towards the Charki mines, holding mining tools in their hands.'

'Five-year-old Ajay Das hurriedly slips into a narrow hole and starts his day. His tiny hands can barely balance the hammer, but he still hits the shimmering wall accurately and breaks the flakes off it. The mineral that falls off in flakes is called mica, which is used to add glitter in natural cosmetics.

Ajay works six days a week.'.... 'After toiling for 7–8 hours a day, Ajay manages to earn a paltry sum of 20 Rupees.' (40 Australian cents)

Source: http://www.pointblank7.in/?p=3220

#### This is not a sandbox – children are collecting mica



Source poster: https://s-media-cache-ak0.pinimg.com/originals/9e/9f/c0/9e9 fc087710994c3f907a62992f37469.png

Suddenly, shining under the baking sun, dozens of piles of a glittery, flaky minerals appear at the side of the road. The source of these stacks lies a little further inside the forest. Hidden in the woods, small groups of miners are busy working in what look lik giant rat-holes, pounding at cave walls with rudimentary tools and sorting the debris with their bare hands. Their wicker baskets are full of a translucent sheet mineral called mica.

At the end of today, the few dollars they have earned will just be enough to provide for their families. The material mined will end up in products found in every western home.

Source: http://www.wired.co.uk/article/mica-illegal-mining-india

In Bhilwara district in Rajasthan, boys as young as five year old climb down narrow, crumbling shafts to cut mica with a hammer and chisel. They work up to eight hours a day. Operated by mining syndicates to cater to the growing globa demand for quality mica at cheap prices, these mines are the backbone of local villages, steeped in grim poverty.

As they work in makeshift underground holes, miners are often exposed to collapses and landslides-which can be fatal. 'Whenever I venture inside those holes, I don't know if I will come back alive,' explains 35-year-old Mantu Turi, who has been mining since he was ten. 'The only thing I know is that if I don't go, my family will not eat.'

Source: http://www.wired.co.uk/article/mica-illegal-mining-india



#### Women collecting and transporting rocks containing mica.

Photo Credit: Manan Ansari via MTV Voices

### What is being done?

### 1. Responsible Mica Sourcing Summit Beauty

The Business for Social Responsibility (BSR) and the Natural Resources Stewardship Circle (NRSC) hosted a Responsible Mica Sourcing Summit in Delhi. The goal was to present to 63 stakeholders the social and economic risks of the mica supply chain. Stakeholders included: brands such as Estee Lauder, Chanel, Yves Rocher, Clarins and L'Oreal; and representatives from Jharkhand/Bihar child labour commissions.

An agreement was reached focusing on '*traceability and transparency, community empowerment and multi-stakeholder governance*'.



### 2. Child friendly villages

Bal Mitra Gram (BMG) or 'child friendly' village was adopted by Indian NGO Bachpan Bachao Andolan (BBA) in 2001. The villages are classified as 'friendly' for children measured by three factors –health, education and safety. The majority of children in the child friendly village have been deprived of their childhood. Most of them were engaged in economic activities such as mica mining, and as a consequence denied an education.

- BMG village ensures no child labour and all children are enrolled in schools.
- BBA has successfully established 105 BMG. However, this leaves about 400 villages or 60,000 children still at risk.

Fortunately, there emerges a light at the end of the tunnel as BBA's model of empowering villages through education appears successful. For example, in Jharkhand. Giridih's Tisri Block education officer claims over 90% of 35,000 children in BBA villages remain in school.



### Child labourer

Source: https://www. graceandable.com. au/wp-content/ uploads/2016/10/ mica-indian-childlabour-data-1.jpg

### By the numbers



Image source: http://www.indpaedia.com/ind/images/8/84/Mica\_belt\_and\_ industry\_size%2C\_Bihar.jpg

### Child Friendly Village – Girls able to attend school with the aid of donated bicycles.

In the mica mining areas of India access to education particularly for girls is very low for many reasons; no schools, schools too far away, no bathroom facilities for girls; little understanding amongst adults on the need for education for girls as opposed to boys. In the mica mining areas the % age of girls/women who are literate falls to as low as 20%. In most villages no girl has ever gone to middle school, let alone high school.

A major challenge for girls to get access to school is the travel, often through the jungle, avoiding, bears, leopards and snakes, these paths may be as long as 10 km. For boys this does not seem to be such a challenge and they can often stay overnight in the school, for girls this travel is a major challenge and the girls also cannot stay overnight as this is seen to be culturally incorrect, also this travel can expose the girls to child traffickers who may steal them. This is an area of child marriages, from the age of 10, often much older men, sometimes these men are fronts for child prostitution, and they may provide a small dowry and gain rights to the girls. In many cases the families have no choice as they are in debt to the local traders/money lenders and are forced to sell their children, especially girls. However, a donation of bicycles has enabled more girls to attend schools in Child Friendly Villages.

Source: http://www.bba.org.in/?q=content/mica-bike-clubs-help-provideaccess-education-mica-mining-areas-india

### 3. L'Oréal

L'Oréal owns brands such as Body Shop and Maybelline. The company as a signatory to the United Nations Global Compact, is committed to respecting and promoting human rights along its mica supply chain. However the supply chain is not always traceable and transparent and child labour, low wages and unsafe working conditions prevail.

Instead of leaving India, L'Oréal is committed to sourcing mica only from legal and fenced mines, thereby avoiding

the informal sector where child labour is most prevalent. The company aims to monitor working conditions and ensure human rights are respected. By the end of 2016, 97% of L'Oréal's mica came from secured sources.

### 4. Lush

This British cosmetics company is committed to remove all traces of natural mica from its products, following a *Guardian* article about child labour. However, at present the company has been unable to eradicate the mineral from its complex supply chain.

### Future of India's mica industry

India has experienced a glittering past but faces an uncertain future for the production of the mineral, mica. The country has enjoyed a large percentage of global mica production and its exports, particularly sheet mica. However, the industry may not continue to grow at the anticipate rate as:

- shallow deposits are running out
- villagers lack technology to search for deeper deposits of mica
- young people are faced with the dilemma of leading a hard life in the mines or moving to cities
- governments have imposed strict mining regulations

Fortunately, the mica market earns a dominant share of its revenue from the electronics industry. With the growth in this industry, and rising applications of mica in the robotics industry, the demand for mica is anticipated to grow. Transparency Market Research estimates that the global mica market will expand at 2.6% between 2016 and 2024. The large and growing populations in India (1.3 billion) and China (1.4 billion) have stimulated the flourishing construction industry, and mica is crucial to its development. These two countries are among the largest producers of mica in the world, and India contains some of the world's largest mica reserves. These economies are crucial for the growth of the global mica market.

#### Made in a free world campaign poster





### What can governments, organisations, groups and individuals do to improve the glitter supply chain in your makeup?

Aidan McQuaide, director of NGO *Anti-Slavery International*, says the answer to child labour will not be found in company boycotts or social projects, however well meaning, but instead in efforts that push recalcitrant governments to act.

- Boycott mica: boycotts are not the best approach as 'livelihoods of many poor people can be threatened'
- Trace mica supply chain: aim to eliminate child labour, bonded labour and violations of human rights
- Effective government action: there is legislation to protect working children but there is little enforcement of the law due to corruption and unregistered children
- Actions by businesses: companies must report on labour conditions in their supply chain and publicly release the information. Accountability allows consumers to choose products that best meets their ethical standards.
- Expand number of child friendly villages to enhance educational opportunities

### Did you know?

- VW suspends ties with some Indian suppliers after exposure of child deaths in mica mines
- About 25% of the world production of mica originates from illegal mines
- Sand is the most mined mineral in the world. UNEP states that sand and gravel account for up to 85% of everything mined globally each year (*The Economist*)
- Desert sand is too smooth and therefore cannot be used for most commercial purposes
- Australia's sand was transported to Dubai's Burj Khalifa tower located in a desert environment



Photograph: Oscar Timmers/Terre des Hommes. Source: https://www. theguardian.com/sustainable-business/2016/jul/28/cosmetics-companiesmica-child-labour-beauty-industry-india-#img-2

### **Activities**

- Explain the two faces of SHINE in the photograph (Above right).
- What is mica?
- Where is mica found in India?
- What is mica's use in everyday life?
- List the advantages and disadvantages of mining mica illegally. Present your findings as a two column table.
- Imagine you were a child working in a mica mine. Describe your life.
- Mica is a key ingredient in cosmetic products and is used not only to add sparkle to products, but to absorb excess oils and give it a consistent texture. Research three cosmetic products that use mica. Investigate if they involve child labour in India.
- Read *The lost childhood of India's mica minors*. Summarise the article as a TV report

   http://timesofindia.indiatimes.com/india/ The-lost-childhood-of-Indias-mica-minors/ articleshow/51871390.cms



Reduced version of Times of India article, link above

### While rich cosmetic companies count their cash, children risk their lives to put the 'sparkle' into cosmetics



Source: http://i.huffpost.com/gen/1763712/images/o-INDIA-CHILD-SLAVESfacebook.jpg

### ICT

- Child labour behind international cosmetic brands

   http://www.corporatejustice.org/Child-labourbehind-international.html?lang=cs
- Children in India risk illness and death to mine an ingredient found in cosmetics – http://assets. inhabitots.com/wp-content/uploads/2014/01/Child-Labor-Behind-Key-Cosmetic-Ingredient-537x402.jpg
- ITV News investigates: India's shameful child labour mining for beauty industry sparkle – http://www.itv. com/news/2017-02-22/itv-news-investigates-indiasshameful-child-labour-mining-for- sparkling-mica/
- Blood Mica: Deaths of child workers in India's mica 'ghost' mines covered up to keep industry alive

   http://www.reuters.com/article/us-india-micachildren-idUSKCN10D2NA
- India cracks down on illegal mica mines after exposure reveals child deaths – http://news.trust.org/ item/20160930143525-xvpxy
- The mica ghost mines of Jharkhand http://www. newindianexpress.com/thesundaystandard/2016/ nov/12/the-mica-ghost-mines-of-jharkhand-1537870. html
- Beauty companies and the struggle to source child labour-free mica – https://www.theguardian. com/sustainable-business/2016/jul/28/cosmeticscompanies-mica-child-labour-beauty-industry-india-?CMP=new\_1194&CMP
- Blood Mica: Key findings of investigation into child deaths in India's illegal mica mines – http://www. reuters.com/article/us-india-mica-children-findingsidUSKCN10D2NG
- Child labour in mica products http://www. terredeshommes.org/wp-content/uploads/2016/05/ Pic-front- report-Child-labour-in-Mica-Mine-India-TDH-NL-e1463654931358.png

# **NATURAL RESOURCES**

# **BANGLADESH LEATHER**

### Dr Susan Bliss Educational consultant Author, Macmillan Australia

### **Geography Syllabus Links**

- Natural Resources : Leather (Stage 6)
- Environmental Change & Management: Water, air and soil pollution (Stage 6)
- Interconnections: Production, consumption, trade
   impacts (Stage 4)
- Cross- curriculum priorities: Asia, Sustainability

Global demand for leather, leather products and leather footwear is worth approximately \$215 billion a year. However, as leather is capable of being replaced by other materials such as synthetics, the industry competes by promoting luxury and quality productsboth aesthetically and functionally.

Every year, the global leather industry slaughters more than one billion animals. Leather products are sourced from the skins or hides of a variety of species such as the cow, pig, goat, sheep, deer, ostrich, kangaroo, crocodile, buffalo, snake, eel and stingray. Approximately 65% of leather is produced by cows, 15% sheep and 11% pigs. Some of the most expensive leather products include Louis Vuitton leather bags and Hermes crocodile bags.

