International Rainwater Harvesting Alliance
Alianza Internacional para la Gestión del Agua de Lluvia *(IRHA)*
Alliance Internationale pour la Gestion de l'Eau de Pluie *(IRHA)*

Africa Safe Water Foundation (ASWAF), Nigeria

BLUE SCHOOLS IN LUWASA
Lagos, Nigeria
Final Report

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A. Reminder of the objectives

General objective: To improve access to water, sanitation and environmental conditions in a school as a framework for the personal development of the children.

Specific objectives:

- To improve access to water and sanitation in the school;
- To improve the environmental conditions and nutrition in the school's area;
- To reinforce social and specific capacity of the local population to cope with water shortages and to manage the new facilities in a responsible way;
- To facilitate the creation of a rainwater harvesting schools network in Africa and to contribute to the emergence of a new generation of environmentalists.

Before the project, the only water supply in Luwasa School was pumped from a borehole. However, during our last visit, the borehole was dry and its taps were not running. Students in the senior section had to buy their own water and bring it with them. Plastic water bags could be seen strewn across the school grounds, particularly around the toilet block.

The toilet block was a basic concrete structure with four pit latrines. It was extremely unsanitary, buzzing with flies and all the pit latrines overflowed into the entrance of the block. The latrines were not flushed or cleaned regularly due to the lack of water. Many students preferred to defecate outside in the nearby bushes of the school compound, rather than use the latrines. The lack of proper latrines in the school had a negative impact on school attendance, especially for girls who need more privacy.

Here it is important to note that between the project submission and the start of its realisation, the school population increased from 1'258 to 1'617 children and staff.

B. Activities

1. Preparatory activities at the start of the project

This activity is to bring the project to the attention of the relevant stakeholders and to encourage their support and participation. It is also to raise awareness of the sustainable management of resources and to encourage the community to reproduce the strategies implemented at the school in their homes.

The local partner was in contact with the authorities (the Ministry of Education in particular), parents of the students and teachers throughout the project formulation. Meetings were organised at different levels to present the project, its objectives, contents and the implementation strategy. Emphasis was put on the need for community participation, ensuring their active involvement in the management process. The responsibilities of the various actors were also discusses as well the importance of establishing a PACT Committee.

2. Creation of the Parents–Authorities–Children–Teachers (PACT) Committee

The PACT Committee is a local management structure created at the start of the project. It is the representative body of the beneficiaries. Its role is to ensure the project runs smoothly during the implementation phase and remains sustainable after completion. The PACT Committee is responsible for the maintenance of the facilities and for the sustainability of the reforestation and awareness actions.

The local partner explained to the beneficiaries the need to create and train a management committee - the PACT Committee. The parents and teachers then elected 21 members to the Committee and distributed the roles and responsibilities among them. Each of these members will train another person and student in their field of expertise, guaranteeing the presence and renewal of PACT Committee members.

The PACT Committee followed all the construction activities and is now responsible for the maintenance of these new facilities. The PACT Committee is operating effectively, enabling community autonomy with regards to water and sanitation access and plantation and garden maintenance. A detailed list of the PACT Committee members is available in the annexes.

Results

- Luwasa School has a representative body that has been democratically elected and manages the project and maintains the facilities effectively.
- The Blue Schools project is supported by a local structure consisting of all the community entities involved in its development.
- The roles on the PACT Committee reflect all the components of the programme: water, sanitation and reforestation.
- The creation of the PACT Committee was perceived by the stakeholders as a new form of development governance that puts the beneficiaries at the heart of the process. This approach has helped to increase their motivation for their responsibilities in the implementation of the action.

3. Construction of the rainwater harvesting systems

This activity aims to make Luwasa school autonomous with regards to water access (for drinking and hygiene purposes).

Due to the increase of school population and in order to provide enough water for the schools, 5 rainwater harvesting systems (4 cement tanks of $50m^3$ + 1 flexible tank of $100m^3$) have been built instead of the 2 tanks of $50m^3$ mentioned in the project submission. It makes a total capacity of $300m^3$ instead of $100m^3$.

