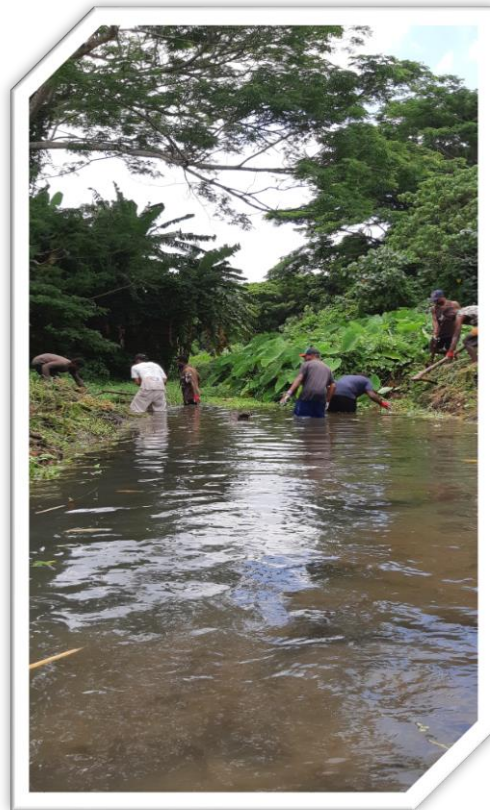


# A Report on Invasive Species eradication within matnakara Water protection zone 1 (MWPZ 1): Water lettuce (*Pistia stratiotes*)



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## ACKNOWLEDGEMENT

The International Water Ridge-Reef Project would like sincerely acknowledge these following implementing partners whom have tremendously put in the timely effort, and expertise to which this activity has been tirelessly successful. The Department of Environmental Protection and Conservation for their in kind contribution in terms of staffs and student intends as well as transportation. Secondly the local youth group communities of Freshwota 1 and Beverlly Hills for such effort in the physical eradication and cleaning of Tagabe River. Extending this acknowledgement to the RPCU for vehicle hiring approval and logistics.

Activity Name	Eradication of Invasive Species ( <i>Pistia stratiotes</i> ) in Tagabe River		
Project Site/Location	Tagabe River Catchment Area, Port, Vanuatu		
Contributing to/Achieving National Project Objectives	Component 3	Establishing partnerships for sustainable coastal area development	
	Outcome3.2	Community, local government partnership for sustainable land and surface water use preserving livelihoods.	
	Output 3.2.1	Tagabe River/surface water meets national standards to sustain livelihood purposes of Tagabe communities.	
	Targets End of Project	Best practice for community local government partnership for sustainable land and surface water use reported and replicated through National STAR Projects.	
Financial Expenditures	1 <sup>st</sup> and 2 <sup>nd</sup> Day	VUV 40,000	USD 342
	3 <sup>rd</sup> and 4 <sup>th</sup> Day	VUV 43,000	USD 368
	5 <sup>th</sup> , 6 <sup>th</sup> and 7 <sup>th</sup> Day	VUV 50,000	USD 342
	Transportation and Fuel for Hire Vehicle	VUV 11,000	USD 94
	Total	VUV 134,000	USD 1,231

## PURPOSE

Tagabe River like any other river located in Efate is invested with aquatic invasive species. To be specific, invasive plants that thrive in the water and ultimately disturb the overall role of biodiversity in such ecosystem as well as altering the hydrology aspects of any flowing water body. The purpose of this significant activity derives from the recommendation (report attached) made after a brief observation was conducted by both the hosting department and the project. As a result, *Pistia stratiotes* which is commonly referred to as “Water Lettuce” or “Water Lilly” and is well known for its ecological function as surface water filters. However, like any other invasive species they replicate fast and thus cover the river body at a flashing speed. Therefore, impacting the flow rate of the river and thus responsible to alter the entire aquatic community.

IW R2R Project reinstated its aim to eradicate this aquatic invasive through various physical removal methods. Apart from over ally maintaining restoring Tagabe River to its natural state, it is evenly important that this invasive species eradication actively benefit this following aspects.

1. Flow Rate of Tagabe River.
2. Enable clear visibility of water level.
3. Restore fresh biodiversity to an equilibrium stage.
4. Improve livelihood for river resident downstream.

## ERADICATION

### 1. METHODOLOGY

On the 30<sup>th</sup> of November and on the 2<sup>nd</sup> of December, a local community youth group was sent to Tagabe Pump station to physically eradicate (cleaning) the river which was the main water source for Port Vila. On the 9<sup>th</sup> - 10<sup>th</sup> of December (Phase 1) and 18<sup>th</sup>-19<sup>th</sup> December (Phase 2), another youth group from Freshwota 1 again were sent to the same location to carry out similar tasks as the first group moving downstream. Other invasive grass species were hooked

by a wooden wood and then with few machete chopping were dragged out and up the river banks.



