

# POWER TILLER IN BAUCHI STATE INTRODUCTION<sup>1</sup>

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## Abstract

*Two-wheel tractors have been very successful in mechanization of tillage and other operations in many countries across Asia. Sri Lanka with 120,000 and Bangladesh with over 300,000 have mechanized tillage of over 80% of their total cropping areas with two-wheel tractors. Thailand's two-wheel tractors approaches 2 million. Statistics are scarce for China, one of the major suppliers of two-wheel tractors but estimates are perhaps over 10 million in use there. Though most farmers and entrepreneurs buy two-wheel tractors for tillage and tillage service provision on theirs' and their neighbors farms, they have equally important roles as stationary power sources for equipment like threshers and water pumps and also as rural transporters with a 1.5 ton capacity trailer. In Africa there have been literally hundreds of attempts by governments and donors to introduce two-wheel tractors into sub-Sahara Africa with little success. The following describes a recent attempt to introduce Chinese two-wheel tractors by the Bauchi State Government with support from Sasakawa Global 2000. Though the initial results are promising the authors are concerned that lack of follow up and support jeopardizes one the first real instances of success with two-wheel tractors anywhere on the continent.*

## Overview

Bauchi State is comprised of 20 Local Government Areas, and a population of 3.4 million people and 332,000 farming families. Extension agent - farm families' ratio is 1:1100 and over 70% of the working population has farming as their main occupation. The total land area is 484,000 sq/km, of which 85% is cultivable, but only 1,200 sq/km (25%) is actually under cultivation. Livestock stock farming is practiced all over the state. The major crops cultivated are sorghum, millet, maize, rice, cowpea, and groundnut in the wet season and tomatoes, peppers, onion, and sugarcane in the dry season. The average land holding per farming family has increased from 2 hectares to 3 hectares from 1993 – 2003.

Bauchi State has three agro ecological zones: Northern Guinea Savannah in the West and the Central Zones; The Sudan Savannah in the Central and Northern zones; and the Sahel, in the Central and Northern zones and the Sahel, in the Northern Zone.

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## ***Mechanization Observations***

There is a commonly held perception among agricultural development professionals that there has been a large reduction in efforts to bring mechanization processes to Nigerian small holders. Even the promotion and use of hand tools has waned. Additionally, the preceding decades efforts for agricultural mechanization have been decades of promotion of large scale agricultural mechanization through large tractors in the private sectors as well as the various state government's tractor rental services. It is acknowledged that there has been lack of appropriate, simple and affordable technologies available for the farmers. Currently most of the improved farm machinery is clustered around the peri-urban areas where marketing firms are located. This continues to keep rural farming labor intensive, increasing turnaround times that leads to late planting, lower yields and post harvest losses.

A few of the problems associated with the farmers in Bauchi State are::

- Small farm size
- Low income earning
- Increasing soil degradation and soil erosion
- Increasing costs of farm inputs
- High cost of large farm machinery / little access to credit facilities
- Little or no access to more simple and affordable machinery and equipment.

This necessitated the present government in finding ways and means of addressing the farmers' problem in sourcing, introducing, and promoting simple and affordable farm power/ machinery and equipments and resulted in the importation and introduction of Chinese made two-wheel tractor and accessories. In 2002 Bauchi State imported 500 sets of 2WTs, reduced till/zero till seeders, trailers. In 2003 they sold 100 sets to the Gusau State Government.

## **Problems Associated with Marketing Two-Wheel Tractors In Bauchi State**

After the tractors arrived the Chinese factory engineers arrived to provide training in operations and repair of the equipment. Despite the good intentions the trainings failed to

adequately train engineers and operators perhaps due to language barriers. And more importantly, in hindsight, they failed to show how the tractors and machinery could be used commercially for providing tillage and agro services for the entrepreneurial business models. This led to the early adopters or buyers of the 2WT experiencing many problems in handling and maintenance such as:

- Breakdown of the 2WT and implement e.g rotary disc blades, shaft bearings, chain casing, clutch system, etc.
- High rate of accidents during field and transport operations
- Initial non-availability of essential /basic spare parts.

The problems listed above, resulted in lost of confidence of the 2WT technology by the farmers. It was even nicknamed ‘visa to hospital bed’ or ‘small and dangerous machine’ by the local communities.

As a result, for the period of 4 years only 10% of the PT were sold. Even those that owned them were afraid to put them into use or into operation for fear of having accidents.

## **Technical Committee Established**

Due to low sales and problems experienced as mentioned above, the Bauchi State Government set up two separate technical committees to identify the reasons for low adoption and recommend ways to dispose of the hundreds of remaining 2WTs. The 2WT technical committees in December 2004 with the following mandates.

