Building Climate Resilient Schools – Lessons from Runesu Primary School in Zimbabwe





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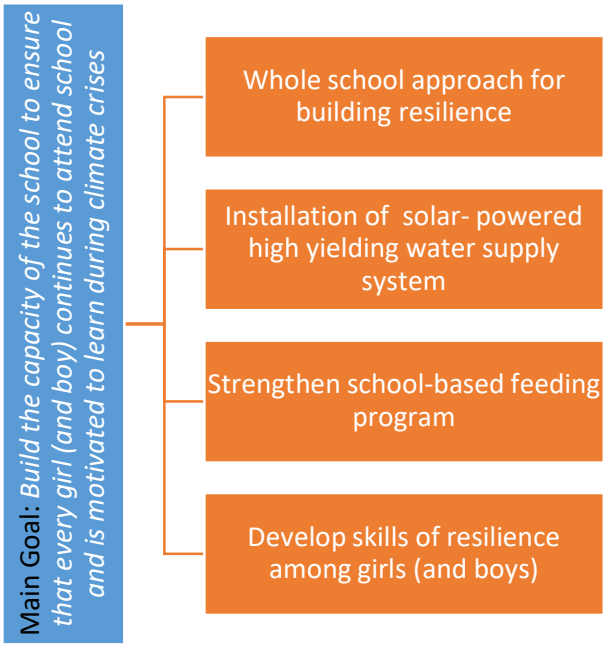
Background

The effects of climate change present devastating consequences on many districts in Zimbabwe, of which Chivi District is no exception[1]. Chivi district, situated 70 km southwest of Masvingo town in Zimbabwe, lies within the agro-ecological regions four and five, which are semi-arid regions highly characterised by poor rainfalls, high temperatures and continuous dry spells (Gerhardt & Nemarundwe 2006; Scoones et al. 1996). Poor soils in this area cannot produce good yields without the use of fertilisers or manure, which are not readily available to all households. The rainfall that is received per annum is 530 mm on average, and drought is a recurrent phenomenon occurring almost three years out of every five years (Gerhardt & Nemarundwe 2006).

Evidence from periodic context monitoring through IGATE Transition project, suggests that these recurrent droughts are one of the major contributing factors to school drop outs with parents and learners themselves opting to address their short-term food needs and foregoing education. Building the capacities of different players (learners, teachers, key stakeholders, and community members) to be resilient against effects of climate change such as drought, remains critical in addressing high dropout, irregular attendance and lack of concentration which is linked to food insecurity and water scarcity[2] in schools and communities.

In an effort to curb effects of drought on learning outcomes (mainly for marginalised girls); the Building Climate Resilience Schools Pilot Project was one of the first deliberate attempts by CARE Zimbabwe to integrate climate resilience into education and this presented an opportunity for learning for the CARE Zimbabwe Country office and beyond. The pilot project was implemented in Chivi district with the objectives that are in line with building the resilience of the school and the community to anticipate, adapt and respond to shocks as well as ensuring that girls (and boys) are motivated to learn especially during climate crises.

Summary of Building Climate Resilience Project



The project held stakeholder engagements including government ministries, schools and communities to ensure sustainability. Training on community based adaptation and participatory scenario planning was conducted to enable creation of community adaptation and resilience plan. In addition, a solar powered water system was installed and community representatives (aquaponics committee, water committee, and garden committee), teachers, and learners were trained on water systems use and management.

[1] Jaka H and Shava E – Resilient rural women's livelihoods for poverty alleviation and economic empowerment in semi-arid regions of Zimbabwe

[2] http://www.reuters.com/article/us-zimbabwe-drought-schools-idUSKCN0TA0WX20151121

The project also constructed a Fish Plant Technology system.

Method of Data collection

This paper used a combination of desk research and primary data with desk research including all project progress reports since the inception of the project.

Understanding of Climate Resilience in Education

As defined by the school head, climate resilience in education is "***when learning continues and the school has adequate water supplies and school projects even in the face of drought and floods***". The definition also acknowledge that there should be less disturbances to the learning process and hence the overall pass rate should continue to improve.

The Ministry of Education also defined climate resilience in education as **"*when the schools and surrounding communities are not victims of climate change as a result of availability of mitigation measures. Runesu primary school was said to be moving towards that as the school has adequate water supplies, at least for the school, garden and fish like what is happening at Runesu where the solar powered water system is supplying the school and surrounding community.*"**

Climate Resilience at Runesu- How far has the school moved towards climate resilience?

