

Tin Mining on the Jos Plateau

Natasha Cooper – School not available

Grade Level (Req.): 7th-10th grade	Content Area (Req.): World Geography, Human Geography, Physical Geography, English/Reading	Unit (Opt.):
Connections to Other Disciplines (Opt.): • • •		
Time Frame (Req.): Approximately 1-3 days	Goal (Req.): To gain understanding of an important industry in a foreign land.	
	Objective (Req.): Students will understand the history of tin mining on the Jos Plateau. Students will be able to apply information and brainstorm as they construct a poster on the positive and negative consequences of tin mining.	
Materials Needed (Req.): • Background information • Paper • Straws • Play dough or silly putty • Shoebox • Small necklace box • Spoons	New Vocabulary (Opt.): • • • • •	
Anticipatory Set/Introduction [Inquiry Question is required] (Req.): What are the major events and reasons that changed mining on the Jos Plateau? What are the positive and negative consequences of tin mining on the Jos Plateau?		
Instructional Sequence/Procedure (Req.): <ol style="list-style-type: none"> 1. Students will read background information in groups and discuss the major aspects of tin mining on the Jos Plateau. 2. Students will then write and construct posters displaying the positive and negative aspects of tin mining. 3. Students will then create a display or model after understanding the process of formal tin mining. Each group will be given a ball of play dough, two spoons, two straws, a shoebox, and a small necklace box. 4. Students will then create a model. The play dough represents the soil. The first spoon represents the drag line and students should use the spoon displaying how the top soil is removed. This will create a ditch. 5. The first straw represents the hose that blasts the top soil down to the bottom of the hole. 6. The second straw is used as the suction pipe to pump the slurry into the sluice box. The small necklace represents the sluice box. 7. The last spoon represents the workers digging up the sand, tin, and water mixture. 8. The teacher will have each group explain the formal tin mining process through their models. 9. 		

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Formative Evaluation (Req.): Class participation

Assessment (Req.): Rubric for grading the poster of positive and negative consequences of tin mining on the Jos Plateau: 3 – Excellent brainstorming and creative way of displaying the positive and negative consequences of tin mining; 2 – Good, but need to list and explain more in depth the positive and negative consequences of tin mining on the Jos Plateau; 1 – Poor, did not brainstorm or contribute to the poster of positive and negative consequences of tin mining on the Jos Plateau. Rubric for grading the Tin Mining Model: 3 – Clear understanding of the formal tin mining process used on the Jos Plateau, Good team effort; 2 – Good, but difficult time applying the tin mining process to the created model; 1 – Poor, not a good understanding of tin mining or applying it through the constructed model.

Iowa Core Curriculum Standards Used (Req.):

- Geography, grade 9-12: Understand how human factors and the distribution of resources affect the development of society and the movement of populations.
- Geography, grade 9-12: Understand how human actions modify the environment and how the environment affects humans.
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Common Core Curriculum Standards Used (Opt.):

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NGS Standards Used (Req.):

- How human actions modify the physical environment
- The changes that occur in the meaning, use, distribution, and importance of resources
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Five Themes of Geography Used (Req.): <ul style="list-style-type: none">• Place• Human-Environmental Interaction• Region••	School District Standards and Benchmarks (Opt.): <ul style="list-style-type: none">•••
21 st Century Universal Constructs (Opt.): Collaboration, Creativity	
Other Disciplinary Standards (Opt.): <ul style="list-style-type: none">•••••	
Other Essential Information (Opt.):	
Other Resources (Opt.): <ul style="list-style-type: none">••••	

Tin Mining on the Jos Plateau

Background Information

Tin mining was discovered around 1700-1750 in Kuza near the river channel. During this time of subsistence agriculture, the people needed more advanced tools besides their hands and sticks. The farmers saw tin minerals and crystals near the river. They realized by mixing tin and iron, they could have stronger agricultural instruments. The people believed the discovery of tin was a gift of god.

Tin mining began to develop in local villages and trade occurred with those who came from Tripoli and crossed the Sahara. The tin would be melted and made into rods. By 1760-1770, there were thirteen indigenous blacksmith smelters in Naraguta. This city is located just north of Jos. The Beron ethnic group were finding and producing tin along the Delimi River for the ethnic Hausa traders.

Tin became popular during the industrial revolution in Europe. Tin traced from Tripoli came to the Bauchi Plateau, 200 miles from Jos. The Hausa traders did not want people to know the original source of tin so that is why they put the buying center in Bauchi.