In developing countries such as Bangladesh, the leather industry is a source of exports, employment and economic growth. However, deep below the skins and hides lies hidden dangers such as lax environmental laws causing water, air and soil pollution, violations of human rights and child labour

### **Bangladesh's leather exports**

From the 1970s Bangladesh experienced a steady growth in the leather industry. By 2015 the industry had evolved into the second largest export sector, playing an important role in generating foreign exchange and employment for the poor developing country. About 95% of Bangladesh's leather and leather products are sold overseas, mostly in the form of crushed leather, blue wet leather, finished leather, leather garments and footwear. At least 90% originates from the Hazaribagh area, located in the capital city of Dhaka.

Bangladesh exports leather and leather products to 53 countries such as China, France, USA, Germany, Italy, South Korea, Netherlands and Vietnam. In 2017 Bangladesh aims to export \$1.22 billion of leather and leather goods, focusing on high-quality 'Bengali black' leather demanded by European leather manufacturers.

### Bangladesh footwear and leather goods export trends



Source : http://lfmeab.org/images/report/Prospects\_of\_Bangladesh\_ leather\_industry.pdf



### Unsustainable production – decline in exports

During 2014–2015, publicity surrounding the hazardous polluting tanneries and employment of child labourers, saw a decline in leather exports from Hazaribagh and Bangladesh. The European Union warned it might discontinue sourcing leather from Bangladesh if environmental compliances were not guaranteed.

### **Towards sustainable production**

Even though Bangladesh, exports only 0.5% of the global leather market, it has the potential to expand its market share if it adopts an eco-friendly and socially responsible production system. Quality and clean sustainable production of leather is no longer a choice but an essential requirement for the survival of leather manufacturing in Bangladesh. Optimistically, the leather sector aims to prosper when polluting tanneries relocate from polluted Hazaribagh area to the new, environmentally compliant industrial zone at Savar.

### Overview: leather industry in Bangladesh

Bangladesh's leather industry connects poor villagers to wealthy urbanites and combines traditional practices with modern technologies. It is ideally suited to produce leather goods with its abundance of cheap labour and natural resources (animal skins).

#### Characteristics

Bangladesh's leather industry possesses the following characteristics:

- 110 export oriented factories manufacture leather footwear
- 35,000 leather firms including 110 large firms
- Direct and indirect employment of 850,000 people
- 70% of the workforce are women
- 56% of the leather is sourced from cows, 30% from goats and the remaining from buffalo
- Companies that source leather from Bangladesh include Hugo Boss, Armani, Timberland and Hush Puppies
- Only 15%–18% of total leather supplies is required to meet domestic demands
- 76% of tanneries are export orientated
- Apex Footwear is the largest footwear exporting company
- Exported products include shoes, bags, wallets, belts and finished leather
- China, Vietnam and Brazil are three giant leather exporting countries. These countries are shifting

away from leather production due to high labour costs e.g. labour costs in Bangladesh are 1/5th of China's labour costs and ½ of India's. This advantage opens up massive opportunities to expand Bangladesh's leather exports that is anticipated to become a \$15billion sector within a few years.

### Footwear brands sourcing leather from Bangladesh



Poster: http://lfmeab.org/images/report/CIFA\_REPORT\_2016\_LFMEAB\_ Bangladesh.pdf

#### Challenges

Bangladesh's leather industry faces numerous challenges such as:

- Irregular power supply
- Requires modernisation of the leather production
   process
- Inadequate R&D facilities
- High interest rates and limited access to finance
- Vulnerability of small enterprises
- Political instability

### Hazaribagh area, Bangladesh

Leather, a '*farm to fashion*' product, originated in Bangladesh in the 1940s, when the first tannery was established at Narayanganj. By the 1960s tanneries had moved to the Hazaribagh area as it was:

- Located outside the city
- Near the river
- Uninhabited
- Designated as an industrial area

However, over time the number of tanneries grew exponentially and Dhaka's population expanded and spread to Hazaribagh. Today the leather industry is heavily concentrated in the Hazaribagh area possessing 150 tanneries out of the 220 tanneries in Bangladesh. The narrow streets, limited sewage facilities and toxins generated from the leather industry have adversely affected aquatic and human lives. On the other hand, the concentration of small industries offers benefits such as shared knowledge and raw materials, and development of vertical and horizontal integration of businesses.

### **Bangladesh Leather**

#### Stream drainage from Hazaribagh tannery area – different scales of maps



Map: https://www.hrw.org/sites/default/files/media/images/photographs/image001\_118.jpg

### Characteristics of Hazaribagh's tanneries

#### Size

Ranges from small scale cottage operations hiring a dozen workers to large businesses such as the Bengal Leather Complex employing 500 men

#### Workers

Registered workers 25,000

Unregistered workers 30,000

More people are employed following the annual festival of Eid-al-Adha, the Muslim Sacred Festival

#### Push and pull forces

Rice farmers migrated to leather factories 'pushed' by poverty and 'pulled' by prospect of a better quality of

life. Poor unskilled workers are forced to work 14 hours a day, 7 days a week, to merely survive

#### **Union and associations**

Labour union represents 25,000 members who work in tanneries

Bangladesh Finished Leather, Leather Goods and Footwear Exporters' Association represents tannery owners

#### **Production methods**

Many use old, outdated and inefficient processing methods
# Hazaribagh one of world's most polluted places

Hazaribagh means 'a thousand gardens'. However flowers no longer survive as the city is ranked among the ten most polluted places on Earth. The city's smell is a mixture of rotten eggs and meat and acrid ammonia. In the gutters lay animal hairs and skins. Men with poles over their shoulders carry black chemical wastes in open tins through narrow alleys.

#### World's most polluted places



Map: https://risebd.files.wordpress.com/2014/09/polluted-places.jpg

# Leather production process and supply chain

The tanning process consists of three general phases:

• acquisition, slaughter and pre-treatment of raw animal hides.

In registered abattoirs, it is common for workers to bind the animal's legs and slit their throats, while animals are conscious. On the other hand, in illegal establishments cows and goats are slaughtered on the streets at night.

Every year, about two million cows from India are bound, flung onto trucks and transported to Bangladesh to circumvent Indian slaughter bans. When the cows arrive in Bangladesh many are emaciated, malnourished and suffer from infected wounds.

- treatment of hides with a tanning agent
- **drying and shining hides** before sending them to manufacturers

Different processes are carried out at tanning facilities, and some facilities provide other services such as dyeing, bleaching and weaving hides.

Global and national action groups have placed pressure on the leather industry, and as a consequence the supply chain is being redesigned to be shorter for traceability reasons

#### Leather production process

- Animal slaughter
- Removal of raw hide skins from animals. Waste is produced
- Cleaning of hides removal of dung, hair, fats
- Tanning- preservation of hide by treatment with products e.g. chromium salt
- Colour (dyes) and softening and filling agents to produce final articles upholstery, footwear
- Finishing coating (lacquer, wax) to enhance aesthetic properties

# Leather supply chain – production to consumption

- Production process
- Manufacturing
- Distribution
- Marketing and sales
- Consumption local and overseas buyers

#### Photo Story – Hazaribagh leather processes



Child jumps on leather waste used to make poultry feed at Hazaribagh

Source: http://s1.reutersmedia.net/resources/r/?m=02&d=20121009&t=2&i= 661612658&w=&fh=545px&fw=&ll=&pl=&sq=&r=CBRE8981DU E00



Raw hides soaked in lime and sodium sulphide to remove hair and fat. Source: https://undark.org/article/leather-tanning-bangladesh-india/



Steel drums filled with toxic chemicals like chromium, used to tan leather

Source: https://www.wired.com/2017/01/adib-chowdhury-a-thousandpolluted-gardens-inside-bangladeshs-polluted-billion-dollar- leatherindustry/#slide-12



Young child working around deep, open vats of tanning chemicals. The child stirs hides soaking in chemical bath. Source: https://undark.org/article/leather-tanning-bangladesh-india/



Inside Hazaribagh tanneries, child workers exposed to hazardous machinery. Here, a 10-year-old boy named Joey pulls leather from a smoothing machine. Source: https://undark.org/article/leather-tanning-bangladesh-india/



Tanneries in Hazaribagh dump wastewater into ditches that empty into open canals. Here, a worker carries buckets of waste from a tannery.

Source: https://undark.org/article/leather-tanning-bangladesh-india/



Most tannery employees face unhealthy conditions. Here, a worker stands knee-deep in a soaking solution. The hides are then hung overhead to dry. Source: https://undark.org/article/leather-tanning-bangladesh-india



Villagers dry leather from the factories Source: https://www.wired.com/2017/01/adib-chowdhury-a-thousandpolluted-gardens-inside-bangladeshs-polluted-billion-dollar-leatherindustry/#slide-7



Open sores and peeling skin are common among workers who handle tanning chemicals without gloves. Some say their hands become so stiff that they cannot open their fingers unless their skin is wet.

Source: https://undark.org/article/leather-tanning-bangladesh- india

# Dark side of Bangladesh's leather industry

**WATER POLLUTION –** discolouration of water and toxic chemicals.

One tonne of hide leads to:

- a 20m<sup>3</sup> 80 m<sup>3</sup> of wastewater
- b. chromium levels of 100 400mg/L
- c. sulphide levels of 200-800mg/L
- d. high levels of fat
- e. pathogen contamination

Runoff from feedlots creates water pollution Water quantity – large quantities of water consumed in production process **WORKERS AND COMMUNITIES** – any die from cancer caused by exposure to toxic chemicals used to process and dye leather

**SOIL POLLUTION** – flesh, hairs, waste

AIR POLLUTION – ammonia gas, hydro sulphuric gas

**BIODIVERSITY DECLINE** – cancer and deaths throughout food chain

WASTE – 600kg of waste for each ton of wet salted hides

**CHEMICALS** – heavy use of chemicals in tanning process (chromium, formic acid, mercury)

**CHROME TANNING** – high levels of contamination, 90% of leather is chrome tanned. Tanning process strains water treatment plants

Most workers stood barefoot in chemicals on the tannery floor, waded into tanks filled with tanning solutions, and climbed into drums to retrieve the wet blue leather, literally bathing themselves in a soup of caustic and potentially toxic chemicals. Young boys carried water and hides and operated stretching machines, while smaller children tended pieces of leather soaking in open vats.

Source: https://undark.org/article/leather-tanning-bangladesh-india/

Imagine if you worked in a poorly ventilated room, standing in a tub of toxic chemicals for 12 hours a day? These harsh conditions are what thousands of Bangladeshi locals go through every day, to earn small wages that are barely sufficient to feed their families. Yet, the world continues to consume leather products that Bangladeshi tanneries produce.

So, before you think about purchasing a leather jacket, consider the human and environmental costs.

Source: https://www.trustedclothes.com/blog/2016/02/23/24811/



#### Tanning process-chromium

Tanning is the process of treating skins of animals to produce leather. For the past hundred years, chrome tanning has been the dominant method of making leather. Without water treatment plants and sustainable management policies, chromium used in leather tanning changes the hydrosphere, atmosphere, lithosphere and biodiversity.

In Hazaribagh, chromium waste seeped into the soil and contaminated groundwater that provides drinking water to nearby communities. In addition, contaminated water has bio accumulated in aquatic species – a source of food.

In other countries, environmentally concerned tanning industries have converted to vegetable tanning and constructed water treatment plants.

#### Chromium pollution from tanneries



Map: http://www.worstpolluted.org/files/FileUpload/pics/2011/chromium-pollution-tanneriesworld-map.jpg

Compare chrome tanning with vegetable tanning * ch	chrome tanned skins are called wet blue
--	---

	CHROME TANNING	VEGETABLE TANNING				
% of leathers in world	90%	10%				
Ingredients in tanning	Chemicals-acids salts	Natural ingredients-bark				
Time to produce	1 day	20-40 days				
Production method	Mass produced	Hand-skilled craftsmen				
Cost	Cheap	Expensive – high cost process				
Sustainability	Unsustainable, breaks easily Sustainable, durable, strong					

# Chromium tanning produces toxic chicken feed

#### This murky toxic feed chain must be stopped.

Chicken, a staple food in the Bangladeshi diet, is frequently fed tannery scraps. In Hazaribagh, tanneries generate 100 tonnes of tannery scraps a day that are processed into chicken feed, by about 60 legal factories in Gazipur and Dhaka districts. Daily, these factories produce up to 30 tonnes of feed for poultry.