Source	Rating (out of 10)	Reasons for the rating
Ministry of Primary & Secondary Education (MopSe)	7	The solar powered borehole water system is functioning very well as evidenced by school and communities being able to meet their basics needs. For instance, the school can afford to do gardening, avail water to learners and teachers for multi-purposes including the fish plant. In 2019, the school managed to provide vegetables to compliment the government school feeding. Currently they have grown a lot of vegetables. On the other hand, the system for the aquaponics structures need more time. It is not yet established and there is still more work to be done
School Head	7	It is only one year and half since the water system was set up and may not give conclusions. There are 9 taps, 8 supplying the school and one located outside the fence to supply the community. The borehole is located 500km from school and the tanks are inside. The only limit we noted is that if we have 3-4 cloudy days, the pumping of water can stop as the panels are not supported by batteries hence limited storage
Teacher	7	The garden projects have been contributing to school feeding because the water supply has improved. However, the communities that are most benefitting from water supply directly are those very close by.
SDC/Aquaponics Chair	8	Community ownership is very high and everyone feels they have the responsibility to protect the water. There are no challenges with the water system save for the aquaponics system which the committee feel needs a shade.
Learners	8	There is a big difference from previous experiences before the water system. Pupils would travel 500 metres and spend a lot of time pumping the water and used to bring water for the flowers and garden from home. The school never used to have good crops in the garden except during rainy season.

Contribution of School, Community and Stakeholders to the School status?

The work at the school on the solar powered water system and the aquaponics structures presents an example of collaboration between the school and community. Parents contributed in form of labour by digging the trenches for the pipes and during the construction of the ponds. They also contributed through participating in planning and decision

making meetings in which they were forming rules and regulations in addition to assigning roles on the safe keeping of their systems. One of the major roles played by parents was to contribute cash towards maintenance of the taps. The community has identified two members who have knowledge on plumping and these provide on-going support on the maintenance of taps. The already existing community borehole minders were also selected to continue assisting after external support from the project.

Runesu primary school provided technical oversight over the projects in form of assigning teachers who would work with learners to monitor progress in their garden and fish projects. Two security guards were employed by the school to safeguard the solar systems and fish and the school is paying a monthly salary of 250 bond notes (February 2020) for each guard (USD20).

Learners at the school have a responsibility to switch on and off the pumping of water for the fish ponds and the feeding of fish. They also participate in the selling of vegetables from the school garden. The school has been getting a lot of support from the Ministry of Primary and secondary education through sharing ideas and ensuring the school is committed to maintaining the set up systems.

Success Factors for the Runesu Solar Powered Water System and Fish Plant Technology System

Drivers

Respondents cited a number of factors contributing to the success of the efforts towards climate resilience at Runesu Primary school.

- According to MoPSE officials, participation of Runesu primary school in the first phase of IGATE project and then the transition phase was one of the major factors that contributed to coordinated participation of the school and the community.
- Unity of purpose between the school and the community. Relationship between school and community has been excellent owing to the school and community engagements that has been happening over the past few years with interventions from IGATE project
- It was also confirmed that the School Development Committee (SDC) for Runesu is very active and they supported the setting up of solar powered water system and the fish farming at the school.
- The school involved learners in monitoring of school projects apart from providing labour in the school garden. Learners were capacitated to switch the pumps on and off and to feed the fish in addition to selling the crops from the garden.
- The continued monitoring by Ministry of Primary and Secondary Education (MoPSE) contributed to commitment by the school authorities and effective participation
- Presence of the District Representatives from the DAs Office, District Development Fund (DDF), and MoPSE was key for motivating and supporting the school authorities and community. The District Authorities encouraged the community to participate by automatically including families which participated in the school projects into feeding program through its social welfare department.

- The intervention was addressing one of the main challenges for the community- shortage of water due to drought. Both the school and the community saw the solar powered water system as a rescue to their problem hence willingness and commitment to make it a success

Inhibitors

- The government has adequate personal resources to provide on-going monitoring and services to the school but their support is constrained by limited transport and this has limited the presence of the departments such as District Development Fund (DDF) and Ministry of Agriculture.

To what extend has the solar powered water system addressed the water needs for both the school and the community?

