

**MINUTES OF THE MAIN STAKEHOLDERS MEETING ON IMPROVEMENT
OF THE AFRI-HANDCART HELD ON 9TH MAY 2006 IN THE MRTTP
CONFERENCE ROOM FROM
14.00 HOURS.**

[COMMENTS by Arnold Wendroff, PhD May 13, 2006]

Members Present:

Name	Organisation
1. Mr. J.G. Chagunda	MRTTP (Chair)
2. Mr. K. Chisale	Ministry of Industry, Science and Technology
3. Dr. I. Ngoma	The Polytechnic/T2 Centre
4. Mr. S.M.C. Chirambo	MRTTP

Apologies

5. Mr. W. Kumwenda	
6. Dr. E. Vitsitsi	Bunda College of Agriculture
7. Mr. C. Guta,	MIRTDC
8. Mr. H. Kazembe	Chitedze Research Institute

1.0 Welcome Remarks:

The Chair opened the meeting by welcoming all the members and asked them to introduce themselves. He stated that the purpose of the meeting was to discuss ways of improving the Afri-cart in line with the propagation, which Dr Arnold Wendroff had been carrying out for the cart. And as Malawian main stakeholders, it was important to meet and agree the way forward on how the technology could be improved and promoted.

2.0 Background of the Afri-Cart

The Chairman presented a brief background of the Afri-Cart and some technical drawings which were produced by Dr. Wendroff. It was stated that the Afri-cart which was initially known as Malawi Cart was produced in 2000 by Dr. Wendroff to meet the need of alleviating back and head loading which was quite rampant in rural areas. Therefore, the idea was to come up with a cheap, durable, local design handcart that could be adopted by the local people. The drawings of different proto-types of the cart were shown to the members.

The Chairman also stated that his programme, which is responsible for Rural Transport interventions through district assemblies, had tested 16 handcarts in 2002/2003 period and a report was circulated which indicated the results of the tests.

Thereafter, the meeting discussed the following issues based on the background information.

3.0 Afri-cart Performance Evaluation

After the background, the meeting was interested to know what had been the approach of promotion and the performance of the carts which were made so far.

It was reported that apart from the report from MRTTP on the 16 Afri-carts which were distributed, there has not been a central point for that consolidating performance results of the carts. It was pointed out that after six (6) months (they were distributed in June 2002) of using the carts the results which were extracted from a report where bicycles were also distributed, was as follows:

'In general, the handcart gave more problems than the bicycle due to the strength of the wheels as shown in the table below. The rim of the wheel easily flattened if the handcart was overloaded. [a) The bicycle wheels used in the 16 AfriCarts the MRTTP trials used the thinner 14 gauge spokes, instead of the far stronger 12 gauge spokes. b) The AfriCart's bicycle wheels were designed for radial loading, and not for any substantial axial loading. The users of the AfriCart were evidently not adequately trained/educated in the use of their handcarts. If the AfriCart is handled properly, the wheels will easily handle loads of ~100 kilograms for long periods of time with minimal maintenance. In Malawi we frequently see even large trucks broken down due to overloading. Does this imply that the trucks in use in Malawi are poorly designed or manufactured? No, as the same models of trucks are almost never seen to breakdown in developed countries due to overloading, as better operator training and police enforcement of load limits minimizes the overloading risks. If the AfriCarts are used within the limits of their design, they will give good service.] By the end of February 2003 the status of IMTs were as follows:'

Status of the distributed IMTs

	Bicycles	Percentages	Handcarts	Percentage
In use	14	88%	7	44%
Broken down	2	12%	6	37%
Heavy breakdown	0	0	3	19%
Total	16	100%	16	100%

It was pointed out that some carts were distributed to Lilongwe and Mzuzu City Assemblies for refuse collection. Unfortunately, no formal report was compiled although it was later discovered that after a period of eight months, the carts were not operational. [Once again the failure of the AfriCarts was due to a lack of adequate operator training, and a virtual lack of maintenance. In Mzuzu, once the 12 gauge spokes were fitted, the AfriCarts gave good service for several years.] It was also pointed out that some carts were assembled at Chitedze and were distributed to local farmers but the results were also not consolidated.