- A. **Mandate of the first committee** is to identify reasons for the low patronage of the PT
- B. **Mandate of the second committee** is to find ways and means of disposing of the PT.

The author was nominated and participated in both committees.

- A. **FIRST COMMITTEE FINDINGS** (reasons for the low patronage of the PT)
  - i. **Lack of users information’s:** For the period of 4 years there was no efforts to sensitized the pubic on the economic benefit in using the PT in rural mechanisation and rural transportation, especially its importance to small scale farmers.

- ii. **Training:** There were no trainings organized or conducted on basic operation and maintenance for agricultural engineers, extension technicians and the end operators. i.e buyers/service providers<sup>5</sup>.
- iii. **High cost of PT:** Added to the low capacity or knowledge levels of the average farmer in the state, coupled with the non-sensitization on the PT economic benefit, the average farmer perceived that the small farm machinery was very expensive.

## **RECOMMENDATIONS**

### **A. FIRST COMMITTEE'S RECOMMENDATIONS (LOW PATRONAGE)**

The committee gave the following recommendations to Bauchi State Government:

- 1. Need for an urgent programme on sensitizing of the farmers.
- 2. Need to organize a training programme to selected Agricultural Engineers, Technicians (extensionists) and Operators on basic operation and maintenance procedure and to be conducted in China
- 3. Subsidy. Due to the above mistakes that caused loss of farmers interest for the PT, it was recommended to subsidize the cost of the PT, as a way of luring back acceptance by the farmers.

### **B. SECOND COMMITTEE'S RECOMMENDATIONS (DISPOSAL)**

The committee came up with following recommendation and guidelines to effect quick and successful disposal.

- i. The PT be given out to interested civil servants, that are into farming or those that are willing to go into farming on loan to be deducted form their monthly salary for a period of 24 months.
- ii. Certain percentage of the PTs to be allocated to farmers group and associations, also on loan basis, but to be guaranteed by their Apex Association and Farmers Cooperative Agency.
- iii. 40% down payment would be necessary by the above individuals and groups to qualify for the loans.

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<sup>5</sup> This is also the case of what happened in Zamfara State.

- iv. An additional 30% subsidy was recommended to the government from the initial 35% discount, that making 65% total subsidy/discount<sup>6</sup>.
- v. Allow all other individuals to purchase on cash and carry basis

## **Turning Point**

Despite the above recommendations little happened in the way of disposal until skills and knowledge were acquired in a large and lengthy training workshop that was organized by Zamfara State Government in conjunction with Sasakawa Global 2000 (SG2000) in January of 2006<sup>7</sup>. This training was the turning point which really helped in changing the farmers and government agricultural engineers and operators first poor impressions of the 2WTs and corresponding lack of interest in the technologies. To change these initial bad impressions of the technology took more than just technical training sessions. Perhaps the most important sessions were the conducting simple sensitization exercises and presentations on the economic benefits of the 2WTs. Detailed outlines of how farmers/service providers in south Asia have used this PT and its accessories in creating successful “micro enterprises” and who now provide a wide range of services to their surrounding communities. Lengthy and wide ranging discussions and debates with the farmer and engineers and operators as to whether the lessons taken from south Asia could be applied in Nigeria, there wasn't one farmer who , who thought that the PTs would not be successful.

After the Zamfara Training Workshop the additional following actions were taken:

1. Organising small group training approach programme on basic operation and maintenance
2. Conducting small group approach with multiple tractors and accessories in field demonstration by inviting small farmers group /fabricators.
3. Identifying young able men due to their courageous in nature than the elderly men to be operators of the PT.
4. Identify and demonstrate the use of the rice seed drill machine in planting maize seed.

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<sup>6</sup> Another reason for such a high subsidy was that during the 4 years of storage the tractors' and implements' condition deteriorated (weathered) to the point that the PTs appeared to be “second hand”.

<sup>7</sup> The trainer, Mr. Scott Justice, was brought from Kathmandu Nepal where he has worked with several international projects in popularizing this Chinese PT and it's attachments since 1996.

5. Contact the local fabricators in locally fabricating some parts of the implement, e.g . trailer body.
6. Developing direct and indirect ways of information dissemination.

Additionally, my participation in the two committees set up by the Government coupled with my contribution in arriving in these recommendation have greatly made the training programme that I attended in Zamfara State on the PT very useful and fruitful

## **THE SUCCESS STORY**

To date all the following impacts have occurred:

1. All the Chinese PTs and its accessories in stock in Bauchi Agricultural Supply Company have been exhausted (for details see table on Page 11) .
2. All the farmers that we recommended to go for the PT have expressed their happiness and delight with their new technology.
3. By successfully introducing the PT rice/wheat seed drill to planting of maize seed, it has addressed one of the biggest problems earlier identified by SG 2000, that of labour drudgery experienced by the local farmers. This has been of immense benefit to the farmers adopting this technology.
4. Bauchi Agricultural Supply Company and we Engineers are witnessing a large increase of inquiry and requests for PTs by farmers
5. Due to this increased demand, local farmers are now offering to pay up to ₦30,000 – ₦40,000 higher than the present subsidized selling cost.
6. Development of non-agricultural uses of the PT especially rural transportation, i.e. haulage of farm produce sand, block, water etc is greatly increasing.

