

Macha Works!

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ABSTRACT

Macha is a small and resource limited village in rural Zambia. Since 2003 remarkable progress is taking shape in Macha. Since that time, the village is connected to Internet via a VSAT satellite connection, integrated with a holistic and respectful vision based upon developing the potential of the local community. Thus the local community plays a major role in the development process.

To operate the communications network a cooperative not-for profit company was set up, Macha Works, with its ICT unit LinkNet, owned by the community.

Overall the Macha approach appears very successful and is now being scaled up to many more villages in Zambia. Macha itself is in a next stage of development. It is evolving into a center of expertise with training, talent development, innovation and experimentation in the fields of agriculture, alternative energy, appropriate types of entrepreneurship, and novel approaches in ICT fitting the African context. A cooperation with the University of Zambia in Lusaka is evolving with education, applied research, and practical work taking place in rural Macha. Hundreds of new employment positions have been created since Macha Works started its activities.

Connecting rural communities in Africa is quite a challenge. Communication and energy infrastructures are lacking. Connectivity through satellite links are extremely expensive. Mobile Internet might be an alternative in the medium term. Introduction of Virtual Network Operations to share costs can support reaching the marginal, rural markets.

The value of the holistic approach driven by connectivity has been recognized and the development in Macha is now supported by organizations and authorities in Zambia, Netherlands, the Global Research Association and European partners. Connectivity appears to be a powerful tool to empower the local community to guide their own development. In addition, two valuable additional effects should be mentioned. First, Internet can help to preserve and share the cultural heritage. Second, communities in rural Africa become part of and thereby enrich the global community.

This paper describes the approach taken, the obstacles encountered (logistics, finance, durability of equipment in harsh conditions, regulation issues etc.), the lessons learned as well as the plans for next steps.

Keywords

Connectivity, rural Africa, ICT, Macha Works Model.

1. INTRODUCTION

Since 2000 persons now associated with Macha have made efforts to engender sustainable progress in rural Africa, first in Zimbabwe, then Zambia. Activities emerged in rural societies full of poverty, sickness, fear, and hopelessness. Implementation of

Internet connectivity appeared to be instrumental for sensitization, exposure, planning and execution of innovations and entrepreneurial activities in local communities [1] [2]. The resulting Macha Works Model proves to greatly enhance the chance of local and sustainable progress, resulting in a vibrant and enterprising society, while preserving the unique African culture [3].

The vision for Macha Works is 'to inspire people in rural areas to reach their collective and individual potential'. It does so through a three step approach within the context of community ownership:

- 1) implementation of Internet connectivity;
- 2) training of local talents;
- 3) community driven solutions.

As to assure long term progress and contextual embedding, values, among which ethics, of activities are prioritized. Macha Works explicit core values, which center around optimism, friendships, embracing of challenges, and a passion for excellence, aim to inspire and edify stakeholders and local talent. Among Core Competences are understanding, mobilizing, acting, and persisting.

Macha Works aims to be instrumental in seeing Zambia as world wide inspiration for rural development, and focus on partaking in rural areas in deprived communities. It has the ambition to scale up the approach to entire rural Zambia and beyond.

2. ENVIRONMENT

2.1 Location

Macha is located in the Southern Province of Zambia, 70 km from the nearest town of Choma and 350 km by road from the capital city of Lusaka. The topography of the area is somewhat undulating, primarily open savannah woodland averaging 1,100 meters above sea level. The climate is tropical. The Macha area is populated by traditional villagers, living in small scattered homesteads which usually consist of one extended family. There are no commercial farmers or industries in the area. The primary livelihood is subsistence farming with maize being the main crop.

There is an estimated population of 135, 000 within an approximate 35 km radius around Macha. Overall population density in this area is 25 per square kilometer and 50% of the population is under 12 years old. The average income for a person in the village in the areas surrounding Macha is \$1 per day. A bus trip to the nearest town of Choma costs approximately \$5 and it takes about two hours to travel the distance. The money spent on this journey equates to several days' salary for a person living in this rural area.

A most rural areas, Macha has ver limited infrastructure. There is a hospital, medical research institute, schools, and community

activities. Clearly, the health institutions require and expect high quality telecommunication services to be able to offer high quality and efficient health care. Only dirt roads link Macha to other villages and towns. Electricity is available to the privileged few only. Moreover, the supply is unreliable especially during the rainy season when several outages per day can occur.