It was also pointed out that some handcarts were being kept idle in rural areas due to durability problems compared to a bicycle. It was pointed out that people preferred a bicycle since they could also ride it as well as carry some load. [This is like comparing the proverbial 'apples and oranges.' The very reason we are 'pushing' handcarts is that bicycles are essentially un-suited to the transport tasks of the typical subsistence and smallholder farmstead. Nor are bicycles of any use for collecting municipal refuse. So, what is the point of comparing

'preferences' for bicycles and handcarts? They are two complementary forms of IMT's, as opposed to being competing IMT's. In essence you recognize this difference in the last sentence of this paragraph.] The path for a bicycle is also a single line path compared to a handcart which required a double line path. The meeting agreed that, it would be important to inform people that there are several categories of transport services which could be offered. A bicycle could be categorized as a medium distance mode whilst a handcart could be a short distance mode but was of huge importance to the rural masses for that category of travel.

The meeting also discussed the importance of certification despite that other technologies such as animal-drawn cart were being used without any certification. The members agreed that this was an issue since the promotion of the cart was seeking funding from donors or indeed the government which required that the funds would be invested in worthwhile projects whilst other technologies were market driven. [I should again like to stress that my intent in devising the AfriCart handcart design is that it is 'merely' an interim solution to the need for affordable wheeled transport for the masses of Malawians. It is intended that the AfriCart demonstrate the utility of handcarts in a form that can be readily manufactured by local village carpenters using their own hand tools, wood planks, and bicycle wheels. As the user public becomes aware of the utility of handcarts, it is hoped that the relevant government agencies, NGOs and above all the commercial sector will appreciate the utility of handcart technology, and will work to disseminate conventional handcarts, i.e., those using purpose-build handcart wheels running on a common axle. It is envisioned that the importers and distributors of bicycles and bicycle components will appreciate the enormous market for handcart wheel-axle sets, and will import them from India and China, and make them available throughout Malawi at prices that are competitive with the current bicycle wheels. The Malawi Handcart Project has placed an order for 12 sets of wheels and axles with SinoLink in Limbe, which should be arriving by the end of May, 2006. These wheels are similar to those tested in handcarts by Wells Kumwenda at Chitedze Research Station at the suggestion of then Minister of Agriculture, Aleke Banda in May, 1998. Those tests demonstrated that even an 8-year old girl could move a 50 kilogram load at a rate of one kilometer in 15 minutes, and adults could move a 150 kilogram load one kilometer in 14 minutes. If these wheel-axle sets are available from retail outlets at a reasonable price, they would enable very rugged handcarts to be build at less expense than the AfriCart, yet with greater carrying capacity and requiring less maintenance. There are a wide variety of wheels suitable for this purpose, some, here in the USA, costing as little as US\$ 4 apiece. I am bring several sample sets of these wheels with me to demonstrate to you on my arrival in Lilongwe on June 6, 2006.]

Having discussed that, the meeting enormously agreed that the technology was required but it needed some improvements so that it could be sustainable.

4.0 Afri-cart Areas for Improvement

4.1 Wheels

It was agreed that due to the reports from the Afri-carts assembled so far using both 14 and 2 [12 gauge] gauge spokes, the wheels were still giving some problems. It was agreed that an alternative could be motorcycle wheels which could be fitted to the cart. The availability of old motorcycle wheels was discussed and it was agreed that it would be better to check with various NGOs and Government Departments on how they dispose such time of materials and a decision could be made. The members agreed that the MRTTP Unit would look into that. [It should be clear at this point that, as mentioned above, the AfriCart design was developed to utilize readily **available** and **affordable** components. Motorcycle

wheels, either new or used, are neither readily available nor readily affordable. There is no point in considering them, especially as they, like their bicycle wheel counterparts, require an expensive and heavy frame to affix them to the box body of the cart. If we are to explore alternative wheels to bicycle wheels, let us look to the importation of true handcart wheels, which are far cheaper than even used motorcycle wheels, which are in any event in extremely short supply, and could never satisfy the need for handcarts in Malawi.]

