

Fabrication of Chukudu Bike

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Abstract: This paper addresses a Chukudu Bike which is fabricated with very simple mechanisms at very low cost. In Goma, where chukudus form the "backbone of the local transportation system", chukudus are made of hard Mumba wood and eucalyptus wood, with scrap tires for wheel treads. These chukudus take one to three days to build, and last two to three years. The most commonly used size is about six- and one-half feet long, and carries a load of 1000 lbs. However, "the largest chukudus can carry up to 800 kilograms of weight." A small chukudu can be built in about three hours, using dimensional lumber and materials available in a hardware store. The chukudu is customizable to carry different types of cargo. To haul firewood some chukudus have a hole drilled in the middle of the sitting deck and insert a stick to hold firewood in place. Others have a large basket to carry various loads.

Keywords: Chukudu Bike, Public Transportation

I. INTRODUCTION

The chukudu is unique to Eastern Congo. It is a crossover between a wheelbarrow and a bicycle only found here; its robustness and practical simplicity make it the means of transport of choice for charcoal, bananas, construction materials, and other heavy things. The chukudu stands symbol for human creativity under conditions of extreme suffering, I want to propose that it can tell much more about Congo's predicament and the role of technological infrastructure, or rather the disintegration thereof, than contemporary studies of state failure allow for. The discursively expressed unwillingness of the Zairois state to provide for its citizens in even the most basic services still haunts the specter through which donors and the humanitarian community understand Congo's contemporary predicament: its state failure is a social ill, to be remediated through programs targeting 'governance'. In their search to hold human actors accountable for conflict and underdevelopment in situations such as in Congo, studies of state failure have overlooked the importance of infrastructure.

In Goma, eastern Congo, wooden scooters are the backbone of the local transportation system. The Congolese ride and push the hand-hewn scooters across hills, hauling towering loads of charcoal, bananas, potatoes and other products and produce. The chukudus are a reflection of the nature of Congolese life and culture. The local residents of Goma estimate that the chukudus date back to the 1970s, when Congo's economy and government began to buckle under the rule of Mobutu Sese Seko, and people had to improvise on public services such as education and transport. Chukudus are as much a source of local pride as they are a part of the local economy. Formal jobs are rare here, and crafting chukudus is a skilled and prestigious occupation. The scooters are an expression of self-reliance, a sophisticated solution to the small-scale farmer's needs.

Today, the chukudus are essential to transportation in Goma, and crafting chukudu's is a skilled and respected vocation. The craftsmen use machetes and do-it-yourself chisels to turn wood into a mode of transport and the wheels are wrapped in tread cut from old tires. Chukudus, the large, wooden, two-wheeled scooters with handlebars and an angled frame, are favored here for carrying heavy loads. A small chukudu can hold hundreds of pounds. When the chukudu is empty, a driver rests one knee on the base and pushes the vehicle along with the other foot. When full, the driver stands behind the load, using one foot against the back tire as a brake.

II. LITERATURE SURVEY

Robyn Dixon [1], states that it's an ungainly beast of a machine: a wooden bicycle with handlebars like great bull's horns, two runtish wooden wheels, a chunky frame like a squashed triangle and no pedals. There's no seat either, just a kneepad fixed to the frame, made from a spongy Chinese flip-flop.

Moore [2], State that if inelegant, the scooters pound rural roads covered with brittle rocks of solidified lava, left after a 2002 volcanic eruption. No one knows when chukudus were invented, but everyone here agrees

they appeared after independence from Belgium in 1960. By then, bicycles and motorcycles had reached Congo, and chukudu makers tried to replicate their functionality.

Alex Halperin [3], states that Chukudus are as much a source of local pride as they are a part of the local economy. Formal jobs are rare here, and crafting chukudus is a skilled and prestigious occupation.

Ley Uwera [4], states that According to the Association de Chukudeurs de Goma, more than 1,300 chukudus are registered to circulate in Goma. They play a key role in boosting the region's perilous economy. Even young boys can transport hundreds of pounds at a time to earn money. Plus, their sturdy structure works well on Goma's roads, which are covered with hardened lava from the eruptions of nearby volcanoes.

Doug [5], states that in western Rwanda, just 60 kilometers away, sits the Kiziba refugee camp, where 18,000 Congolese waits hoping for peace so they can return to their homeland. Food and firewood rations are provided monthly by the United Nations, and the responsibility for moving these loads typically falls to young boys equipped with a handcrafted, all-wood scooter called a chukudu (choo-KOO-doo).

Kuhmo [6], state that Despite how low-tech and crude the appearance of the chukudu may be to an outsider, the chukudus are an interesting part of life and culture in Congo and are a source of pride in Goma as they are a part of the local economy. In 2009, President Josph Kabila had a monument of the chukudu erected in the center of Goma. The statue symbolizes the hard work of the people in the area

III. OBJECTIVES AND METHODOLOGY

3.1 Objectives

The main objectives of Chukudu Bike are as follows:

The material not only looks extremely unusual, but is also exciting from a mechanical point of view. Wood is a fibrous material, very similar to carbon, but in contrast organically grown and sustainable. Wood springs and is still stiff. With the right workmanship, it is absolutely suitable for everyday use in any weather. In short: Wood is very suitable for a bicycle frame.

Harmful Chemicals Are Reduced

We usually think of gas as the only pollutant when it comes to cars, but they also use antifreeze and other fluids that are bad for the environment. Using wooden bike instead of driving cuts down on all of them.

More Wooden Bikes Equals Fewer Roads

More cars mean more roads need to be built, which causes water run-off that contributes to ground and water pollution. More wooden bikes mean more bike paths and lanes which are more sustainable.