The demand for tannery scraps across Bangladesh is overwhelming, because it is cheap and chickens grow faster on scraps compared to other supplements. Originally tannery scraps were dumped in the Buriganga River but are now sold to factories to produce poultry feed. A report found high levels of chromium in the bones, brains, and muscles of chickens. The Bangladesh Council of Science and Industrial Research (BCSIR) found chromium enters the food chain when tannery scraps are fed to chickens, and then eaten by humans. Research found it led to cancers, liver cirrhosis and kidney damage. As a result of the report, chicken-feed producers ceased using tannery scraps but unregistered and illegal factories continued to thrive on tannery scraps. Poor locals persist in boiling tannery waste to feed household poultry.

# Boiling tanned leather off-cuts in Hazaribagh. First step to manufacture poultry feed.



Photo source: Rashed Shumon http://www.thedailystar.net/chickens-eggsmade-risky-33389

A worker boils animal parts left over during the leather tanning process to be made into poultry feed. Photo by Kamrul Hasan Khan



Source: http://viewsweek.com/south-asia/bangladesh/toxic-poultry-feedthreatens-bangladeshs-poor/

# Bioaccumulation of chromium from tannery scraps to humans

#### **CHROMIUM SALT**

Tannery (wet-blue leather)

- Tanned leather dust
- Poultry feed
- Chicken

#### **HUMAN BODY**

# Tanneries affect water-sources and downstream communities

Globally, the majority of businesses in the tannery industry use environmentally appropriate pollution controls that do not expose local communities to health risks. However, for over half a century the Hazaribagh tannery industry has operated without a waste treatment plant. Wastewater and solid wastes from tanneries, containing sulphuric acid, chromium, lead and animal flesh, find their way into surface water, where toxins are carried downstream. The contaminated water is used by communities for bathing, cooking, swimming and irrigation. The pollutants then enter the Bay of Bengal where prawns are farmed for export.

A study revealed that Hazaribagh tanneries generate 7.7 million litres of liquid toxic waste and more than 88 million tons of solid waste in the form of raw hide scraps, flesh and fat, that are released into the Buriganga River, daily. The river, once the main source of drinking water for Dhaka, is regarded unsafe for human use, especially during the dry season.

# Sources of water pollution in Buriganga River around Dhaka City



Diagram: http://www.mdpi.com/environments/environments-02-00280/ article\_deploy/html/images/environments-02-00280-g001-1024.png

# Working in tanneries impacts on short and long term health

Studies show a causal relationship between tannery pollution and poor community health. There appears to be a higher prevalence of diarrhoea, skin, respiratory and eye problems in Hazaribagh compared to neighbourhoods with similar socio-economic characteristics.

#### **SHORT TERM**

- Sulfuric acid and sodium sulphide burns skin, eyes and respiratory tract
- Discoloration, peeling skin
- Body aches
- Dizziness and nausea

#### LONG TERM

- Cancer higher among children working with chemicals
- Disfiguring and amputated limbs from chemicals
- Chemicals such as formaldehyde and pentachlorophenol are carcinogens-can cause respiratory diseases after years of exposure.
- Death 90% of people who work in tanneries have a life expectancy of 50 years

#### **Child labour and its impacts**

Bangladesh's three main associations involved with leather production declared that '*no child labour is employed in the leather sector*'. Despite this declaration researchers observed children working in the industry. For example:

• National Child Labour Survey found 13,702 children between 5 and 17 years old working in the tanning and manufacturing of footwear and leather goods.

• Human Rights Watch interviewed ten children, some as young as 11, working in tanneries. Many children work 12 or even 14 hours a day, considerably more than the five-hour limit for adolescents in factory work established by Bangladeshi law.'

The majority of working children migrated from the countryside as a consequences of push factors such as family poverty, debt and loss of land. Most children work in small-scale and informal enterprises that generally produce low quality products for the local market. It is rarer to find children employed in large-scale enterprises that focus on exported goods. However, distinctions become blurred, as bigger factories outsource most of their work to smaller factories and home-based workers.

#### Babul is helping his mother in toggling



development/2017/03/22/hazaribagh-makeover-tanneries-residences/

#### Role of children in leather production

- Production of leather e.g. tanning process
- Toggling or drying leather by pagging it to the ground. Children are paid per unit of leather and some work from 5am to 2pm.
- Processing waste material and by-products (meat, bone, scrap leather

- Manufacture of leather items e.g. sewing
- Sale of leather and leather items to local market, shoe shops and shopping centres

#### **Education versus work**

The majority of working children in the leather sector do not receive an education, while others try to combine the difficult task of work with school.

'Sharing a wall with one of the huge Hazaribagh factories are the crumbling rooms of the Taj Mahal Tanneries district high school. A teacher Mohammed Yusuf, says a third of the children in his class of 13–15-year-olds work in the tanning factories. "They do the night shift and then come here. They have all sorts of health problems: they don't understand things and they fall asleep in class." He thinks the government should close the factories but says they won't.

Source: https://www.theguardian.com/global-development/2012/dec/13/ bangladesh-toxic-tanneries-intolerable-human-price

#### **Eid-al-Adha and child labour**

Religious festivals such as Eid-al-Adha generate increased demand for meat and new shoes. This evolves into employment opportunities for children such as working in slaughterhouses, transporting hides and skins, and preparing hides and skins for sale. During this period workers earn less per hide than during the rest of the year, but are able to prepare more hides per day.

During Eid-al-Adha, 1–1.5 million cow hides and 2 million goat hides arrive in Bangladesh to be slaughtered. For 10–15 days, storehouses are crowded with workers, some are young children.

In 2016 at Eid-al-Adha, rain fell in Dhaka causing the streets to turn red when rain was mixed with blood from sacrificial animals



#### Eid-al-Adha 2016

#### Personal story – working in a tannery

Jahaj who is 17 years old, has worked in a leather factory in Hazaribagh since he was 12 years old. He labours ten hours day and earns US\$37 a month. Jahaj processes raw hides into the first stage of leather, known as 'wet blue,' which exposes him to hazardous chemicals. With his bare hands he takes the hides (which are inside a four-metre square tannery pit filled with chemicals) and throws the hides outside the pit. He performs this hazardous task that burns his skin but he continues to work, because he needs money to eat. (Human Rights Watch)



Photograph: https://www.hrw.org/report/2012/10/08/toxic-tanneries/health-repercussions-bangladeshs-hazaribagh-leather.jpg

#### Government's response – relocate to Savar

#### 2009 Relocation to Savar

Amid pressures from activists and overseas buyers, the Bangladesh government in 2009, undertook initiatives to relocate Hazaribagh factories to a new leather industrial zone in Savar. The government allotted 155 plots at the 200 acre leather estate and factory owners were financially compensated for shifting their industrial units to Savar.

Once the leather industry is established at Savar, the adverse environmental impacts from the tannery industry is expected to be minimised with the construction of:

- waste-treatment facilities
- central effluent treatment plant (CETP) for treating liquid waste
- solid waste management system
- chrome recovery unit

The government and owners of tanneries agreed to build a residential area for workers along with schools and hospitals. However, progress to transfer tanneries to Savar was slow, due to both a shortage of funds and workers who protested on the move.



Construction of new tanneries at Leather Industrial Park in Savar

Photograph: http://www.dhakatribune.com/bangladesh/dhaka/2017/04/10/tanners-nightmare-savar/

#### 2017 Relocation to Savar

- By early 2017, 43 out of 155 tanneries had moved to Savar. However the government delayed enforcing the law to appease tannery owners and 30,000 people working in tanneries who staunchly opposed the transfer.
- By 6th April 2017, the Department of Environment (DoE), following a High Court order, demanded closure of tanneries in Hazaribagh. If the order was ignored repercussions would follow, such as: gas and electricity supplies suspended, roads blocked to prevent raw hides entering Hazaribagh, and licenses revoked for those who defied this order.

#### **Relocation problems**

In April 2017, numerous problems arose from the closure of the tannery industry in Hazaribagh, such as:

- Government and tanning owners had not completed their work at Savar. Relocation of leather units, and construction of a residential area for workers, along with schools and hospitals, was yet to be completed
- Completion of Savar was estimated to take about five months
- Factory owners did not inform leather workers whether they would be employed in the new factories in Savar
- Employees were given two options:
  - 1. go to Savar when production starts
  - 2. leave with a few months' wages

About 45,000 workers were concerned about '*how they would survive until they moved?*'

### Workers at Hazaribagh Tannery Mor, protesting on the government move



Source: http://www.thedailystar.net/frontpage/hazaribagh-tanneries-workersface-uncertainty-1389415

#### Flow on effects of tannery closures

- Pushcart labourers About 2,000 pushcart labourers carry raw hide and leather goods in Hazaribagh.
   Pushcart labourers are only hired if there leather production occurs. About 1,200 pushcarts were left abandoned on the streets
- Businesses . Hundreds of grocers and businesses closed due to movement of leather factories to Savar, a grocer, said his sales dropped from Tk5,000 to Tk1,000 a day
- Poverty increased in Hazaribagh
- Polluted and unproductive landscape remains and needs urgent rehabilitation
- Utilities severing of gas, water and power meant workers and their families who lived at the leather factories could not cook meals or wash. April 8 2017, utility services were disconnected to 224 tanneries

#### **Complicated supply chain**

During, November 2016, a Datamyne Report, noted that more than a dozen fashion and shoe companies imported products made in Bangladesh. The largest of these included Michael Kors, Timberland, Hugo Boss, Puma and Gap.

Some companies and manufacturers were certain the leather used to make their products was not imported from Bangladesh. Some brands disputed the report's findings while others were unaware of the source of their leather. In response to the Report most brands reacted by either banning Bangladesh leather or demanding improvements in the leather supply chain.

# Non-government group investigated Bangladesh's leather supply chain



Diagram: https://www.apnews.com/57003bedd3ae4e3e9d1633cf50effc31



'Syed Nasim Manzur, managing director of Apex Footwear and director at Apex Tannery, calls Hazaribagh "an environmental disaster" and said they'll soon close their plant there. But he said the report is a "smear campaign," allegations of child labour are unsubstantiated, and Hazaribagh leather doesn't end up in exported products.'

Source:http://bigstory.ap.org/article/57003bedd3ae4e3e9d1633cf50effc31/ report-examines-grim-bangladesh-leather-trade-links-west'

'As Undark notes, consumers have no way of knowing where the leather in their shoes, purses or belts came from unless companies reveal their supply chains. Undark asked fashion and shoe companies, identified as importers in the Datamyne records, to reveal their supply chain.' Timberland, Hugo Boss, Puma, Clarks, and Gap each told Undark that their companies do not use leather from Hazaribagh in their products manufactured in Bangladesh.

# Towards a sustainable leather industry in Bangladesh

At present production of leather goods in Hazaribagh is unsustainable environmentally and socially. Foreign companies that import leather produced in Hazaribagh should ensure their suppliers are not violating labour, health and safety laws, as well as poisoning the environment. Dozens of leather companies espouse ethical sourcing, and adhere to human rights and sustainable manufacturing processes. However, few disclose information detailing their suppliers.

#### RECOMMENDATIONS

- Ensure sufficient and continuous power supply.
- Start joint ventures with other leather exporting countries like India.
- Import advanced technology.
- Government builds facilities to increase production of finished leather goods.

#### **OPPORTUNITIES**

- Large untapped global market.
- Investment in value added leather products.
- Government policies toward leather exporters cash incentive etc.
- International fashion houses use leather products

#### SUSTAINABILITY

- Trace leather process-sources.
- Construct water treatment plants.
- Improve chemical management.
- Reduce adverse environmental and social impacts.
- Consume ethical leather goods-fair trade, ecofriendly tanner.
- Stop using child and bonded labour.