Figure 1 Youth groups and DEPC student intends physically cleaning the river, removing the Water Lettuce (*Pistia stratiotes*) in Tagabe River Water Protection Zone 1

Hand gloves along with six bush knives (machetes) were distributed for the purpose of clearing out water lilies and a whole heap of Buffalo grass along with few vines from the river bank. In the process of this physical removal, the water lilies were only cleared by the workers using their hands, to gently grab the lilies from the river, and throw the lilies approximately 1 Metre away from the river bank.

While in the process of clearing the river bank, any garbage such as mosquito nets, empty and broken bottle pieces, pieces of iron and metals were disposed from the river bank. Banana trees and other trees which grew close to the river bank were also cleared from the bank so as to remove any blockings of sunlight on the river, and also prevents unwanted vines from the trees to grow on the river bank and into the river.

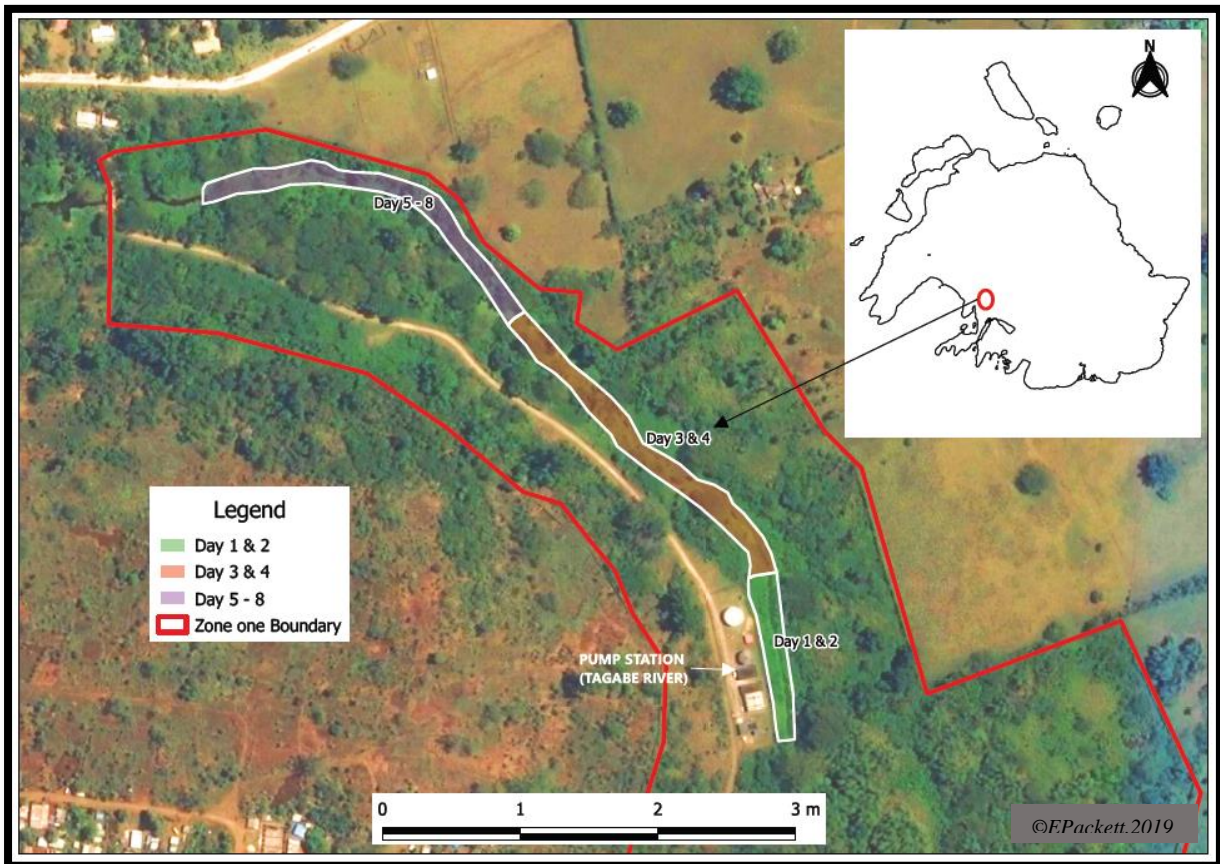


Figure 2 A map identifying the area of work in Tagabe River within WPZ 1 that was cleared on dates mentioned.

The clearing up of the river at Tagabe pump station was a changeable impact for the species that live in the river and also, for the communities surrounding the river.