At this time, four $50m^3$ concrete tanks have been built and connected to gutters. The tanks are filling with water regularly and are working well.

All the tanks are equipped with a filter, overflow, drain and four taps. The tanks have been painted and a drainage system has been implemented on two of them to avoid the area around the taps becoming muddy.

Two of the school roofs dated from the late 70s and were in a poor state. These roofs have been renovated to allow efficient collection of rainwater.

As the water has to be of drinking quality, it is treated with an active chlorine solution. The solution is produced with salt electrolyse (NaCl) using low voltage. The PACT Committee has been equipped with a WATA system (supplied by Antenna Technologies/Switzerland) and the members have been trained to use it. This assures the school's autonomy with regards to potable water.

The neighbouring population may also benefit from this solution for treating household water in the future. Indeed, the chlorine solution produced at school can be sold to the local population. It can also be distributed to the children to be used at home. The dissemination of this practice amongst the population is encouraged by the IRHA and the local partner. However, it is the decision of the PACT committee to start such an activity of chlorine solution distribution.

Results

- The school has enough water for all its needs (drinking water and hygiene purposes). This was not the case before the project because the borehole at Luwasa is dry.
- Students and teachers no longer need to buy water.
- Hygiene in the school has been improved due to the increased availability of water.
- The PACT Committee has been provided with a water treatment system and the members have been trained to use it.
- The combination of these achievements means the entire school population is now provided with clean water.

Work to be completed

- A first flush system needs to be installed. For the moment, the PACT committee disconnect the PVC pipe from the gutter during the first rain, but this solution is not comfortable. The problem is that the right size PVC plug is not available on the local market. IRHA and ASWAF are still working to find this plug on local market or import it from Benin.
- The $100m^3$ flexible tank, manufactured by Labaronne Citaf, needs to be installed in the school. We are waiting information on clearance before sending it.
- The local partner needs to proceed to a complete water analysis (concentration of NO and SO_2, as well as the pH values).

4. Construction of the toilets with hand washing facilities

This activity aims to provide adequate access to toilets for children and teachers (separated for men and women and with no more than 30 children per toilet).

Due to the increase of school population and in order to provide toilets facilities for the children and staff, 47 toilets and 18 urinals have been built instead of the 32 toilets and 12 urinals mentioned in the project submission.

Construction of the toilets and urinals was achieved in February 2013. The following facilities have been built:

- 2 blocks of 7 toilets for girls in the junior section
- 1 block of 8 toilets for boys in the junior section
- 1 block of 9 urinals for boys in the junior section
- 2 blocks of 7 toilets for girls in the senior section
- 1 block of 8 toilets for boys in the senior section
- 1 block of 9 urinals for boys in the senior section
- 1 block of 3 toilets for teachers of the junior and senior sections, with separate entrances for men and women

The toilets built in the project are Urine Diversion Dry Toilets (UDDT). This type of toilet has several advantages when compared to traditional toilets:

- The ventilation pits used alternatively reduce the presence of bad smells and the proliferation of flies, which can carry diseases. A variety of products can also be used to neutralise the smell and facilitate the compost reaction, such as ash, sawdust, cereals husks and some other unused agricultural residues.
- They are dry toilets (water is only used for washing) so preserve water resources.
- They can be emptied safely and with no risk of contamination as the pits are used alternatively and urine and faeces are separated. The final products are compost and urine, both of which are biodegradable and can be used as fertilisers.
- The presence of human pathogen agents in the groundwater is reduced or nonexistent.
- UDDT toilets are easy to maintain.

Results

- The children and teachers now have access to sanitation facilities (no more than 30 students per toilet). Their health and comfort has been improved.
- The school grounds are much more hygienic as the children no longer defecate outside; contamination and bad smells have been reduced drastically.
- In the future, during the following period, the attendance rate, punctuality and safety at school will be improved as children no longer defecate outside. This will make the teachers' work easier and the students' results better.

These toilets are a strong example of efficient low cost ecological sanitation in the project area.