#### THREATS

- No long term policy regarding branding and promoting. Bangladesh's leather products.
- Political instability, corruption.
- Substandard quality of some products.
- Illegal exports of raw hides/skins
- Potential buyers, stringent compliances such as building treatment plants



#### What is being done? Active Citizenship

Today, consumers are asking whether the leather in their boots or bags was produced by tanneries that pollute environments and exposes workers to hazardous conditions

#### Accountability, Traceability, Ethical Purchasing ACCOUNTABILITY

Corporations and retailers must take responsibility for their actions. Major fashion retailers are aware of violations of human rights and environmental degradation raised by organisations such as Trusted Clothes and other ethical clothing organisations

#### What can you do?

- Assess your wardrobe
- Check label tags on leather goods (shoes, belts, accessories, chairs) for where it is made.
- Check no child labour is part of its production

#### TRACEABILITY

Many supply chains and retailers are working to end child labour, by tracing their manufacturing process.

Next time you buy leather goods, ask: What countries process and manufacture the leather? What are their names and addresses?

#### What can you do?

- Tell friends and family
- Discuss social and environmental problems of the leather industry

#### **ETHICAL PURCHASING**

For companies, retailers and consumers.

Growing number of eco-friendly and sustainable retailers produce leather garments under Fair Trade

#### What can you do?

- Volunteer, campaign
- *Trusted Clothes*, volunteers support inhumane treatment of children in Bangladesh
- Human Rights Watch



What about that 8-yearold child in Bangladesh making a leather purse you used only once to attend a party?

Change starts with you! So, think before you purchase a leather jacket. For decades the tanning industry, has hopscotched across the world, continuously fleeing stringent environmental regulations and rising labour costs. When they vacate their old location they tend to leave long-lasting toxic footprints at each stop.

The Bangladesh Ministry of Industries is working out the future of Hazaribagh and the popular idea is to convert the space into a modern residential area with open spaces, schools and play grounds. Firstly, the soil needs to regenerate in order to remove the toxic elements

#### **Activities**

- 1. Describe the leather processes from animal to shoe as a TV report.
- 2. Leather Hunt: What are you wearing or possess that is made of leather? Select three leather items and devise a list of questions you would ask companies that produced the products you have selected such as:
  - Where is the leather produced?
  - What are the working conditions and wages for workers?
  - Are children employed along the leather supply chain? Share your responses with the class.
- 3. Refer to the images in the article and describe the impacts of leather processing on Hazaribagh's environment and people.
- 4. Mind map the dangers lurking in the leather industry. Divide research into adult workers, children, communities and environment.
- 5. Compare the use of chromium tanning with an alternative tanning processes such as vegetable tanning.
- 6. What lines from this article made the biggest impact on you and why?
- 7. Which photograph made the dominant impression on you and why?
- 8. In groups, explain how visual literacy (maps, photographs, graphs, tables) contributes to a better understanding of the topic.
- 9. The Bangladesh government has been trying regulate, redevelop and relocate tanneries for many years. List the causes for the delay.
- 10. Research the organisation Human Rights Watch, and describe its criticisms of tanneries in Hazaribagh.
- 11. In pairs, investigate connections between Australian retailers and tanneries in Bangladesh. Why is this a difficult task? What did you find?

- 12. Postcard: In groups, select one image and one quote from the internet, required to design a postcard on the impacts of tanneries on the environment in Hazaribagh.
- 13. Imagine you have been hired as an advocate for the workers at the tannery in Hazaribagh. Identify three challenges workers face and how they could be resolved.
- 14. What is the Leather Working Group? What are its aims? How effective is the organisation?
- 15. What is meant by awareness, oversight and ethics in the leather industry? Why is awareness and ethics important?
- 16. Human Rights Watch advocate Richard Pearhouse said 'Consumers should be asking plenty of questions on the shop floor about what retailers are doing to guarantee they are not sourcing leather from Hazaribagh's toxic tanneries.' Explain this statement.
- 17. Perspectives an analysis of a topic requires balanced arguments.

Complete the table below noting the main points supporting and opposing closing tanneries in Hazaribagh.

Factors impacting on tanneries	Reasons to close tanneries	Reasons to keep tanneries open
Economic		
Environmental		
Human/social		

#### 18. Shoe gazing in India

India, one of the world's leather giants, exported \$5.92 billion in leather and leather goods between 2015 and 2016. Roughly 60%-70% of the country's leather and leather goods is produced in the southern Indian state of Tamil Nadu, where many tanneries resemble those located in Hazaribagh today.

Kanpur a small city of 2.5 million inhabitants, is located in the state of Uttar Pradesh in India. The city, home to over 300 tanneries, has self-proclaimed itself as the *'Leather City of World'*, as it is the country's leading leather exporter, with more than 90% of its products exported to Europe and USA.

Kanpur, resides on the banks of the holy Ganges River where an ecological and health crisis has slowly developed. Huge amounts of waste water, laced with toxic and acidic chemicals such as chromium, are channelled from tanneries onto nearby farmland on the outskirts of Kanpur once called the 'King of Roses'. Today, roses have vanished and poisonous vegetables grow. Investigate:

- In groups investigate leather production in Kanpur. Include: leather production process, leather exports, wages, pollution (air, water and soil), environmental laws, water treatment plants, work accidents/deaths, child labour and technology.
- Draw a mind map showing the impacts of the leather industry on workers, surrounding communities and the environment.
- Explain why Kanpur encountered a decline in leather production.



Saida, a tannery worker, in Kanpur. One of many workers and locals who suffer from skin conditions, believed to have been brought about by contact with toxic waste water from local tanneries.

Image by Sean Gallagher. India, 2013 Source: http://pulitzercenter.org/ reporting/india-toxic-price- leather-0



A Reebok export surplus store in Jajmau area of Kanpur. Leather from nearby tanneries is used for making a variety of leather products including shoes, bags and clothes.

Image by Sean Gallagher. India, 2013. Source: http://pulitzercenter.org/ reporting/india-toxic-price-leather-0

#### Sources:

The Wire: Unmaking of Kanpurs leather industry – https://thewire.in/25567/the-unmaking-of-kanpurs-leather-industry/

Hindustani Times: Sow death of Kanpur's leather economy – http://www.hindustantimes.com/indianews/the-slow-death-of-kanpur-s-leather-economy-andup-s-job-crisis/story- s8dCXOdhQW1tp6l27kDNAL.html

Pulitzer Center: India's leather industry – http:// pulitzercenter.org/reporting/india-toxic-price-leather-0

The Indian Leather Industry – https://smallb. sidbi.in/sites/default/files/knowledge\_base/ TheIndianLeatherIndustry.pdf

Indian Mirror – http://www.indianmirror.com/indianindustries/leather.html

Top seven cities in India famous for the leather industry – http://kanigas.com/leather-industry/

Leather industry scheme may create Rs 1 lakh jobs in Tamil Nadu – http://timesofindia.indiatimes.com/city/ chennai/leather-industry- scheme-may-create-rs-1lakh-jobs-in-tamil-nadu/articleshow/56926203.cms

#### 19. Gloversville, New York, USA

The turmoil today in Hazaribagh is reminiscent of the situation in Kolkata, India in the 1990s and of the collapse of the century-old tannery industry in the 1980s in Gloversville, New York.

In the past, the lucrative and polluting leather industry fled Gloversville for foreign shores. Competition from cheaper labour coupled with tougher environmental laws forced the closure of tanneries. The town and surrounding area have spent decades rebuilding the economy and cleaning up pollution left by the factories.

Source: https://undark.org/article/leathers-long-shadow-gloversville-new-york/

#### Investigate:

- Research the rise and fall of leather production in Gloversville that contains the ruins of the Zimmer and Son glove factory in New York. Present as an oral report.
- Could the story of Gloversville occur at Hazaribagh? Explain your answer.
- What happens to communities when the leather industry leaves?

#### Resources

Dark side of Bangladesh's leather trade – http://www. aljazeera.com/programmes/insidestory/2013/12/darkside-bangladesh-leather-trade-201312372825749406.html

Skin Deep: Feeding the Global Lust for Leather-notes and video – https://undark.org/article/leather-tanningbangladesh-india/

Hazardous child labour in the leather sector of Dhaka, Bangladesh – http://www.crin.org/en/docs/Ensing\_ Leather\_Bangladesh\_2009.pdf

Future trends in the world leather and leather products industry and trade – https://leatherpanel.org/sites/ default/files/publications- attachments/future\_trends\_ in\_the\_world\_leather\_and\_leather\_products\_industry\_ and\_trade.pdf

Toxic price of leather: Notes and video – https://www. gizmodo.com.au/2014/06/how-leather-is-slowly-killingthe-people-and-places-that-make-it/

- The parallels between Gloversville then, and Hazaribagh now, are more than ironic or coincidental – they are instructive. Explain this statement.
- Gloversville is working hard to make a comeback. Describe how this is occurring.

#### **The Glove Theatre**

The Glove Theatre opened in 1914 as a vaudeville house and showed first-run movies until the 1970s when it closed. Locals saved the theatre from the wrecking ball in 1995 and now it hosts live performances.

Source:: https://undark.org/article/leathers-long-shadow-gloversville-new-york/



Modified schematic diagram indicating type of pollutants during the tanning process (UNEP) – https:// www.researchgate.net/profile/Mwinyikione\_Mwinyihija/ publication/215765687/figure/fig7/ AS:277262298566686 @1443115891894/Figure-7-Schematic-diagram-indicatingtype-of-pollutants-during- tanning-process.png

Human Rights Watch: Toxic tanneries – https://www. hrw.org/report/2012/10/08/toxic-tanneries/healthrepercussions-bangladeshs-hazaribagh-leather

Dispatches: Bangladesh's Toxic Tanneries a Glimmer of Hope, But the Outlook is Bleak – https://www.hrw. org/news/2015/05/17/dispatches-bangladeshs-toxictanneries-glimmer-hope-outlook-bleak

Bangladesh's leather industry exposes workers and children to toxic hazards – http://www.pbs.org/ newshour/bb/bangladeshs-leather-industry-exposesworkers-children-toxic-hazards/

Leather working group – http://www. leatherworkinggroup.com/

Your Luxurious Bengali Leather Comes From These Pits Of Hell – https://www.businessinsider.com.au/yourluxurious-bengali-leather-comes-from-these-pits-ofhell-2012-12

Leather Panel UNIDO – https://leatherpanel.org/ publications-categories/trends

#### Podcast

Undark: Wear and Tear – https://undark.org/2017/02/28/ uundark-podcast-12-wear-tear/

#### YouTube

Colors of Water : Dhaka's Leather Tanneries – https://www.youtube.com/watch?v=XL1u5aCo2r0

Bangladesh leather trade's toxic cost – https://www. youtube.com/watch?v=2XclGcuWwYg

Hell for leather: the toxic trade in leather from Bangladesh to the EU – https://www.youtube.com/ watch?v=4A6siB9B4Ak

#### Video

A Tannery worker poisoned by toxic chemicals – https://www.trustedclothes.com/ blog/2016/02/23/24811/



A worker sorts tannery waste for poultry and fish feed on the banks of the Buriganga River in Dhaka, Bangladesh

Source: https://www.businessinsider.com.au/your-luxurious-bengali-leathercomes-from-these-pits-of-hell-2012-12#f8PG18h8hHJbJVTk.99

# Correction

The editor apologises for the missing bibliography from Marco Cimino's article 'Sydney. A Tale of Two Cities' in Volume 49, Edition 2 2017 of the GTANSW Bulletin.

The full bibliography is listed below.

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# **ANNUAL CONFERENCE REFLECTION**

# Connecting the dots: learning and applying for the benefit of students

Fiona Nicholson, MDBA Scholarship Winner

What an amazing experience my first NSW GTA Annual Conference was! This year's conference enabled me to do exactly what the key theme stated: *Collaborate, Inspire, Learn.* 

I went to conference 2017 with the intention of connecting with people, gathering information for the new syllabus and focus areas and driving more amazing stuff for the education that we're delivering through distance to our students, who are all, in some way, in challenging circumstances.