2.2 Obstacles

The challenges for implementation of ICT in rural Africa are immense. Macro economic [4], social, engineering challenges, and most importantly cultural issues, are extensive and not well researched. Slowly some papers appear, among which was "Bringing Internet connectivity to rural Zambia using a collaborative approach" [5]. Macha Works involves all stakeholders extensively from the very start of interactions, to assure all obstacles are identified and addressed.

In ICT engineering, Macha IP based network consists of a 3 tiered Wireless Local Area Network (WLAN) connecting approximately 90 wireless routers, which aggregates traffic from a single Very Small Aperture Terminal (VSAT) C-band satellite connection to the Internet. The VSAT connection has a committed download speed of 128 kbps bursting to 1 Mbps and a committed upload speed of 64 kbps bursting to 256 kbps. The total monthly cost of the C-band VSAT connection is an excruciating USD 1,200. During March 2010 the community did upgrade the connection threefold, paying USD 4,000 per month, while generating a daily traffic volume of over 20 Gb.

At the first tier, the wireless backbone makes use of point to point links between high sites which form a layer 2 network with wireless bridging. At the 2nd tier, these high sites then connect to outlying sites in Macha using directional antennas mounted on buildings. Some of these outlying sites make use of a mesh network between buildings to spread this connectivity to other buildings in the area [6].

There are two main engineering obstacles that need to be addressed when scaling up this network. The first is the limited capacity of the satellite link which should be increased to further address the connectivity needs of the community. The second issue is that the current mesh networks cannot scale beyond using approximately 4 hops, at which point the mesh becomes the bottleneck to the Internet. Carrier grade mesh networks with multiple radios are being envisioned to further the range of the network and scale to sizes beyond 50 wireless routers.

3. IMMEDIATE RESULTS

Direct results from the Macha Works activities is improved relations, in a wider scale than before the intervention. With Information, Communications and Telecommunications infrastructure available, the community starts to interact in a wider context.

3.1 Social Networking

Analysis of the Internet usage in rural Macha shows that 63% of the traffic is Web based. This is in stark contrast to urban studies which show that only 30% of traffic is Web based and the majority of traffic is peer-to-peer traffic

Of all Web traffic, Facebook was the most visited web site, 3 times more popular than the next top ranked web site Google. A recent news article reported that Facebook overtook Google in North America in terms of number of hits in March 2010. In Macha that crossover point was reached many months earlier.

Facebook allows people to sharing relationships, in rural Africa culturally more valued than retrieving information. It also supports a learning process more focused on the community than on the individual. In rural Africa, social networking via the web is for local people and visitors a valued way to keep in contact with friends or family, certainly in view of challenges in transport and other means of communications.

Zambian news sites are also very popular, and the only constant source of news in lieu of newspapers or radio.

3.2 Supporting other infrastructure use

Introduction of Internet in a rural African setting influences all aspects of infrastructure use, and health, and educational activities, in analogy with the influence of the introduction of telephone. Macha Works presented the Zambian traditional leaders at the House of Chiefs over 200 hundred activities that became possible with the introduction of Internet, which were not possible before Internet was available [7]. Most notable are:

- 1) supporting operations and scaling up of health care and health research in the local community;
- 2) preservation of cultural heritage;
- 3) supporting continuous education of local talent and institutional leadership;
- 4) supporting entrepreneurial activities and innovations in the local community;
- 5) engendering innovation and supporting new approaches in education on all levels (primary, secondary, tertiary, and vocational).

Among many developments, access to on-line databases allows participation of rural areas to partake in health care research, leading to peer-reviewed publications [8]. Also new form of innovative music education are possible and thus 'ePiano' is performed via Internet [9].

4. MACHA WORKS MODEL

A number of principles underlie the approach and changes that occurred in Macha. With ICT available as an information infrastructure backbone, there is a distinct method which led to the Macha community to become vibrant and thriving with entrepreneurial people.

Within the African relations-focused society, those principles encompass two preconditions and five elements of change.

4.1 Precondition 1: Vocation

Developments in Information and Communications Technology started with *people*. As such stakeholders first addressed issues of calling or purpose. This personal sense of urgency or a sense of excitement drives developments. It provides a source of energy for change, to get going, to endure setbacks, and to overcome barriers along the way. Vocation gives the necessary guidance and opportunities to connect with other people, fuels positive and optimistic drive, and the source of dreams, sense of excitement, and hope that empowers growth.