Work to be completed

- The toilets need to be equipped with hand washing facilities that use rainwater collected from their roofs. The hand washing tanks are flexible ones, manufactured by Labaronne Citaf. We are waiting information on clearance before sending them.

5. Training the PACT Committee

This activity aims to give the PACT Committee members the knowledge and tools they need to maintain the new facilities and continue awareness raising with the local population. The PACT Committee members play an important role in passing on what they have learnt during their courses to the students, teachers and local community.

The PACT Committee members have been trained on the following topics:

- Maintenance of the rainwater harvesting systems
- Maintenance of the UDDT and urinals
- Maintenance of the plantations and garden
- Health and hygiene
- Environmental protection
- Peace and tolerance

The PACT Committee members have received a total of 50 hours of training. A detailed list of the training sessions is available in the annexes.

Results

- 21 PACT Committee members are trained to maintain the new facilities and to ensure the continuity of the achievements once the project is finished. Each member has a well defined role and set of responsibilities. There were 11 training sessions equating to 50 hours of training.
- The PACT Committee members' knowledge of the themes developed by the project is improved. All the members have received technical documentation of the content of the courses. The PACT Committee members are now able to hold outreach sessions with the students and general public.

6. Reforestation

The objectives of this activity are numerous. Firstly, the children develop a direct emotional connection with their tree, giving them a sense of responsibility. Secondly, this activity helps to improve nutrition and creates a small income through the production of fruit. Finally, it reduces erosion, provides shade and retains carbon dioxide.

Due to the increase of school population and in order to provide enough trees for the schools, 1,700 trees have been planted instead of the 1,198 trees mentioned in the project submission.

The PACT Committee chose to plant orange, mango, cashew, coconut, banana and papaya trees. The young trees were protected with cages to ensure they were not damaged by animals. Each child planted their own tree and wrote their name on the cage, so they can recognise and take care of it. The National Open University of Nigeria provided its assistant for the activity to help the committee and children concerning the plantation method, the type of species to plant, etc. A letter from them is available in annexes. A complete list of the planted trees with surviving rate is also available in annexes.

Results

- 1,700 trees have been planted and on 1st April 2013, 1,073 had survived. So the survival rate is 63%. But compared to the primary objective of 1'198 trees planted, the objective is reached at 90%.
- Reforestation has helped change the face of the school by improving its environmental quality.
- Reforestation initiated in the school creates a dynamic in the field of environmental restoration. It plays an essential educational aspect, instilling the children with a responsibility for their trees and environment.
- Children, families and residents are now aware of the importance of reforestation, the role of trees in environmental protection and the water cycle.

7. Creation of the vegetable garden

The objectives of this activity are to improve the students' diet and to strengthen the financial autonomy of the school. It is also a means to get the children interested in agricultural techniques and to offer them practical learning in this area.

One vegetable garden has been created in the school. The vegetables planted are Amaratus, Pumkin and Okoro. The approximate size of the garden is 30m by 50m. The garden is maintained by the PACT Committee and students under the supervision of the agricultural science teachers at Luwasa. The school authorities and the PACT Committee are responsible for the distribution and sale of the garden produce.

Results

- Children are more connected with their environment and have a practical example of good agricultural practices.
- Children and the PACT Committee will contribute to improving the diet of the school population once the first vegetables will be harvested.
- Once the first vegetables will be harvested, the excess production can be sold at market and strengthen the financial autonomy of the school.

Work to be completed

The garden needs to be fenced by the PACT Committee.

8. Training local craftsmen

The objective of this activity is to strengthen the local community's capacities to cope with climate change and in resource management. It is also a means for the project to reach out to the local community. The trained craftsmen can reproduce the facilities at a household level, following interest created by the project.

12 craftsmen from the local community were given the opportunity to receive practical and theoretical training on the construction of the water tanks and UDDT toilets, which are uncommon in this region. Strong interest in this training meant 12 craftsmen were selected rather than five. A list of trained craftsmen is available in the annexes.