My excitement was palpable at the start, but it is nothing compared to my post conference level. I come to work with new ideas every week and the experience has given me the skill and knowledge to step into a world I couldn't conceive of effectively in February. My teaching has changed; my delivery has changed and my love for Geography has morphed. Thus, my students are more engaged, they are getting creative, they are thinking more freely and outside the box.

I was fortunate to receive one of two MDBA Scholarships that helped fund my conference experience. I would like to acknowledge and thank both the MDBA for the opportunity to participate, learn and represent, and President Lorraine Chaffer and the GTANSW committee for their encouragement and support.

The conference was jam-packed with information and experiences – this was evident from the start when faced with the plethora of workshop choices – my first challenge. Currently I work in the Distance Education context implementing the new Geography syllabus for online delivery so I settled on two key workshop streams; Masterclasses for upcoming focus areas and using technology to enhance learning.

My key takeaways, because of the inspiring and informative keynotes, presentations and workshops have informed (and in some cases changed) my programming decisions and the way we incorporate digital options into the courses being delivered across stages 4 and 5.

#### **Distance education**

To add context and for people who may be unfamiliar, my school caters to isolated, medical, travelling, and gifted and talented students throughout the state, from the ACT, and across the globe. As a result there is the usual breadth and depth of academic rigour required of and for students, along with the need to make adjustments for individualised learning plans. With this in mind the courses we design and deliver need to be flexible, yet challenging. The role of student choice and agency has now moved from my peripheral thinking to front and centre as I design and write. I incorporate this more widely throughout the student learning experience as a direct result of my participation at conference. What I had not encountered was just how much students have been 'told' what to do in their educational experience and how unfamiliar they are with the freedom and opportunity of choice they are being presented with. This has created its own challenge, more so from the older students, but is something we are continuing to develop and nurture.

# So how did conference inspire these actions you may be wondering – how relevant was it?

#### 1. Keynote presentations

As I listened and reflected on the keynote presentations, I discovered there were clear links between the Stronger Smarter ideology and new syllabus programming opportunities. I saw a chance to encourage students to step outside the box and self-direct more, step into their own power, and to engage themselves more through taking personal responsibility - so that internal motivation is driving their learning, not extrinsic stimulus. This was brought home through the STEM presentation on Bushfires for Stage 3. It made me think about several things, but I was particularly struck by my observations about agency and choice that I had never paused to consider. Dr Chris Sarra's message was about student's having infinite potential within and that we should be looking for the positive in that and not sitting in the stereotypes. He blasted away old stereotypes of populations in socio economic areas and as teachers – he put the challenge out there - What are you doing? Are you reinforcing the stereotype or are you moving and taking each child and creating a love for learning and a sacred space aspect to what you do with teaching students? Are you giving them access to new worlds? Do you treat them individually? And do you not only treat them as human but trust that their inner light is there regardless of how and where they are and have come from. I found the connections Dr Sarra made interesting to contemplate and inform the way I design and deliver tasks, particularly to year 7.

Since the conference we have involved stage 4 in using Micro:bit – if I hadn't seen the St Ives STEM presentation I would never have had the impetus to change the direction of the teaching and learning activities in Year 7 and 8. We can incorporate and include these technologies (and others spotlighted at conference from Clare Kinnane, Bec Nicholas and Mick Law) for problem solving, data gathering and creativity specifically in terms of geographical inquiry and fieldwork across stages 4 and 5. As a result we are investigating the purchase of our own drone to enhance our fieldwork experiences ...and that is really exciting.

#### 2. Technologies

The other major takeaway on the tech front was a result of three presentations:

- Geography in the online world. Making connections – Clare Kinnane
- Simple Spatial Technologies for Primary (middle school) Mick Law
- Using BYOD in the Geography Classroom Bec Nicholas

It was like the perfect storm! There was so much inspiration, from the presenters as well as from the constructive collaboration and sharing with colleagues ... and it all made so much sense!

The biggest takeaway for me however was that despite the multitude of apps and options to 'tech' the courses we must remember that technology is only a tool, and deep learning and quality work that demonstrates what the student can achieve in line with course outcomes is the driving educational goal. Bec Nicholas's **most** constructive point was not to flood the students with try it, try it, try it but rather pick 1–3 tools they'll use throughout the year so they upskill in the apps and can advance to others the next year.

The question for me became how can I do this successfully in the DE setting? – Part of the answer lay in the additional PL I have undertaken since conference. The focus on what students can do, paired with the choices they make within their learning context, and their existing tech capability has shaped the way we ask them to do things, no longer prescribing what they use to communicate their work but giving them options to choose their 'digital communication' tool. In the first assessment task this resulted in students meeting their outcomes using software they were already familiar with such as MS Word, PowerPoint, Sway and iMovie. The only caveat placed on them was that we had to be able to read/see it using our system. For a first task, the students shone!

As an ongoing consideration, we have refined our selection to DoE available software, always with 'or an application you are able to use or already have access to' to ensure equity. This approach takes into consideration the reality of students using technology without teacher support and moving beyond the capabilities of their teachers, supervisors and parents and is designed so no student is left 'hanging' and unable to complete a task. It also means students are not limited by those that 'can't', or the technology refusers around them (*and yes there are still plenty out there*). The challenge in Distance Education remains – which apps are most effective for our student's and how do we implement technology in a system that has the possibility a student may never verbally communicate with us throughout an entire course?

We continue to develop our guidelines to give students a choice of technology applications and are formulating guidelines around what, as a faculty (and within school constraints) we are asking the students to use/learn without locking them in to one way of thinking.

#### 3. Content and pedagogy

Our faculty is now using the Mulloon Institute as a case study in Sustainable Biomes, moving toward less test based summative assessment to formative models, using advice from the Changing Places and Interconnections Masterclasses to prompt ideas and creative ways of delivering content.

The incorporation of more effective and authentic links to cross curriculum priority areas, especially Aboriginal and Torres Strait Islander histories and cultures is a direct result of the wisdom, frankness and stories from Bruce Pascoe's **Dark Emu** and the AECG presentations.

# **ANNUAL CONFERENCE REFLECTION**



for Environment, Farming and Society

We believe that we have a responsibility to share our learning, experiences and knowledge not only with today's farmers, but tomorrow's leaders, policy makers, and stewards of the land and nature

#### **Mulloon Institute: Changing Assessment Stimulus**

One change we made in programming was to incorporate learning about the Mulloon Institute into our stage 5 sustainable biomes investigation. We adapted the suggested task on Sustainable Biomes from the Learning and Teaching Directorate to cater to the needs of our students and the online environment in which they are conducting most of their learning.

Students are required to 'Investigate sustainable land/farm management practices in Australia using geographical tools and information with a focus on Mulloon Institute'. They are provided with a range of available web links to direct their research and investigation and could choose their product from the range of items Mulloon farms supply to the food market incorporating paddock to plate concepts. With a scaffolded series of investigation points, students produced reports encompassing eggs/chickens, beef cattle and pigs and made recommendations for other farmers/producers to enhance agricultural yields and sustainability based on the practices they had investigated at the Mulloon farms.

Some of the student observations and discoveries surprised teachers and demonstrated growing awareness of relationships between their food supply and environmental management and production. The next phase of improving this task is to incorporate a virtual tour/experience into future iterations.

See http://themullooninstitute.org

Source: http://themullooninstitute.org/what/#education-section

# **ANNUAL CONFERENCE REFLECTION**

# A Range of Experiences

#### Betty Steele-Smith, GTANSW Bursary winner Taree Christian College

The GTA conference of 2017 provided a range of experiences from the cerebral type case study for the uber Geography teachers who are well equipped and just require that extra stimulus to the early career teacher who is just looking for material to supplement their programs. As an early career teacher, this conference was instrumental in modelling to me what it looks like to teach geography with excellence. Perhaps one could say that it provided me with targets and exemplars to emulate and strive towards.

The conference began on a philosophical level with an exhortation to teach with excellence. Doctor Chris Sarra challenged geography teachers to teach a love for the spaces and communities in which we inhabit, particularly to be 're-enchanted' by a sense of culture and connection to the land. Something I have become increasingly aware of as a Geography teacher in regional Australia.

A wide array of seminars seeking to equip teachers for the implementation of the NSW K–10 syllabus were available. On a basic level, the conference was like 'porn' for geography teachers. Every seminar provided hours of material for lessons. Some easy lessons allow for a 'plug and play' approach for those times where you are strapped for a lesson. While appearing simplistic, these lessons were often profound in their learning outcomes and had the careful thinking and crafting already completed by experts in the field. Social enterprises such as Cool Australia and Sydney Water presented alternate ways of delivering syllabus material accompanied a myriad of free online resources to be plundered freely and easily.



PHOTOS: Environmental Education Centres and Zoos (EECZ) AND Sydney Olympic Park exhibited at the conference to promote their fieldwork programs



Some seminars provided lesson ideas that required teacher preparation and adaptation and prompted teachers to think about the way shape the nature of fieldwork. These presented as entire units of work that are able to be integrated with skills. Oxfam Australia, The Big Issue and the 'Thankyou' company suggested a range of techno-savvy and down to earth methods of delivering material from Skype Conferences with the homeless to the more labour intensive 'Hunger Banquet' to help students better grasp the nature of spatial inequalities.

The conference provided ample material to cover the 'bread and butter' of the Geography teacher. In addition, there were inspirational and out of the box seminars on using a physical sandbox synced to a GIS system to teach topography, using multiple modes of ICT to present and model geographical information seminars on fieldwork and content that is relevant and recent.

The GTANSW conference served as a key reminder of the rigorous nature of geography as a discipline. It certainty acted as a reinvigorating agent for teachers like myself to apply some of these strategies and skills and to go forth and deliver Geography lessons with excellence.

# Some Teaching Ideas – Part 2

#### Lorraine Chaffer President GTANSW Geography Education Consultant and author

#### The following pages are a selection of slides from a presentation I gave to the Australian Geography Teachers Association Conference in Auckland 2015.

The concept of liveability can be examined at a variety of scales from a local street or neighbourhood (liveable streets), to nations and regions (wealth and poverty / developed/ developing, rural / urban, Asia) and global (Earth, ecological footprints, biocapacity). Students should investigate a range of places in this topic and include the cross-curriculum priorities where relevant – Asia, Aboriginal and Torres Strait Islander histories and cultures and Sustainability.

**Part 1** (Geography Bulletin Edition 2, 2017) suggested activities for introducing liveability and the factors that influence people's perceptions of liveability.

**Part 2** examines how liveability can be measured or assessed, factors influencing liveability, change over time and ways of enhancing liveability. Different geographical tools can be used to investigate the liveability of places eg. photographs, tables, maps, population profiles and spatial technologies

It is important that whatever places, concepts and tools are used to study Place and Liveability, they should link to the key syllabus concepts including;

• Access to services and facilities

- Community identity
- Connectedness
- Safety
- Environmental quality

# Global rankings and criteria for assessing / measuring liveability

These tools are used to compare the liveability of large cities across the world. Each uses different criteria, have a global perspective and do not consider differences in liveability within cities. City liveability rankings are traditionally used by governments and corporations wanting to assess "the degree to which expatriates enjoy the potential standard of living in the host location" (liveablecities.org). This needs to be explained to students.

These rankings can be a useful tool for developing criteria to assess liveability in a local place. By investigating the criteria used to produce these rankings students can develop their own set of liveability rankings with which to assess and compare the liveability of local places (such as a street, park or other public place) or places pictured in photographs or videos.