Noise Is Also Pollution

We rarely think of noise pollution when it comes to cars, that is unless you live by a busy street. Swapping bike rides for drives will make your neighborhood quieter to everyone's benefit.

3.2 Methodology

'Chukudu' the engineless wooden bike is used in Goma, the capital of North Kivu province in the eastern Democratic Republic of the Congo. Chukudus are used for transporting cargo and they can carry hundreds of kilograms at a time. Chukudu plays an important role in the economy of Goma. Even young boys earn by transporting goods. The sturdy structure of the vehicle is apt for the lava-covered roads of Goma.

This engineless bike has an angular frame, a long plank (board) with two small wheels at both ends, handlebars, all made of wood. Sometimes the wheels are wrapped in tread cut from old tires. It usually has a pad on the board. The rider keeps one knee on this pad while propelling the vehicle with the other leg. Though this vehicle is odd-looking it can go very fast even with a heavy load.

Though the Chukudu might look like a toy bike to outsiders, they are the "backbone of the local transportation system." Chukudus are used to carry all types of cargo like firewood, charcoal, cement, farm produce, etc. The load is balanced on the plank. The driver rides and pushes chukudu to transport the cargo.

IV. WORKING PRINCIPLE

The chukudu is a two-wheeled handmade vehicle used in the east of the Democratic Republic of Congo. It is made of wood, and is used for transporting cargo.

The chukudu generally has an angular frame, two small wheels often of wood, sometimes wrapped with rubber, handlebars, and a pad for the operator to place their knee on while propelling the vehicle with their leg. On a descent, the rider stands on the deck like a kick scooter. On flat ground, the rider can put one knee on the deck and push the ground by the other foot like a knee scooter.

Chukudu moves by momentum. If the chukudu is empty and is on flat ground, the rider puts one knee on the board and pushes the ground with the other leg propelling the vehicle, like in skateboards. If the chukudu rider is riding down a slope, he stands on the board keeping one foot against the rear tire to act as a brake as there is no brake in the vehicle. Sometimes the driver uses his foot as a brake.

Chukudus are used to carry all types of cargo like firewood, charcoal, cement, farm produce, etc. The load is balanced on the plank. The driver rides and pushes chukudu to transport the cargo. The following components used to construct chukudu bike are:

- Deck
- Fork
- Steering Shaft Support
- Handlebars
- Brake
- Wheels
- Suspension

V. FIGURES



Fig. 1 Deck of Chukudu



Fig. 2 Wheel



Fig.3 Steering Shaft Support

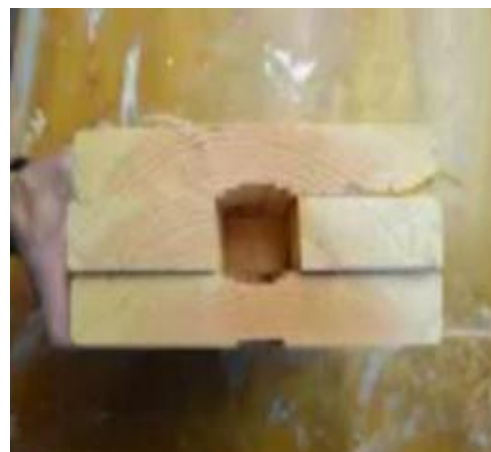


Fig. 4 Fork



Fig. 5 Completed Project Model

VI. CONCLUSION AND FUTURE SCOPE OF WORK

6.1 Conclusion

Despite how low-tech and crude the appearance of the chukudu may be to an outsider, the chukudus are an interesting part of life and culture in Congo and are a source of pride in Goma as they are a part of the local economy. In 2009, President Josph Kabila had a monument of the chukudu erected in the center of Goma. The statue symbolizes the hard work of the people in the area. The vehicle is also customizable for different types of cargo. To haul firewood, the makers drill a hole in the middle of the sitting deck and insert a stick to hold the firewood in place. Other chukudus are fitted large baskets for various loads. The low-tech scooters are a steady and fast alternative to wheel barrowing crops and goods around the city and across farms. With no engine, the bike moves by momentum. The riders have to push down and away from the ground, similar to the way skateboarders generate movement. Building a wooden bike is difficult to make at first, but it's durable enough to last for up to 3 years. Available in three models small, medium and large the chukudu is a marvel of practical engineering and endurance. It has become the donkey of eastern Congo. Wood has unique characteristics that specifically impact the cycling experience, its shock absorbing and vibration dampening. Since wood is 10x less dense than steel, wooden bikes are able to be thicker than steel, without compromising on weight. And a thicker wooden frame means an increased ability to absorb more energy from the road, making your ride smoother.

6.2 Future Scope of Work

Riding a chukudu bike is not only a great way to improve your physical and mental health, but also the health of the planet. By not using any gas, chukudu don't release harmful emissions that pollute the atmosphere, nor any carbon dioxide that contributes to climate change. Just moderate increases in chukudu use each year could save an estimated 6 to 14 million tons of CO₂. They can be made from a variety of different woods, depending on the manufacturer. In recent years, however, there has been a resurgence of interest in wooden bikes for all ages. They are now becoming more popular than ever before.

Chukudu bikes have many advantages over traditional metal bikes. They are more durable, eco-friendly, and stylish. Wood absorbs more vibration than any other type of bike frame. In fact, it absorbs four times as much as carbon frames. As long as wood is correctly sealed, it won't be affected by temperature changes or wet conditions. Chukudu bicycles are also low maintenance. Chukudu bicycles are eco-friendly if made from sustainable wood.

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