Theory training started in May 2012 and the craftsmen learnt and progressed quickly through the topics of rainwater harvesting systems and UDDT, according to their respective professional areas (masonry, welding, carpentry and roof guttering).

They received on-the-job practical training through working on the construction of the water tanks and toilets and the renovation of the roofs. This method was particularly enriching and relevant for the craftsmen, as the foreman, engineers and employees were able to share their knowledge and expertise with them. Furthermore, the craftsmen provided substantial assistance during the construction of the facilities.

This is the start of a dynamic endeavour, which should eventually enable these craftsmen to reproduce this type of work at the household level.

Results

- 12 craftsmen have followed practical and theoretical training courses on the construction of rainwater harvesting systems and UDDT.
- The knowledge of the local community is strengthened in these two fields.
- The trained craftsmen will be able to reproduce these facilities in the local community.
- The 12 craftsmen increased their business opportunities through their new knowledge.

C. Difficulties and conclusion

1. Difficulties

Several difficulties have been met during the project. They can be listed as below.

- The signature of the contract with the local partner has been delayed. Indeed, discussions about the facilities design and materials to use, and negotiations on the materials' cost and quantity took longer than expected. So the first contract for 2 cement tanks has been signed in October 2011 and the second contract concerning the rest of the activities was signed in February 2012. This explains the fact that some activities are not 100% complete on March 2013 and will be achieved during the following up period.

- Some technical difficulties have also been met. It is the case for the first flush system. Indeed the local partner has not found a plug with the appropriated size to put on the PVC pipe. We are still looking for this PVC plug on the local market and if this problem is not resolved soon the material could be imported from Benin.

- Another technical problem was faced for the squatting pans. Indeed urine diversion squatting pans were not found on the local market. So they had to be made by local artisans manually. This has led to delay and extra costs.

- Another difficulty is to send the flexible tanks (1 tank of 100m³ and 5 tanks of 5m³ and 10m³ for hand washing) to Lagos. The flexible tanks are ready at the factory in France but it is difficult to find the clearance price at Lagos port, and we would like to get this information before sending the tanks.

- Another difficulty concerns the budget. The costs of some activities were higher than expected. It is due to the increase of some material price and of some labour. It is the case for the rainwater harvesting systems, toilets and urinals, plantation and PACT committee training.

- The last difficulty faced was a heavy storm that destructed the roof of 2 blocks of toilets.

2. Conclusion

Most of the activities were executed as expected and most of the objective of the project has been reached. The school and the Lagos states government are satisfied of the project, as beneficiaries that are very thankful to ASWAF, IRHA and all donors that supported the project. Some thanking letters are available in annexes.

The four rainwater harvesting systems are working well. Once the flexible tanks of 100m³ will be installed and once a solution will be found to install the first flush system, the school of Luwasa will be autonomous regarding drinking water access. The objective will then be reached at 100%.

The 47 latrines and 18 urinals are all achieved according to the plans. So all the children and staff have now access to proper sanitation, separated for boys and girls and in a sufficient numbers (not more than 30 children per toilet). Once the washing hands facilities will be installed, the objectives of this activity will be reached at 100%.

The plantation activity was a mitigated success, with 63% of surviving trees. However, we know that reforestation activity has never 100% of surviving rate. It is a long term activity and the school will proceed to more plantations every year to continue this activity.

The PACT committee has been created and trained and is now able to play its role of maintenance, survey and sensitization. So the objective of this activity is fully reached.

The vegetable garden has been realized and the first harvests will come soon. Once the garden will be fenced, this activity will be achieved.

The local craftsmen training on rainwater harvesting and ecological sanitation facilities building has been successful. More people were trained than expected. So we can consider that this activity has been completed over than 100%.

The project is now entering in the following up period of 3 years. The needed adaptations will be realized as soon as possible. The local partner will continue to survey the on-going activities. Indeed ASWAF will continue to help and work with the PACT committee and the school. The objective is now to see how the PACT will play its roles and to take measures if something is not working properly. Now the school will have to manage the facilities and continue the activities autonomously. ASWAF and the IRHA will follow this important process for the next 3 years.