			Gla	660	ıl cít	y rank	in	gs			
The Economist Tatelligence Unit Oritoria: 127 entres covering stability, heathcare, culture, environment, edocation and infrastructure		Mercer Quality of Living Survey Eriteria: 221 colus based on 39 criteria such as housing, recreation, schools and natural environment			Monocle lifestyle magazine Criterin: 25 estas covering safety, international links, climate, public transport, environmental issues and orban design						
Rank	City	Country	Score	Rank	City	Country	Score	Rank	City	Country	Sco
1	Melbourne	Australia	97.5	4	Vienna	Austria	(01)	I	Zurich	Switzerland	(02)
2	Vienna	Austria	97.4	2	Zurich	Switzerland	(02)	2	Helsinki	Finland	(01)
3	Vancouver	Canada	973	3	Auckland	NZ	(04)	3	Copenhagen	Denmark	(03)
4	Toronto	Canada	97,2	4	Munich	Germany	(07)	4	Vienna	Austria	(06)
5	Calgary	Canada	96.6	5	Düsseldorf	Germany	(06)	5	Munich	Germany	(04)
7	Sydney	Australia	96.1	7	Frankfurt	Germany	(07)	7	Tokyo	Japan	(09)
	1			-							



There are three main liveability rankings /indices used to compare cities at a global scale although new measures such as the Global Happiness Index are becoming more popular by recognising that other factors linked to human wellbeing are also indicators of liveability.

Note: A good activity is to research the most recent liveability rankings for the three main global city measures and look for changes over time to determine why liveability changes at a city-wide scale.

Use the rankings to examine the features of the most and least liveable cities at a global scale.

The criteria used to develop global city rankings can be linked to syllabus concepts including safety and access to services and facilities. Housing affordability has become a key indicator of liveability in Australia's large cities. This can lead to an investigation of ways liveability is being or can be enhanced at a city scale, particularly for those places considered least liveable.





Urban - large / small Rural Remote

Gaps in population profiles reflect that places are less liveable for some groups

#### **Population and** liveability

Population profiles reflect the liveability of places within countries. Gaps in these profiles indicate migration to other places some age groups see as more liveable

GeoWorld 7 NSW





**Population issues** can impact on liveability eg ageing, highly dependent populations eg large % under 15 years of age. Use visual stimulus to promote discussion on how these issues impact on the liveability of places.

This type of activity is suited better to students needing more higher order thinking and can be used as a tool for differentiation.

#### **Environmental quality influences liveability**

Environments can be aesthetically and climatically attractive, resource rich or poor and well managed and cared for or polluted and degraded. Environmental quality can be impacted by natural and human processes eg drought and war and therefore can change over time.



Many places Australians would consider unliveable because of their harsh natural environments are liveable by those seeking to extract valuable resources. When resources run out the very environmental feature that attracted people disappears and populations decline – leading to the creation of ghost towns.

When resources are degraded, or depleted, liveability declines.



#### Liveability changes over time

In many places, liveability is impacted by *natural and human factors*. When countries have limited resources to deal with these environmental issues, liveability is affected.

Liveability improves when enhancement strategies are implemented eg urban renewal, development



Climate change brings with it other environmental changes that impact on liveability. Examples include sea level rise and loss of productive land and settlements, patterns of weather and climate such as an increase in cyclones and the incidence of disease.

# Clímate change and líveabílíty



#### **Enhancing liveability**

Why?

Strategies can be implemented across local to global scales. Improved street lighting at a local scale can enhance liveability by improving safety while strategies to reduce global climate change rely on international cooperation.



Choose a range of strategies chosen to suit student abilities when investigating this section of the syllabus. A local activity in which students propose a strategy to enhance the liveability of a local place would fit well here.

There is great potential for differentiation here where strategies can range from simple changes to streetscapes to more complex such as creating transit oriented developments in cities.



http://www.urbandesign.gov.au/downloads/files/INFRA1219\_MCU\_R\_SQUARE\_URBAN\_PROTOCOLS\_1111\_WEB\_FA2.pdf

#### At a local scale



# Small changes can enhance liveability



Students can be asked to propose changes to a local street and show proposed changes on an annotated photograph or map such as Scribble Maps. Link to concepts such as safety, access to services and facilities, community identity and connectedness.

# Enhancing liveability: Liveable streets

D. Bollards preven motorists parking on pavements and can be used to stop

cars entering streets

I. Traffic light

with a lo ian interval gives pede time o cro ss bef

E. Ded lanes get buses out of traffic and make trips faster and predictable.

J. Raised

textured crosswalks c natural speed bumps and m





than places to be driven through

H. Separated bike

lanes. Dedicated la provide physical protection and encourage bike use

A simple activity easy to adapt to classroom use to "develop students' ability to evaluate the liveability of their own place and to investigate whether it can be improved through planning" Australian Curriculum Geography year 7 level description.

Have students take or select a streetscape and using "Tablet" Apps or drawing tools to show changes that will improve liveability.

It is important to use interesting stories that illustrate successful liveability strategies such as the cable transport system in Medellin that links slum dwellers to city employment, bypassing the informal street system previously used by slum dwellers.

Pedestrian Street

F. Curb extensions

are safer - reducing crossing distances and by narrowing the street they reduce drivers speeds.

Lighting 't be just for

Street Tree

lantings provide ade and oxygen ake the street lo

G. Speed bumps

### Enhancing liveability: Medellin



http://www.designother90.org/cities/solutions/medellin-metrocable-and-northeast-integral-urban-project

Transport services enhance liveability for slum dwellers



Consider what Australian places can learn from places overseas considered to be highly liveable. Use these ideas when proposing local solutions to liveability challenges. *Asian* examples could be used here eg. The greening of Singapore or China's fast trains network.

Placemaking is a relatively new concept used in planning the renewal or provision of places for people to live. The features of good places link to factors affecting liveability.



#### **Incorporate Cross Curriculum Priorities**

(Asia, Sustainability, Aboriginal and Torres Strait Islander Histories and cultures)



1. Consider the cultural needs of indigenous people when proposing or investigating strategies to enhance liveability for Australia's Aboriginal peoples.

#### 2. Links to sustainability



#### 3. Link to Asia

Use interactive tools such as Gapminder and Worldshapin to make comparisons and propose solutions. Extend gifted students by linking development strategies with liveability.

Choose Asian countries when making comparisons.



#### Make it fun

Create learning activities where students can apply their learning eg to a part of the school grounds or a rooftop. This can be a hypothetical e.g. "imagine the roof of our school hall is flat", or real e.g. Find the least liked part of the school grounds, assess why it is not liked and propose strategies to improve its attractiveness to students.



# Choose activities and examples wisely

In the NSW Geography Syllabus Place and Liveability can be taught in year 7 or 8 (Stage 4) while Changing Nations can be taught in Years 9 or 10 (Stage 5). The points raised in this slide (produced for an Australian audience) are equally applicable as programing considerations.

### Warning

Enhancing liveability is connected to increasing sustainability – economic, social and environmental

In changing Places in Year 9 students will look at strategies to make urban places more sustainable and liveable

Program Year 7 to avoid repeating strategies that are more appropriate to urbanisation in Year 9

#### Resources and Fieldwork

Find resources already developed to support this topic and adapt to the needs of your students and school resources.



http://www.acara.edu.au/curriculum/worksamples/Year\_z\_Geography\_Portfolio.pdf



Use this Geogspace survey chart to develop one appropriate to your location and the needs of students. Using surveys such this provide the essential fieldwork component and allow students to apply their learning to the real world.

Geogspace templates http://www.geogspace.

Web curation sites such as Scoop.it and Pinterest are a source of contemporary articles and a place to collect your own resources for personal or student use.

This full PPT presentation can be found in the members only resources section of the GTANSW website.



# **PRIMARY RESOURCE**

# **Central Coast Council Multi-Touch Book: WETLANDS**

#### Target: K–6 students and educators

A Multi-Touch book on wetlands has been developed by Central Coast Council to raise awareness of Australia's amazing wetlands and to encourage positive behaviours to care for them. The book contains beautiful photography, videos and interactive activities.

Course outlines / lesson programs have been written to meet the requirements of the K–6 Geography syllabus. A wetland study can range from a small pond in the school grounds or a larger wetland like Porters Creek Wetland or Avoca Lagoon on the Central Coast. The course outlines show how a study of a wetland can be can be incorporated into student investigations of places, environments and people from Kindergarten to Stage 3. Fieldwork is an integral component of the activities in the book and activities in the lesson outline.

A sample Stage 3 lesson outline has been included here. Others programs are on the Central Coast Council website information hub at http://www. loveourlivinglakes.com.au/learn/resources/

#### Or follow these links:

🗾 Early Stage 1 (348.96 KB) Stage 1 (306.79 KB)

Stage 2 (433.75 KB)

Stage 3 (355.35 KB)

nal & Technical | Education | Central Coast Council

Wetlands Natural Environments >

About the Book This Multi-Tox

Central Coast Council ? talk Ratings and Res



Published Feb 6, 2017

ENHANCED This book includes video.

REQUIREMENTS

To view this book, you must have iPad with Books 2 or later and IO or later, or or iPhone with IOS 8.4 later, or a Mac with OS X 10.9 or i



Wetlands

Animals



#### Case Study - Green and Golden

Activity - Frog Can

# adapted to other wetlands in NSW.

These outlines and the Multi–Touch book can be

The book is available for download with iBooks on a Mac or iOS device, however the interactive features may work best on an iOS device.

https://itunes.apple.com/au/book/wetlands/ id1244146259?mt=11

#### **Animal Detectives**

Many animals are cryptic and you may not be able to see them when you visit a wetland. However, look a little closer and you might notice tracks, droppings, animal remains, shells or even hear frogs and birds calling.

Wetland sounds



Fur and bones in this fox scat tell a story. What an think it has eaten?

By identifying signs and evidence you will be able to work out which animals live in the wetland even if you can't see them.

Field Work- Animal Evidence

age positive behaviours to care for them. This book con

### Central Coast Council

#### COUNCIL LEADING THE WAY IN WETLAND EDUCATION

#### 21 June 2017

Central Coast Council is helping lead the way for the next generation to be involved in protecting the Coast's waterways by launching its first ever free Multi-Touch Books.

Two digital books have been developed for preschoolers, primary school students and educators. The books highlight the importance of wetlands, what lives in them and how everyone can play a role in looking after them.

Council Group Leader, Ms Julie Vaughan, said education was a key to helping protect the wetlands and Council is heading straight to the classroom with an innovative and interactive learning tool designed to appeal directly to kids.

"Working with educators and kids is nothing new for Council, we have been doing this for some time – but what is different is the way we are going about it which came directly from feedback from teachers across the Coast," Ms Vaughan said.

"The teachers wanted something that could be easily used in the classroom and out in the field – so we delivered the first iBooks for Council.

"Now the resource is digital, teachers can easily link it up to the smartboards in the classroom for all the students to see.

"This exciting project is more than a book – being interactive the books contain songs, photos and videos as well as practical activities for the classroom and out in the field.

"The books are full of generic information that can relate to wetlands across the country, but they also have localised case studies on Porters Creek Wetland and Avoca Lagoon."

Using these Multi-Touch Books, students will be able to explore photos with interactive captions, complete field sketches, listen to wildlife calls, take photos, touch and drag images into the correct order or have the answer spring to life in a chapter review. Completed activities can be submitted to the teacher electronically only from an iPad or iPhone.

Council Administrator, Mr Ian Reynolds, said protecting our waterways and the environment was a key priority for Council and the community and this new technology would be crucial in getting the next generation involved as well.

"The books not only educate the students in class, but they also can help the wider community learn about the importance of wetlands and what they can do to protect them," Mr Reynolds said.

"If we can actively engage our younger generation now in the importance of protecting our waterways and environment they will become their champions now and help ensure their future. We all have a role to play and this project is a great example of Council working with the community to deliver an important resource that can be used for free and in return help educate our community on our local environment."