School

Runesu primary school has been depending on a borehole located 500km away from its premises. The borehole would fail to supply the school during the peak of the dry season as the demand of water would increase with more communities coming to the school to fetch water from the borehole. The wells and other sources which the communities depended on would have dried up. However, coming in of BCRS project was a sigh of relief not only to the learners but the community at large. The improvement in the water supply at Runesu is very notable compared to the past where it was very cumbersome mainly for girls considering issues menstruation. With the setting up of the solar powered water system, Runesu primary school is now using taped water with eight (8) out of nine (9) taps around the school being utilised by learners, teachers and for garden and fish projects. Refer to garden pictures below;

The respondents testified that some of the challenges that they used to face at the school like buying relish for school feeding programmes were addressed as the school reached a point where the school garden would supply all the vegetables needs for complimenting the government school feeding programme. Runesu primary school earned income through selling of vegetables. Learners and teachers can easily access water inside the school and availability is throughout the year.

Community

In addition to satisfying the water for the school's needs as was shown in the picture, villages around Runesu primary school are accessing water through the solar powered water system as well. The community was allocated one (1) of the nine (9) taps that were set up and their supply is meant for household use. During the greater part of the year, about four (4) villages fetch water from that tap.

However, during the peak periods of the dry season, the number of villages supplied by the tap increase to six (6).

What does sustainability look like for the solar powered water system and Fish plant Technology Systems?

Sustainability of the solar powered water system at a school like Runesu was defined as "*when there is water throughout the year with minimal and affordable maintenance costs. The water is expected to benefit the school project including the garden and the aquaponics projects with no shortages. The system should be appreciated by all stakeholders supporting each other with school and community working together to ensure the benefits are well maintained*".

The respondents also emphasised that learners play an important role in ensuring the sustainability of the system. Highlighting one of the major challenges that the school faced soon after the installation of the system, the school head indicated that excitement by learners, considering their limited familiarity with taped water, posed a lot of damages to the taps and requiring regular replacements. The school has however passed that phase and there is reduction in the maintenance requirements. In addition to constant supply throughout the year, enhancing production, involvement of stakeholders and participation of learners, presence of local and readily available resource persons for maintenance particularly plumbers is key to enhancing sustainability. The stakeholders interviewed were all positive that the solar powered water system at the school is a success and there are very high chances of sustainability. However, respondents were all in agreement that the aquaponics required more investment in infrastructures like shade and identifying local experts in fish farming to work together with the aquaponics committee.

Mechanisms in place to ensure sustainability

- The nine (9) set up taps were allocated between school and community with school utilising 8 of the taps. The community tap was set outside the school fence enable easy access for the community while limiting disturbances to the learning processes.
- The community has a Water Point Committee to govern the allocation of water and coordinate the maintenance of infrastructure, for example replacement of taps. This governance structure meets every month to discuss maintenance issues.
- The school and community identified a plumper and village pump minders to provide the services if need arise
- Runesu primary school has hired security guards to look after the solar systems and the fish ponds to prevent theft. However, these are not trained guards.
- High community involvement in the management of the various projects such as the aquaponics- fish and vegetables plant. Refer to picture below,

One of the six fish ponds

Vegetable beds adjutant to the fish pond

Major Threats to Sustainability of the Pilot

- Cost of security. According to school head, the school had at that time hired two (2) security guards who were paid $250 each then. This has not been easy for the school as it struggled to pay for those guards.
- Need for improving the security system. Currently the guards that are hired are not trained security. School is also not properly fenced which may pose a risk of theft especially when fish are due for harvesting in addition to solar system itself. On the other hand, if the school and community decide to increase security by hiring trained guards the cost may be unbearable.
- Shortages of water in the communities around Runesu could lead to the water supply being too constrained as evidence shows that at the peak of the dry season in 2019, additional villages which were not previously fetching from the Runesu primary school borehole had also to get their supplies from the one community tap outside the school yard.
- More investment in equipment for aquaponics structures is required. It was observed that there was need to construct a vegetable shade as the produce for previous season (2019) were destroyed by heat. Possibly stating with a smaller structure could require less investment. Refer to picture below;

- The project requires intense monitoring by the school and committee members from the community hence need for all parties to remain committed.
- Maintenance could be more taxing and requires extreme coordination among all players.
- Relatively underutilisation of the Facilities. Despite setting up the facilities in 2018, at the time of data collection to inform this report in February 2020, the solar system was being used for pumping water only though it has capacity to provide electricity for the offices. The school therefore needs to demonstrate their ownership of the systems and to be innovative and going beyond what the project has left.