4.2 Precondition 2: Commitment

In the Macha Works Model, Vocation is supplemented by explicit commitment. In analogy with *seasons*, stakeholders do not primarily commit to time restraints or periods. In the relationship oriented society of rural areas, there is common understanding

that implementation will take the time, and a period that not necessarily can be defined upfront. However, it can be defined as *a season*. This season can be defined as the period that exists between *the dream* (or vision) and *seeing it in reality*. As such commitment is seen as covering a longer period and connected with life of individuals.

It can be observed that most development projects are based on a planning with specified time periods. Experience shows that the prescribed periods are usually too short. A season is needed to be able to contribute. In the relational environment, this implies that *the whole system* and all stakeholders sympathize and commit to the season.

Without such commitment, there is little chance for success.

In the resource constrained environment, it was observed that if the community feels that a change is temporary, in view of resource allocation decisions, commitments remain subdued. Temporary things must be kept from the community. When change is perceived to affect the community permanently, commitments come swift.

4.3 Change Element 1: Observe

A multitude of experts came to work at Macha. Some came with an explicit, preset agenda, others with an open mind, to observe and to learn. Periods spanned one week, several months, or even years. Effectiveness varied. Some labored and their work did evaporate shortly after they left. Others worked, and a legacy continues to exist and bloom. Experience shows that in order to reach enduring results, it is necessary to spend considerable time observing and then serve in the community in accordance with what was learned. Those whose motive was to edify the local community have been most effective. Unless specifically invited for applicable expertise, those that came with an attitude of knowing what to do had limited effect. Those who asked what others could do for them have gone and their interventions did not linger.

Those who were able to observe the needs of the local community, and did accept all the arrangements made by the local community, earned the love and respect of the local community.

Thus the first Change Element is *to observe*. It takes time to look, listen, and really try to understand what is happening. Such understanding is tested by talking with people and checking. It involves observing the whole system, finding the underlying currents. The community recognizes it as it is a vehicle towards knowledge and trust. Essentially it supports building relationships, which is most important in communities that perceive time and space differently. Only when relationships are existing, interventions can happen.

Most companies are separated over many thousands of kilometers and with few communication paths or sketchy personal experiences, the information an audience possesses about rural Africa is quite limited. Such is solved by supplying the facts, via Internet and more. But the disposition that most audience bring with its prejudices and biases about rural Africa is more difficult to address. Years of negative mass-media messages, pictures of disasters, and stories of mismanagement have taken their toll. It becomes even more complex when world views, frame of references, and personal perspectives are taken into account.

4.4 Change Element 2: Modeling and Sharing

Modeling and Sharing deals with formulating solutions for the main need observed. It analyses the issue, and applies a good dose of creativity. Lessons from history or from other similar situations are heeded, and stakeholder analysis, SWOT analysis and holistic thinking applied simultaneously. This is a highly creative and analytical phase.

4.5 Change Element 3: Waiting

Usual theories of change do not encompass the notion of *waiting*. The rural community recognizes that every thing has its appointed time. Victor Hugo said: "There is nothing more powerful than an idea Whose Time Has Come". In the Macha Model, one waits for the right people and for the right time. Local Talent will stand up and take their responsibility, a process which is difficult to plan.

Making a plan and 'just getting it started' might have yielded limited result on the short term, but did not produce long term results nor has engendered sustainable progress. Thus in this phase the core solution is shared with many people in various positions. Subsequently one has to wait for someone to come and pick it up. It may be slow, but if the envisaged intervention is worthwhile, it will be recognized and there is someone who will go with it. When it has taken long, one 'throws pebbles in the pond'. But one should not make waves, because we should allow for the local talent to take up that role.

At this stage it is important to be in contact with the right people. People with dreams, that think in possibilities. The time of waiting is a time of expectation. It is also a time of perseverance, especially when it takes long before someone stands up. And as power or authority is important in a community, then this is the time to give people space and mandate, to give people the opportunity for their vocation and their dreams.

4.6 Change Element 4: Mentor and Connect

At this stage, action is possible. A local talent stood up and now there is time for change. Vocation and commitment is put to the test. Probing questions are asked, but also one creates space, encouraging the local talent and local community to go on.