These books have been developed with local early childhood educators and primary school teachers to support the Commonwealth Government Early Years Learning Framework and the NSW Syllabus for the Australian Curriculum (Geography and Science & Technology K–6). Additional lesson outlines will be available on Council's estuary website loveourlivinglakes.com.au

https://www.centralcoast.nsw.gov.au/council-leading-way-wetland-education/

# **PRIMARY RESOURCE**



### Stage 3 Geography: Contemporary land use – Porters Creek Wetland

Focus area: Factors that shape places					
Factors that change environments	Humans shape places				
<ul> <li>Key inquiry questions</li> <li>How do people and environments influence one another?</li> <li>How do people influence places and the management of spaces within them?</li> </ul>					
Content focus Students: - investigate how people change the natural environment in Australia - examine ways people influence the characteristics of places, including the management of spaces					
Outcomes         A student:         -       describes the diverse features and characteristics of places and environments GE3-1         -       explains interactions and connections between people, places and environments GE3-2         -       compares and contrasts influences on the management of places and environments GE3-3         -       acquires, processes and communicates geographical information using geographical tools for inquiry GE3-4					
<b>Overview</b> The geographical inquiry process will investigate planning issue as a case study at a local or regist students will examine the geographical character the place and a range of people with varying per- and sustainability considerations. Students will making processes and roles and responsibilities Note: The capacity of students to engage with early in Year 5. Teachers will need to adjust and Teachers can choose whether the case study is	ate a contemporary geographical land use or ional scale. Through investigation of the issue, cteristics of the site, the interconnections between points of view, the role of government in the issue, Il also develop understanding of the decision- es of the different levels of government. the inquiry will be much greater in Year 6 than a scaffold learning activities as appropriate.				

#### Assessment

Many of the activities require students to demonstrate their learning. These activities can be used to assess student learning at various stages throughout the inquiry process.

### Factors that change environments

#### Students:

- investigate the ways people change the natural environment in Australia and another country, for example:
  - examination of how people, including Aboriginal and Torres Strait Islander Peoples, have influenced each country's environmental characteristics eg land clearing, use of fire

#### Humans shape places

Students:

- investigate how people influence places, for example:
  - description of who organises and manages places eg local and state governments
  - identification of ways people influence places and contribute to sustainability eg roads and services, fire management strategies
  - examination of a local planning issue; the different views about it and a possible action in response to it

#### Student-centred inquiry into Porters Creek Wetland

Students work in small groups to investigate Porters Creek Wetland. They create a short presentation, providing a balanced view that discusses the positive and negative outcomes identified in the investigation.

#### Acquiring geographical information

#### Question:

What is the impact of increasing urban development on Porters Creek Wetland?

Geographical questions:

- Where is Porters Creek Wetland located?
- What was the 'country' like when the Darkinjung people lived in and around Porters Creek Wetland?
- What are the geographical features of the place today?
- Why is the Porters Creek Wetland environment important?
- How are the places surrounding Porters Creek Wetland organised and used?
- What are the impacts of land use change?
- Who will be advantaged and who will be disadvantaged by land use change?
- What actions are required to ensure the sustainability of Porters
- Creek Wetland?

#### **Resources:**

Use the Porters Creek Wetland case study in Central Coast Council's Wetlands Multi-Touch Book available on the iBookstore

#### Acquire data and information

Examples of data and information sources:

- Use a range of maps to describe Porters Creek Wetland. Use appropriate spatial technologies and visual representations.
- Research the Darkinjung people: how they managed the land, the fresh water sources, what they planted, harvested and hunted to meet their needs. Consider whether Porters Creek Wetland had seasonal or ceremonial significance?
- Study current photographs of Porters Creek Wetland and identify the main geographical features.
- Fieldwork: visit Porters Creek Wetland. Draw and label the geographical features in a field sketch. Use other fieldwork techniques such as recording human uses through photographs, conducting biodiversity surveys, assessing vegetation distribution, water quality testing, mapping land uses and observing impacts. For assistance contact Central Coast Council or Rumbalara Environmental Education Centre.
- Source appropriate data and other statistical information relating to the issue, e.g. population growth forecasts. See http://profile.id.com.au/wyong/home
- Develop a role play activity to represent the perceptions of different community members on the impact of urban development around Porters Creek Wetland on people, flora and fauna and water quality (developer, neighbour, environmentalist)
- Determine the role of government in planning, developing or managing the place. Use the Porters Creek Wetland Case Study in Central Coast Council's Wetlands Multi-Touch Book.

#### Processing geographical information

Use geographical tools to collate and review the data and information collected and evaluate for its usefulness, for example:

- On a topographic map or satellite image as a base map, use mapping overlays to describe geographical features of Porters Creek Wetland and its surroundings. Analyse changes, spatial distributions and patterns. Use aerial photos in the Porters Creek Wetland Case Study in Central Coast Council's Wetlands Multi-Touch Book.
- Use photographs and research information to construct a **table** representing past, present and future uses of Porters Creek Wetland. Analyse the changes over time and make predictions for the future.
- Assemble and annotate **photographs** to provide a visual representation of Porters Creek Wetland. Analyse and label interconnections.
- Develop consequences charts to explain predicted impacts (positive and negative).
- Construct graphs to represent diversity of flora and fauna (biodiversity), and a précis map showing vegetation type and land use. Analyse and interpret the data.
- Use a **T-chart** to represent data on perceived positive and negative impacts gathered through surveys. Interpret patterns and trends.
- Construct a **flow chart** or **concept map** to explain the role of government, and other major stakeholders, in the role of wetland management and urban development.
- Ensure students have developed their understanding of ways humans influence Porters Creek Wetland and the different perceptions about its management.

Discussion questions:

- o Does the information relate to the inquiry questions used to shape the investigation?
- o Has the investigation examined the perspectives of different people?
- o Can conclusions be drawn about positive and negative aspects related to the investigation?
- o Has sustainability been considered?

#### Communicating geographical information

#### Communicate:

Students work in small groups to develop a short **presentation** to convey their knowledge and understanding resulting from the investigation. Students may put forward arguments and opinions, support a specific course of action and explain the impact of this action on the environment.

The presentation should include:

- A clear description of the investigation and some of the consequences for the environment;
- Tools such as maps, satellite images, graphs, statistics, flowcharts, labelled photographs, diagrams, illustrations and other labelled visual representations;
- Information on the traditional use of Porters Creek Wetland by the Darkinjung people;

#### Communicating geographical information (continued)

- A description of the role of government in organising or managing Porters Creek Wetland; and,
- A description and justification of a specific point of view and/or course of action in response to the investigation.

#### Resources

NSW Planning and Environment websites, e.g. Sydney's Growth Centres; A Plan for Growing Sydney – http://www.planning.nsw.gov.au/Plans-for-Your-Area/Regional-Plans#

Central Coast population forecasts: http://forecast.id.com.au/wyong/home & http://forecast.id.com.au/gosford/home

Tuggerah Lakes animated film: www.loveourlivinglakes.com.au

SIX Maps: Satellite images and maps - https://maps.six.nsw.gov.au/#



Porters Creek Wetland images sourced from http://www. blueplanet.nsw.edu.au/porterscreek-case-study/.aspx
# **K–12 RESOURCE**

## GEO-INQUIRY: A National Geographic resource

The National Geographic Geo-Inquiry Process aligns nicely with the Geographical inquiry skills component of the Australian Curriculum Geography and NSW Syllabus K–10 and Stage 6 – with special relevance to the Senior Geography Project.

PART 1 EDUCATORS GUIDE: A step by step guide for teachers





Sample pages from the Educators Guide and classroom poster



## **K–12 RESOURCE**

## PART 2: Student Resource pack and examples

A set of templates for students to use to guide their inquiry.

## GEO-INQUIRY PROCESS RESOURCE PACKET LIST

#### **Table of Contents**

- 1. Geo-Inquiry Questions worksheet
- 2. Possible Geo-Inquiry Questions worksheet
- 3. Practicing Geo-Inquiry Questions worksheet
- 4. Asking the Community worksheet
- 5. Refining Your Geo-Inquiry Question worksheet
- 6. Background Information worksheet
- 7. Deciding What Data You Need worksheet
- 8. Planning Data Collection worksheet
- 9. Evaluating Resources worksheet
- 10. Taking Notes worksheet
- 11. Contacting Community Experts worksheet
- 12. Conducting Interviews worksheet
- 13. Analyzing Your Data worksheet
- 14. Creating a Rough Draft Map worksheet
- 15. Creating the Final Version of Your Map worksheet
- 16. Analyzing Geo-Inquiry Stories worksheet
- 17. Choosing the Way to Tell Your Geo-Inquiry Story worksheet
- 18. Preparing to Tell Your Geo-Inquiry Story worksheet
- 19. Geo-Inquiry Storyboard worksheet
- 20. Tracking Geo-Inquiry Story Elements worksheet
- 21. Developing an Action Plan worksheet
- 22. Choosing How To Share your Geo-Inquiry Story worksheet
- 23. Ongoing Reflection form
- 24. Planning Your Presentation worksheet
- 25. Final Reflection form
- 26. Peer Review form
- 27. Taking Action handout
- 28. Sources of Information in Your Community handout
- 29. Collecting Data in the Field handout
- 30. Vocabulary handout
- 31. Developing a Survey handout
- 32. Taking Photographs and Videos handout
- 33. Photograph and Video Release form
- 34. Photography: The Basics handout
- 35. Videography: The Basics handout
- 36. Basic Types of Maps handout

- 37. Choosing the Graph You Will Use handout
- 38. Collecting Geospatial Data handout
- 39. Creating Your Geo-Inquiry Map with Your Solution handout
- 40. Storytelling: The Basics handout
- 41. Geo-Inquiry Presentation Rubric
- 42. Geo-Inquiry Story Rubric
- 43. Self-Evaluation form
- 44. Geo-Inquiry Process Organizer worksheet
- 45. Geo-Inquiry Tubric
- 46. National Geographic Geo-Inquiry Case Studies
  - a. In Search of a Healthy Ocean Ecosystem b. Protecting Human History in Egypt with a View Above



**Unpacking Your Geo-Inquiry Question** 

eak down your Geo-Inquiry Question by listing the Need-to-Knows that will help to answer it. After you have listed your ed-to-Knows that make up your Geo-Inquiry Question, look back at each Need-to-Know and write the specific data you will Break dos need to answer it.

Need-to-Knows	Data Neodod

## PLANNING DATA COLLECTION

Use this table to plan your data collection, including all necessary tools, such as surveys or data sheets

Type of Data	Why You Need It	How You Will Collect It	Tools You Will Need
	-		
			-

Source: https://www.nationalgeographic.org/education/programs/geo-inguiry/?utm\_source=NatGeocom&utm medium=Email&utm\_content=Geoeducator\_Newsletter\_20170715&utm\_campaign=Geoeducator&utm\_rd=105204



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Cardholder Name					
Signature					



## **GEOGRAPHY FIELDWORK COMPETITION**

The Geography Teachers' Association of NSW/ACT (GTA NSW/ACT) organises an annual competition for students and schools to foster an enthusiasm for Geography through engagement and rewards. The emphasis of the competition is the use of fieldwork and the gathering of primary and secondary data as core skills in students' study of Geography. Teachers are encouraged to use the competition as a form of authentic assessment for their teaching and learning programmes. The competition is open to all primary and secondary schools in NSW and ACT. Entries are welcome from both members and non-members of GTA NSW/ACT.

In 2017, the submission of entries and the prize categories have been updated to better reflect the requirements of the new Australian K–10 Geography Curriculum and the central place that inquiry holds within Geography. Firstly, the categories have been modified to reflect the Australian K–10 Geography content now used in both NSW and ACT. The Brock Rowe Senior Geography Fieldwork Competition will be open to entries of HSC Senior Geography Projects, International Baccalaureate Diploma Geography Internal Assessments or fieldwork based Depth Studies for ACT participants. There will also be a form available on the GTA NSW/ACT website to submit digital entries. Entries must be submitted either by mail or online by Friday 24 November 2017.

Please complete and return a student entry form either by mail or online with all student entries by Friday 24 November 2017.