In 1808, Clepparton from Britain traveled three months across the trans Sahara to find smelters in Naraguta. By 1820, Colonel Lewis from Britain was ordered to sample production. At that time, it was not known what tin was being used for. Spain was using the tin for gun barrels. Tin sources in Europe were beginning to fade.

Cowry shells were used to purchase tin. The whiter the cowry, the greater the value. Colonel Laws from Britain found out that tin was located in the rivers on the Jos Plateau. In 1890, Nichols, a retired military officer, wanted to buy tin in large quantities. He also discovered that tin was widespread.

In 1848, the Royal Niger Company was established. By 1902, British spectators obtained licenses from Britain. By 1908, the British bought land for money and the leaders of the community would sell. This was occurring during WWI as the need for tin increased for the use of ammunition.

From 1912-1918, the British wanted to hire the Berons because they were cheap labor. Because they were an agrarian society, they were not interested. The British also decided to ban local smelting and it was given to the Royal Niger Company. The British began to introduce currency and shovels. The tin would be dug up and carried. Tin was also discovered in the hills as well as the rivers. The ethnic Hausas were hired as the supervisors while the ethnic Yoruba and Igbo were brought in because they were sufficient workers.

By 1913, the one hundred eight mining companies had to go through the Royal Niger Company. A railway was discovered from Zaria to Lagos for the export of tin. By 1943, tin mining on the Jos Plateau was at its peak. There were 80,000 African workers. Up to 1960, Jos was the sixth

largest producer of tin in the world. Two hundred twenty-five kilometers of land was taken out by tin mining. This is only 4% of the plateau, which is in the valleys.

Tin mining began to decrease because of substitutions and therefore prices declined. Plastics and other materials that will not corrode replaced the use of tin in cans. Today, tin is used for the coating in surgical instruments, airplane parts, and coating on metal objects. Tin is also used in jet engines because of its high resistance to heat. Kaolin is a type of clay found in tin that is used in chalk and glass.

Malaysia, Bolivia, and Brazil are other countries that produce tin. Tin found on the Jos Plateau is supposedly much stronger. Informal mining is popular and then the tin from the Jos Plateau is often smuggled to these countries to strengthen their tin.

Within the Nigerian constitution, it is stated that all exploitable minerals are property of the government. Companies have to obtain a lease to get the tin material and then there is an argument over the tin assets. Many people cannot afford a lease or to pay the government in order to mine formally so informal (illegal) mining occurs and smuggling occurs. Those who are able to buy a lease and mine formally, often lie to the government of the amount of tin found to make larger profits. Because tin mining has declined, many of the reclaimed sites are being made into resorts and fish ponds.

The Process of Tin Mining on the Jos Plateau

#1 The first process is to stick a pipe with a drill to drill down and locate the tin.

#2 Next, a machine is used that resembles a crane and this is called the drag line as it lifts the top soil off.

#3 A monitor or big hose then blasts the area where the top soil has been removed and where the tin is located. The soil is then mixed with water to form slurry.

#4 A pipe in the bottom sucks the slurry to the top of the hill and pumps it into a sluice box.

#5 In the sluice box, men dig up the sand, water, and tin mixture to help separate the tin. The second group of men hold their shovels in the water to let the water and sand pass by. Because the tin is heavier, the water and sand pass through the tin. The water is turned off and tin is remaining in the bottom of the sluice box.

TIN MINING



Formal Tin Mining



The machine that resembles a crane is used to remove the top soil.



Soil is mixed with water to form slurry.



The soil and water is piped up the hill.



The slurry is pumped into a sluice box.



Slurry entering the sluice box.



Men stand in the sluice box to mix up the water, soil, and tin. This process separates the tin.



Tin is heavier and falls to the bottom of the sluice box while the soil and sand pass through. The water is turned off and the tin is removed from the bottom of the box.



Informal tin mining
These workers earn about \$5.40 per day.



Informal tin mining taking place in the area that the formal tin mining has ceased.



Informal tin mining can be done by a woman.



Land that was previously mined.



Land eroding because of previous mining.



Land previously mined.



Fish Farms



Ponds to raise fish have been built in previously mined areas.



Raising fish for the ponds.



Eucalyptus trees were planted in previously mined areas. Local people have chopped the trees for firewood, but they have grown back. That is what has given them such a strange shape.



Heipang gullies were built by the government to stop erosion caused from abandoned tin mining sites.



Heipang gullies provide drainage into previously mined areas.



The edge of a previously mined area.



The government planted Eucalyptus trees along the edge to prevent further erosion. They found out that the root system actually caused further erosion.