4.2 Body

It was agreed that since the proposed wheels are bigger, the current wood chassis of the cart would not be feasible, hence it was agreed that a metal chassis could be ideal. This could be made out of angle irons so that it would be cheap and easy to fabricate. The meeting agreed that the colleagues in Chitedze Research Institute have to look into that with assistance from the Polytechnic and Bunda College of Agriculture Engineering Department. It was agreed that it would also important to look at the load bearing members so that they are made in steel. [I again wish to remind the reader that the overriding factor restraining handcart uptake is that of cost. It is simply not economically feasible to build a handcart with expensive (and relatively unavailable) motorcycle wheels, and with relatively expensive, and not readily available steel sections, at a price approaching the ~US\$ 50 cost of the AfriCart. Who are our intended customers? I believe that the average subsistence farm family in Malawi deserves to have their own handcart, and that handcarts can be built at a cost that they can afford of the wheels can be obtained at the retail cost of ~US\$ 4 apiece, and the cart body can be built locally by carpenters using wood. There is simply no way that a steel handcart can be built with motorcycle wheels at an affordable price.]

4.3 Braking System

The meeting also pointed out that there would be need of ensuring a braking system for the cart which was not provided for in the initial design. An example was given of the common handcarts which were made by local people which use an old motor vehicle tyre fixed at the bottom as a brake. [Although brakes are a **desirable** feature, they are not a **necessary** feature. If you peruse the catalogue sheets of handcart manufacturers and distributors, as well as photographs of handcarts in use in India and China, you will find that there are fewer than 1% with any form of brakes. For the present, the cost of brakes is far too much of an economic constraint to make them worthwhile to incorporate into a handcart targeted at the poor subsistence farming community, and the poor urban dwellers. Brakes are essentially un-necessary save in hilly terrain, and even there, handcarts with no brakes are routinely used. We need to concentrate on a technology that is serviceable for the majority of users at a cost they can afford, and not on an 'ideal' technology that is not affordable to the masses. "The best is the enemy of the good."]

Having agreed on improvements, the meeting also agreed that the UNIDO Project would be the best outlet for testing the improved carts since they were already working on appropriate technology with rural people. [I agree that the UNIDO project would be an ideal venue for testing the application of handcarts as labour-saving transport technology for Malawians. I would urge that several varieties of handcart wheel-axle sets be acquired, and tested, in addition to some of the AfriCart design. Malawian importers and distributors need to be made aware of these components and encouraged to carry them at affordable prices if any real progress at introducing labour-saving transport technology is to be made. The UNIDO project, if it is to be successful in the transport sector, must work to inform the commercial sector of the

market potential of these handcart wheel-axle sets, so as to make them available in Salima District in the same manner that ox-cart components and bicycles currently are available.] The meeting also agreed that Dr. Wendroff had to be on the circulation list of the emails so that he should appreciate the proposals by the team. In so doing he should understand that the team is looking at improving the cart so that it is still a cheap commodity as well as maintain sustainability by using locally available materials. [These handcarts will never be a “cheap commodity” as long as income levels hover around the <US\$ 200 per capita level as they currently are. They will however be ‘affordable’ commodities just as bicycles currently are to many farm families, if, and only if, the commercial sector is encouraged to source these components at the best possible prices from manufacturers in China and India. There is no reason why this cannot occur, if government and NGOs work together with the entrepreneurial sector. The market is there, but it needs to be demonstrated to the end users, the government agencies, and the business community. If an effort is made in this direction, the economic benefits to all parties concerned will be very great, and your work will be recognized and rewarded.]