## HIGHLIGHTS

1. Enabled the entire river at Tagabe Pump station to be cleared off and cleaned from garbage and unwanted vines and branches.
2. During the cleaning process, the work done by only a small number of people, made a huge impact to the river allowing for the clean flow of water.
3. Clearance of the river at Pump station may indicate to the public as well as government heads that the main water sources is taken care of as well as closely monitored.
4. The river cleaning process was significant as it confirmed the existence of Fauna species still thriving in river and as such this activity will favour their flourishing and thus an improvement in the river ecosystem.

5. The cleaning process involves young people consisting of youths and students. By helping out with the cleaning the river, the experience has given young people an insight to the importance of water resource security.
6. By clearing the river, the process displays how the river is an important part of the water cycle and reinstating its value as the only portable water supply source for the entire Port Vila.
7. Before and After



Figure 3 before the removal of invasive species in Tagabe River (WPZ 1)

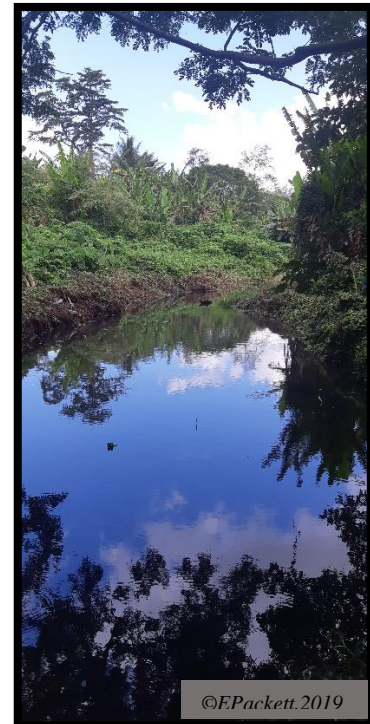


Figure 4 After the Clearing and Removal of Invasive Species in Tagabe River at WPZ 1

## OBSERVATIONS

While on ground coordination and implementation there were several observation closely been taken into consideration of which are of great importance to be addressed if strategic management should be taken.

1. During the clearing, it was observed in the beginning the water level was high and thus was very deep. The flow rate was very slow as a result. However as the clearing proceeded further, it was noticed that the water level dropped in a significant scale. Yet at some point halfway through the river, observation also confirms some spring water intrusion. This increase in the water level is perhaps due to existence of some these springs located in the middle of the river.
2. In terms of the aquatic ecosystem, through observation it was brought to our attention the present of fresh water fauna communities still thriving and surviving within the invested body of water. In maintaining this complex river ecosystem, each fresh water organism play a vital role or rather a fundamental niche/function to sustain the river, improving surface water quality.



3. The cleaning process entirely focuses on the removal of water lilies which fundamentally function as water filters and shelter for freshwater wildlife; however, at an alarming coverage, its role has become abusive rather than beneficial. Once it was completely removed, water levels have shown to drop as the water proceeded to naturally flow at a normal rate. This amplifies the factual reality and natural status of Tagabe River.
4. The need for more trees that need to grow along the river bank is the main component of a healthy river and an important aspect in creating resilience in the ecosystem to droughts, floods, and pollution. While tree roots stabilise the river banks and can reduce the level of erosion from happening and reduce sunlight to the water body.

## RECOMMENDATION

Regarding the observations/issues and concerns from these massive cleaning campaigns, there should be a more strategic response and integrative management of surface water, land, and riparian areas (land) engaging communities and to cabinet level to collaborate and effectively with greater assistance from government and non-government organisations. Therefore, the recommendations are as follows;

1. It is highly recommended to allocate rangers around the Tagabe river pump station to monitor and ensure that nearby communities such as Freshwota, Tagabe, Ohlen, and Switi area, will not trespass and engaged in any illegal activity in the river such as fishing.
2. The need for more advocacy, educative awareness, and knowledge sharing must be done in nearby communities to capture their attention and change in mindset practices. Observe Matnakara Water Protection Zones 1 as protected and taboo areas in which Port Vila's population depends on as an important water resource.

3. Establish Tagabe River buffer areas with close collaboration with Government Agencies and Traditional governing systems.
4. Eradication should extend to the lower catchment, outstretching the entire Tagabe River right to the coastal areas.
5. Physically monitor the growth of Invasive Species in Tagabe River and thus maintained a consistent management of its outbreak.

## CONCLUSION

In conclusion, the overall cleaning up the river inside the Tagabe Pump Station is a great achievement being done for the project. The Tagabe catchment area has various uses of water that have diminished the availability of water resources, therefore proper management is mandatory. This should make a way forward in monitoring and achieving strategic management plans of sustainable water resources management that are still in need. However, the Tagabe river catchment is the only source of portable water supply for Port Vila Community and Efate at Large, therefore it is the project best interest to maintain its significant value through effective ecosystem management approaches.