## **SECTION 1: NATURE OF THE COMPETITIONS**

 The "Investigating Places" Primary Fieldwork Competition Three subcategories: Years K-2, Year 3-4, Years 5-6

This section is open to Primary Students across NSW and ACT. Entries can be made by individuals, groups or classes.

- Identify a Geographical inquiry that demonstrates the interaction of People, Places and Environments
- Undertake fieldwork to gather primary data
- Support fieldwork with secondary data if required
- Present research findings

#### 2. The Geographical Fieldwork and Research Competition: Five subcategories: Years 5-6, Year 7-8, Year 9-10, Life Skills and Year 11-12

This section is open to all Geography Students across NSW and ACT. Entries can be made by individuals or groups. Inquiry topics must be clearly relevant to the Australian K-10 Geography Curriculum, the NSW Elective Geography Syllabus or the IB Geography courses at any level. There is an expectation that geospatial technologies will play a role in either the gathering, organising or presentation of student research.

- Identify a Geographical inquiry topic relevant to any of the Geographical concepts (Place, Space, Environment, Interconnections, Scale, Sustainability, Change) or the Australian crosscurricular priorities (Aboriginal and Torres Strait Islander histories and cultures, Asia and Australia's engagement with Asia or Sustainability)
- Undertake research using both secondary data and primary fieldwork such as that obtained during interviews, questionnaires or other fieldwork methods.
- Analyse data gathered
- Present research findings

## ARTHUR PHILLIP AWARDS 2017 GEOGRAPHY FIELDWORK COMPETITION

## NATURE OF THE COMPETITIONS

#### 3. The Dr Don Biddle Places and Environments Study (Year 9 and 10 only)

Formerly, this category was targeted towards Year 10 Students completing a Research Action Plan. This will still be the case for 2017, as most NSW Schools are required to complete the old 7-10 Geography Syllabus. However, entries are also open to NSW or ACT schools teaching the Australian K-10 Geography Curriculum content in 2017. Inquiry topics must be relevant to the Year 9 and 10 content. There is an expectation that geospatial technologies will play a role in either the gathering, organising or presentation of student research.

- Undertake research into a place or environment relevant to the Year 9 and 10, Australian K–10 Geography Curriculum
- Undertake fieldwork to gather primary data
- · Support fieldwork with secondary data if required
- Organise and analyse the data gathered
- Present research findings

#### I. The Brock Rowe Senior Geography Fieldwork Competition

This section is open to Senior Geography Students across NSW and ACT. Only individual entries will be accepted. The competition is open to either Senior Geography Projects, International Baccalaureate Geography Internal Assessments or a Depth Study for ACT participants.

- Undertake an HSC Senior Geography Project, International Baccalaureate Internal Assessment for Geography or ACT Depth Study that uses fieldwork to gather primary data
- · Support fieldwork with secondary data if required
- Analyse data gathered
- Present research findings
- Evaluate the research methodologies used and the ethical aspects of research undertaken

#### 5. The Dr Susan Bliss Cross-Curricular Priority Awards

The Dr Susan Bliss Awards are available for entries from any category or subcategory that demonstrates significant achievement or development of understanding in any of the three Australian K-10 Geography Curriculum cross curricular priority areas; Aboriginal and Torres Strait Islander histories and cultures, Asia and Australia's engagement with Asia or Sustainability.

#### 6. The Dr Maurine Goldston-Morris Civic and Citizenship Awards

The Dr Maurine Goldston-Morris Civic and Citizenship Awards are available for entries from any category or subcategory that demonstrate civic action has occurred at either the individual or group level, as a result of the research/fieldwork activity.

#### 7. The Dr Maurine Goldston-Morris Teacher Awards

The Dr Maurine Goldston-Morris Teacher Awards will be allocated to teachers for outstanding involvement in the Geography Fieldwork Competition during 2017.

## **ARTHUR PHILLIP AWARDS 2017** SECTION 2: ENTRY INFORMATION

### **ENTRIES**

**There are no entry fees for 2017**. The fee structure will be revised when the the new Australian K–10 Geography curriculum is fully implemented across NSW by 2018.

Each school can submit up to FOUR (4) entries in each category.

#### Final date for competition entries to be received Friday 24 November 2017

All **postal entries** MUST have a Student Entry Form (see over page) fully completed and securely attached to be considered. Make sure the correct section is indicated on the entry form. All packages should be clearly marked as Geography Fieldwork Competition. Entries can be mailed to:

#### GTA NSW Office (PO Box 699 Lidcombe 1825)

Please contact our office on 9716 0378 prior to delivering entries to the following location:

#### Lower Ground Floor, COS Building, 25 Nyrang St. Lidcombe

Enquiries via email to the GTA NSW office - gta.admin@ptc.nsw.edu.au

Hardcopy entries may be in a book or loose leaves (with reinforced rings), mounted on cardboard (limit 2 sheets of 65 x 55cm).

All digital entries MUST be submitted as a hyperlink through the online entry form available on the GTA website (https://goo.gl/forms/dhgIBZkSCoV9RSz62). All digital presentation formats, such as videos, web pages and podcasts are welcome. Slide presentations (Such as PowerPoint, Slides or Pages) will have a maximum slide number of 20. It is the responsibility of the student and supervising teacher to ensure hyperlinks are functional and able to be accessed by markers.

No models will be accepted.

All entries will be available for collection at the end of the award ceremony. GTA NSW/ACT is unable to return uncollected entries to schools.

#### PRIZES:

Prizes will be awarded for the first, second and third place entries each competition category or subcategory where available.

#### AWARDS:

Awards will be allocated to each category according to marking criteria. The presentation of awards will take place at the Arthur Phillip Awards ceremony in early 2018. Award recipients, their parents and teachers will receive invitations.

SECTION 3: STUDENT ENTRY FOR	RM
This form MUST be fully completed and securely attached to each entry. (One form per entry – please photocopy)	PLEASE PRINT CLEARLY
EACH SCHOOL CAN SUBMIT UP TO FOUR ENTRIES IN EAC SECTION OR SUB CATEGORY	:H
STUDENT (full name)	
SCHOOL	
SCHOOL YEAR/STAGE TEACHER	
TEACHER EMAIL:	
<b>SECTION OF ENTRY:</b> (Please tick <b>ONE</b> sub category only)	
1. The "Investigating Places" Primary Fieldwork Competition Years K-2 Years 3-4 Years 5-6	ONLY ON SECTION
2. The Geographical Fieldwork and Research Competition Years5–6 Years 7–8 Years 9–10 Life Skills Years 1	BE SELECT
3. The Dr Don Biddle Issues in Australian Environments Fieldwork Years 9 and 10 students only	Competition
4. The Brock Rowe Senior Geography Project Fieldwork Competiti	on
FITLE OF THE PROJECT	
SYNOPSIS	
CERTIFICATE OF ORIGINALITY	
I certify that this is all my original work:	

ALL ENTRIES MUST BE RECEIVED BY CLOSE OF BUSINESS - FRIDAY 24 NOVEMBER 2017

### ALL ENTRIES MUST BE RECEIVED BY CLOSE OF BUSINESS – FRIDAY 24 NOVEMBER 2017



## **ARTHUR PHILLIP AWARDS 2017 GEOGRAPHY FIELDWORK COMPETITION**

## SECTION 4: SCHOOL REGISTRATION AND SUMMARY OF ENTRIES FORM

## This form must accompany the full set of student entries from your school

### School details:

### SCHOOL NAME

SCHOOL ADDRESS

ORGANISING TEACHER

BEST PHONE CONTACT FOR TEACHER

BEST EMAIL CONTACT FOR TEACHER

#### **Return of entries:**

I will organise collection

Please organise return to above address This option includes postage & handling fee

#### Summary of entries:

Competition section entered	Number of entries (maximum of FOUR in each section or sub category)
1 GTA Fieldwork & Visual Presentation	
2 Global Education Research Fieldwork	
3 Dr Don Biddle Fieldwork	
4 Brock Rowe Senior Geography Fieldwork	
	TOTAL ENTRIES:

All packages should be clearly marked as 'Geography Fieldwork Competition'. Entries can be mailed to:

GTA NSW Office (PO Box 699 Lidcombe 1825)

Please contact our office on 9716 0378 prior to delivering entries to the following location:

Lower Ground Floor, COS Building, 25 Nyrang St. Lidcombe

# **ADVICE TO CONTRIBUTORS**

### Editorial policy attempts to:

- promote material which will assist the study and teaching of geography
- encourage teachers to share their ideas on teaching geography
- provide a means by which teachers can publish articles
- inform readers of developments in geographical education

Articles are sought reflecting research and innovations in teaching practices in schools. From time to time issues of the Bulletin address specific themes. Once published articles become the property of GTA NSW

### Refereeing

All suitable manuscripts submitted to the Geography Bulletin are subject to the process of review. The authors and contributors alone are responsible for the opinions expressed in their articles and while reasonable checks are made to ensure the accuracy of all statements, neither the editor nor the Geography Teachers' Association of New South Wales Inc accepts responsibility for statements or opinions expressed herein.

### Books for review should be sent to:

The GTA NSW Council PO Box 699 Lidcombe NSW 1825

### **Editions**

There are four bulletins each year – two published each semester.

### **Notice to Advertisers**

'Geography Bulletin' welcomes advertisements concerning publications, resources, workshops, etc. relevant to geography education.

- FULL PAGE (26 x 18cm) \$368.50 Special issues \$649.00
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- 1. *Objective:* The Geography Bulletin is the quarterly journal of the New South Wales Geography Teachers' Association, Inc. The role of the Geography Bulletin is to disseminate up-to-date geographical information and to widen access to new geographic teaching ideas and methods. Articles of interest to teachers and students of geography in both secondary and tertiary institutions are invited, and contributions of factually correct, informed analyses, and case studies suitable for use in secondary schools are particularly welcomed.
- 2. *Content:* Articles, not normally exceeding 5000 words (no minimum specification), should be submitted to the GTANSW Office gta.admin@ptc.nsw.edu.au or by mail to: . *PO Box 699, Lidcombe, NSW 1825* who will forward to the editor: Submissions can also be sent directly to the editor: Lorraine Chaffer (lchaffer@tpg.com.au)

Articles are welcomed from tertiary and secondary teachers, students, business and government representatives. Articles may also be solicited from time to time. Articles submitted will be evaluated according to their ability to meet the objectives outlined above.

- 3. *Format:* Digital submission in Word format. Tables should be on separate pages, one per page, and figures should be clearly drawn, one per page, in black on opaque paper suitable for reproduction. Photographs should be in high resolution digital format. An indication should be given in the text of approximate location of tables, figures and photographs. Every illustration needs a caption. Photographs, tables and illustrations sourced from the internet must acknowledge the source and have a URL link to the original context.
- 4. *Title:* The title should be short, yet clear and descriptive. The author's name should appear in full, together with a full title of position held and location of employment.
- 5. *Covering Letter:* As email with submitted articles. If the manuscript has been submitted to another journal, this should be stated clearly.
- 6. *Photo of Contributor:* Contributors may enclose a passporttype photograph and a brief biographical statement as part of their article.
- 7. *References:* References should follow the conventional author-date format:
  - Abbott, B. K. (1980) *The Historical and Geographical Development of Muswellbrook* Newcastle: Hunter Valley Press.
  - Harrison, T. L. (1973a) *Railway to Jugiong* Adelaide: The Rosebud Press. *(2nd Ed.)*

Harrison, T. L. (1973b) The Spatial Distribution of Macadamia Plantations on the Far North Coast of New South Wales, *Journal of Rural and Agricultural Problems,* 13, 4, Oct. pp. 347–359.

- O'Donovan, M. J., *et. al.* (1980) "Animal life in the North Star District of New South Wales". In W.W. Murphy, (Ed.) *Readings in Regional Geography (Vol.* 2), Sydney: Williams and Sons.
- 8. *Spelling* should follow the Macquarie Dictionary, and Australian place names should follow the Geographical Place Names Board for the appropriate state.