The meeting agreed that the initial funding for the improved carts would be sourced within the member’s organization with MIST and MRTTP pledging the support. The Polytechnic also indicated that it could use the College Students as project for testing and improving the components of the cart. [I might add that the testing of the AfriCart and other handcart designs has begun in the Millennium Villages Project at Mwandama near Thondwe/Zomba. ~40 AfriCarts will be built and tested there, along with other handcart designs utilizing conventional wheel-axle sets. It would be well worthwhile to liaise with the MVP personnel working there, to coordinate assessment of this technology. (Rebbie Harawa, PhD 09 341-222 and Ellaton Mkwate of the MHP at 09 951-615 / 01 667-880. Also, the expertise of both the Bunda College department of agricultural engineering (Elisha Vitsitsi, Darwin Singa), and the Farm Machinery Unit of Chitedze Research Station (Hendrex Kazembe) have been working on handcart assessment for some time. Their involvement in this area would be valuable and should be encouraged.]

The involvement of MIRTDC was also agreed as one of the main areas which required to be stressed since their expertise in such technology could not be overemphasized. [I would like to take this opportunity to suggest that there be one single government agency responsible for the **overall coordination** of handcart assessment and dissemination strategies. The several agencies currently engaged in this work need a clearly defined coordinator and clearinghouse for dissemination of information to the several stakeholders. It appears to me as if the MRTTP has assumed this role, but in any event it needs to be agreed upon and we must work together within the mandates of our respective agencies. I can only say that I am delighted that you are giving this technology the consideration that it needs to assist Malawi’s development in a truly meaningful and quantifiable way.]

5.0 Any Other Business:

- a. The involvement of Teveta in the project was agreed that it could be explored since they were working with Technical Colleges on appropriate technology
- b. The Chinese Suppliers of 14gauge [12 gauge. It may be possible to source even thicker spokes? This needs to be investigated. The MHP’s Hastings Mkandawire (09 351-319) is currently purchasing 12 gauge Chinese “K” brand spokes in Mbeya, Tanzania. A somewhat inferior brand if Indian 12 gauge spokes are being imported on an occasional basis by Choonara Highway Emporium in Lilongwe.] spokes were to be

approached to check whether they would source motorcycle wheels as well. This would be done by Dr. Ngoma.

- c. Chitedze Research Institute would be informed of the proposals so that work could commence on the suggested improvements. [Under the direction of Hendrex Kazembe of Chitedze's Farm Machinery Unit, carpenters Patrick Chisi and Joto Kasambala have been building AfriCarts ever since 2002. They should be encouraged in this enterprise.

It is worthy of note that the AGRESS under Dr. Grace Malindi had begun an assessment of the application of handcarts to assist farm families impacted by HIV/AIDS at Chambwe Village. The MHP had donated a number of AfriCarts for this assessment, and had trained a local carpenter, A.G. Kapasala, to build and maintain the AfriCarts. This application is of great importance and should be encouraged. It is also one that has the potential to secure external donor funding if its potential is demonstrated in a quantitative manner. The Ministry of Agriculture would be well advised to pursue this line of research and give it a greater priority than it has had in the past.]

6.0 Closing Remarks:

The Chairman then commended the members for coming and the constructive deliberations that they had made during the meeting which was an indication that the stakeholders were committed to improve the technology to assist the rural people. Special recommendation was made for Dr. Ngoma who had traveled from Blantyre and was returning the same day.

The next meeting was agreed that it would take place on Wednesday 9th August 2006 at the same venue and the meeting was closed at 15.45hrs. [I thank you for your invitation to meet with me in early June, shortly after my arrival in Malawi on June 6th. If we can share our ideas and collective expertise, I believe that we can 'pull this off' and make a real difference in Malawi's development. This work of yours on technology transfer has an enormous potential for attracting funding from external donors. The UNIDO project is an example of this. I suggest that after initial formal assessment of the handcart's potential (not only in the agricultural sector but in urban applications as well), that you work to seek funding for larger-scale testing and dissemination programmes.]

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May 13, 2006]