Summary of major changes

- At some point, the school managed to sustain the school feeding program by providing adequate relish to complement the government school feeding program. Before that, the school would ask for $2/ month per learner contributions from parents and not all parents could not afford it.

- At the peak of the dry season, the school supplied water to 6 villages including those that were not using the borehole before the setting up of the solar powered water system.

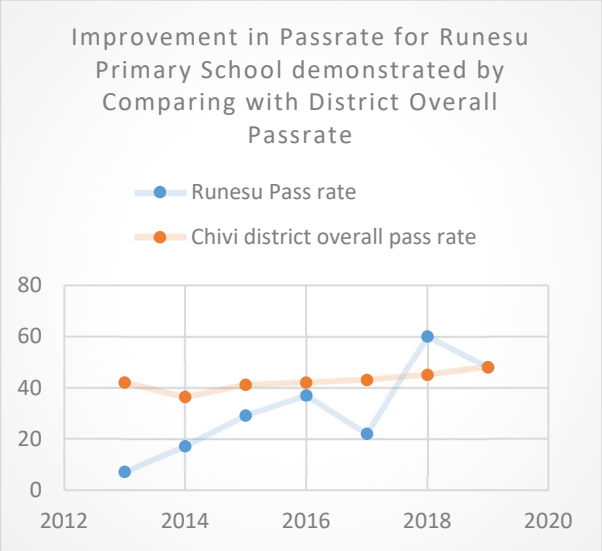
- Girls had difficult times during menstruation. Shortage of water in the school forced them to go back home during their periods. The increased supply of water gives them more time and confidence to learn as they can wash and get back to lessons.
- Exposure to technology. Getting to know more about solar powered water system and aquaponics system is a major milestone for learners at Runesu as they get to familiarise with technology.

Learners used to get water from a borehole about 500 metres away from the school, but can now

access water as there are eight (8) access points inside the school yard. The situation before would cause the learners to delay attending lessons as they would encounter some difficulties in fetching water as parents and other community members will be congesting the borehole.

- Building resilience through life skills – the distribution of responsibilities by the schools to learners contributes to building their resilience through acquiring life skills. Boys and girls reported to have participated meaningfully by feeding fish, switching on and off of the solar power for aquaponics and selling vegetables in the garden.

- The efforts by IGATE project through development of life skills for learners could have also contributed to the ability of the learners to participate meaningfully in school projects.
- Teacher motivation leading to reduced teacher turn over. The installation of the solar powered water supply system has become a natural



incentive to Runesu Primary School teachers and learners. As explained by the head of school, the easy access and availability of water in the school has naturally raised teacher motivation to teach and learners are now excited to come to school early to learn. With the current economic crises in the country, most teachers are demotivated and not very willing to teach, but this is not the case with Runesu. The availability of water in the school comes as a motivator for teaching. The teacher turnover has reduced from 5 teachers per term to zero in 2018 and 2019.

- A combination of improved attendance, more time for learning and teacher motivation resulted in improved learning outcomes. However, other projects in addition to BCRS contributed to the learning outcomes as well especially the IGATE Transition project through teacher professional development and development of life skills.
- The project also contributed to reduced soil erosion around the school yard. The school now has the capacity to plant and water lawn which is reducing runoff creating a clean and conducive environment for learning. Picture A and B below reflects on the before and after scenic view of the administration school site

Conclusion

Certainly the efforts of BCRS project have gone a long way in improving climate resilience at Runesu primary school. The solar powered water system has provided the school with continuously and readily available water for school projects, household use and drinking for learners. The availability of water resulted in improved production in school gardens, income from sale of vegetables, reduced burden for parents as the school could provide vegetables to complement the government school feeding programme. Most importantly, improved attendance and pass rates together with teacher motivation and retention resulting from availability of water demonstrates the importance of building climate resilience in education and it is inevitable that such intervention in other schools in the district and other districts with similar characteristics would improve learner and teacher welfare hence learning outcomes. Being a pilot, lessons were drawn from implementation that could inform other similar interventions including collaboration between school, community and the Ministry of Education, putting in place committees and measures that ensures maintenance and monitoring of the projects among others.