The local talent is put to action and guided. The wait is over and the train is rolling. At this stage implementation takes place, fast and practical. As an example, in Macha in one week an education center with computers was built and students started to be educated. During this time, tools are utilized, resources flow, and fast progress is enabled.

The difference in dynamics - between the fast pace implementation and the wait period - is typical of the approach followed in Macha. It aligns all stakeholders, gives time to different people in the process.

4.7 Change Element 5: Show

The final element of the Macha Works Model is that results are achieved quickly. This by embracing barriers with a positive attitude towards the challenge, in all overcoming skepticism. Therefore implementation must be done quickly. Resource-limited environments are flooded with promises, without seeing them materializing. Therefore at the Macha Works Model one ensures that there are rapid visible results. This gives new energy, and confidence.

5. ANALYSES

The Macha Works Model does align with much literature, as example the following parallels:

1) 'Seven habits of highly effective people' by Stephen Covey, identifies: "first try to understand before you want to be understood". This is exactly what happened in Macha. First there is a period of observing and listening, to gain a respectful understanding on what is going on, prior to engendering any action. In this, Macha Works incorporates various theories, models, and insights, for instance value systems theories.

2) There is a coherent concept described by Otto Scharmer and Peter Senge. Other books addressing this are "Presence" (Senge cs.) And "Theory U" (Scharmer). The idea is that it is important for fundamental change to assure an open mind, and truly listen to the essence. That means that one really has to take time and rest to find out what really matters. One listens not with the head, but with the heart, with the whole being. When the time of insight comes, action follows, smooth and quick. This logic is apparent in the Macha Works environment where there exist different dynamics in watching and waiting on the one side and fast pace and achieving results on the other hand.

3) Further recognition is with Jim Collins. His book "Good to Great", deals with the question of why some organizations have achieved major transformation and others not. He discovered in answering that question the principle of "first who, then what". As such first one ensures relationship with the right people, before one decides where one goes. Most organizations act the other way around: first devise a strategy or a plan, then find the people. Such does not work postulates Jim Collins. *Who* first, then *What*. This matches experience and the Macha Works Model, in particular in the focus on local talent, upon which those then are mentored, developed, tested and guided.

4) John Kotter in his book "The Heart of Change" designate "Commitment from the top 'and' Show Quick wins" as key success factors. These factors come back in the approach of Macha Works. This is evident in the Precondition "commitment" invoking personal drive and solidifies vocation. But it is also evident in the commitment expected from the local talent.

The focus on concrete and quick results is the element of showing quick wins as a clear success factor.

5) Lynda Gratton in her book 'Hot Spots' deliberates on the reasons why some organizations or divisions are 'hot': Why there is a lot of action, happenings, a lot of inspiration, and a lot of achievement. One factor mentioned is that a sense of urgency and sense of excitement by asking questions. These are called 'igniting questions'. Questions or comments that made people stop and think, and then come in action. The Macha Works Model does so during the Change Element of 'Modeling and Share'. People in the local community and opportunities are triggered by questions, which are igniting hope, expectation and brings out the local talent.

6) Further parallels are found in Systems Theory. Examples include Russell Ackoff's book 'Redesigning the future: a systems approach to societal problems'. It indicates that a business cannot be separated from the system and the context in which it acts. Further more discipline cannot solve complex business problems. Everything is interconnected and therefore important. The whole "system" is to gain understanding. This holistic view can be found at Macha Works where the whole system is "in flux". It is the connection between government, the chiefs, all stakeholders, and the local individual.

7) Lastly, we find important parallels in the thinking of Edgar Schein. His book 'Process consulting' deals with the question of what 'help' really is. He shows the need to be open minded and participate in helping those who need help. It is counter productive to formulate many solutions. The crux is that those supported discover, self start, and deal directly with the challenges and opportunities. We are fellow travelers and mentors. This way for serving is apparent in Macha Works.

6. CONCLUSION

Macha Works! And shows lessons on how the Internet and the opportunities it provides fuels sustainable progress in rural Africa. It provides input for governing authorities and tabulates a process to engender entrepreneurial communities. By igniting holistic development 'bottom up', supported by fitting ICT infrastructure and Internet connectivity, in a motivating, inspired and edifying community, real, enshrined, and sustainable progress is feasible.

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