## **COMMENTS / SUGGESTIONS / OBSERVATIONS**

**Comment:** Considering the volume/cost of the earlier trade transaction between the Bauchi State movement and Changzhou Dongfeng Agricultural Machinery Group Co., the manufacturer of the PTs, there was little or no effort for provision for training programmes. It was thanks to the training conducted by Zamfara State Government and SG 2000, that has contributed greatly to the success story on sales and adoption of the PT in Bauchi State.

## **Suggestions:**

- i. I am therefore suggesting that upon any new order of Chinese PTs that Bauchi State negotiate with the manufacturer / exporter (Changzhou Dongfeng Agricultural Machinery Group Co. or any others) an organized training /visit programme for select Engineers, Technicians and operators in China, especially to see first hand how the farmers there used this technology so successfully for so many years and to aid in the replication this mechanisation process here in Nigeria.
- ii. There is a very urgent need to conduct an “initial” impact assessment of the PT operation in Bauchi State, the outcome of the result will enable future modification and development of the product for market acceptability.
- iii. Provision of other equipments and accessories e.g thresher’s, irrigation water pumps, sprayers, seeders/planters, bed formers etc., matched to the PT/engine will complement very nicely a wider range of utilization of the PTs and bring even more “appropriate technology” mechanisation benefits to Nigerian farmers.

## **Observations:**

- i. Due to my regular traveling, I have observed some PTs from South Korea PT are also now penetrating the Nigeria market.
- ii. If the PT is fully accepted in Bauchi State, there is every possibility that farmers of the neighboring states of Bauchi State will also show interest. Bauchi State should have an “outreach” program to help the farmers in neighboring states so that these benefits are spread as far as possible to all Nigerian farmers.
- iii. Some of the PT in Bauchi states have penetrated the neighboring states even though in smaller number. I came across some buyers coming to Bauchi for spare parts and offered them advisory services. And they show keen interest to come for training whenever it is going to be conducted in Bauchi.
- iv. Due to recent electricity failure experienced in recent times some owners of the PT are now using the engine to generate electricity in their homes.

## **CONCLUSION**

1. In conclusion, the subsidy whether high or low should not be a yardstick in disposing of the PT. The main important aspect is, if it can serve the farmers purpose. Initially with very large subsidy the farmers were not interested, but by seeing the new development, they are even offering higher price above the subsidized cost. It could be that in the future with more private sector involvement that there will be no need of subsidy.
2. The buyers are using the PTs for their farm operation e.g land tillage and planting. Further more they are also using them now for rural transportation and haulage.
3. For now the Bauchi State has no immediate plan, rather it is watching and monitoring the performance of the PTs by collecting and collating farmers reactions. In fact the reaction so far is very positive and encouraging
4. To be frank the success story of the PT really took us all by surprise. Despite the Zamfara/SG200 training we remained somewhat pessimistic, for that, we didn't draw up a performance data or any follow on programs. However, with this success, I have started developing performance data in preparation for the next farming operation. This should include comparisons of yields, cost, savings (time, money, and energy/diesel) between current farmer practices and the new PT practices and the impacts of poverty alleviation.

Secondly, conducting programmes for impact assessment is capital intensive, so we need to source assistance from donor organizations.



<b>S/NO</b>	<b>Tractor/Implement Description</b>	<b>Quantity ordered</b>	<b>Initial Price</b>	<b>Current price</b>	<b>Remarks</b>
1	Power Tiller with complete Accessories	-	350,00.00	Credit – N157,500 Cash – N136,600	100% disposed
2	Power Tiller	500	128,683.00	Credit – N57,908.00 Cash – N50, 187:00	100% disposed
3	Anti-Skid Wheel	500 Pairs	6,139.00	Credit – N2,763:00 Cash – N2,394.00	100% disposed
4	Disc Plough	500	33,638	Credit – N15,138.00 Cash – N13,119.00	100% disposed
5	Double furrow	500	8,975.00	Credit – N4,039.00 Cash – N3,500.00	100% disposed
6	Trailer	100	87,428	Credit – N39,343.00 Cash – N34,100.00	100% disposed
7	Reaper	100	39,851.00	Credit – N17,950.00 Cash – N15,542.00	100% disposed
8	Seed Drill	100	45,558.00	Credit – N20,501.00 Cash – N17,768.00	100% disposed