



Community Based Conservation of the Irangi Puddle Frog (*Phrynobatrachus irangi*)

With A
Grant from:



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REPORT FOR PROJECT
150510729



21/02/2016

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All was said and Done

Courtesy of:

Mohamed Bin Zayed Species Conservation Fund

Appreciations to our team at Gold Kenya; from the board, staff and volunteers. No one is greater than our partners. Thanks Karani, Galgallo and Wanjiku (Your names here, your minds there and the footprints of irangi frog you made are amazing). How would it be possible without Gatobu, Kiteme (Prof's daughter), Wandera, Kiage, Anne, Sunya, Chepkemioi (Yegon), Kwena, Saina and Daro.

Thank You David O. Shisya and Thank You so much Evelyne W. Kanjagua.

Our sincere acknowledgements to Dr. Patrick Malonza and the team from the National Museums, thanks Joshua, Justus and the disciplined people we meet there every time. A smile alone can empower a youth in a long-term Conservation Career.

And to;

Dr. Simon Loader (University of Roehampton), Dr. Victor Wesonga (National Museums of Kenya), Tari Doti and Leo Niskanen (International Union for Conservation of Nature), Mr. Francis (Kenya Wildlife Service, Embu), Mr. Ndirangu and Mr. Mwangi (Kenya Forest Service, Irangi Station), Mr. Murigu and Ms. Esendita (Mungania Tea Factory). And to all our supporters. With Gratitude.

And to:

The Irangi Frog Conservation Group and Gatekeepers of the Irangi Community. Thanks Mzee Simba, Muriithi (Raila), Muriithi (Eagle), Gataka, Nkrote, Nyaga Sr., Nyaga Jr., Bundi, Ndwiga, Njagi Kathara, Kagendo, Njeru Nahashon, Muchira Nthanjui, Munyi, Muthoni Ndwiga, Kabui Maragua, Mwenje, Micere, Kamau, Kinyua, Njuguna, Njeri Kathara, Gicuku, Ndung'u, Wanja, Mwendu, Dominic Mwaniki, Gitonga and Irangi Primary Staff and Pupils.

Dedicating to Professor Simon Onywere (Kenyatta University Department of Environmental planning and management.) His tireless work in Geographical Information Systems is of Great influence to us.

The organization is an eye opener to the Irangi community and we have found other "gold's" within Irangi. Long live Gold Kenya. Long life poor Phrynobatrachus irangi. Long live Mohamed bin Zayed Species Conservation Fund

Irangi Community

(by Anonymous or Name not indicated)

Dear Dad,

I am happy seeing you go around homes meeting farmers and advising them on how to conserve me and other creatures living here with me.

From a letter of P. irangi (Written by John Nyaga Sr.)

“

Amphibian extinction crisis is unlike anything that the modern world has previously experienced, and a large proportion of amphibian diversity is undocumented.

IUCN/SCC/ACAP

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Project Number

150510729

Project Details

The Community Based Conservation of the Irangi Puddle Frog

Species Name

Phrynobatrachus irangi

The Irangi Puddle Frog



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A Youth-led and Youth-based Organisation

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Photo Courtesy of Save the Frogs:
Credits, Ghana Pesticide Art 550.

“The threats facing *P. irangi* are like a lifestyle disease; the intentions were to live a good life When the method destroyed your life and that of others”



The forgotten frog; now remembered

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Phrynobatrachus irangi is the largest puddle frog in East Africa. It is labeled in the IUCN Red list as an endangered species and is threatened to habitat loss. The loss and destruction of the habitat where this frog lives is blamed largely on the community through their robust agricultural and forestry practices within and around the forest. With a seed grant of \$4886 from Mohamed Bin Zayed Species Conservation Fund, this project was established which was received warmly by the

Irangi Frog Community and local organizations. Through this effort, the project has established the largest community based conservation movement in Embu County, which is 150KM north of Nairobi, Kenya's Capital. Our story goes beyond the storytelling because it is only a piece of the longer story that happened, is happening and will be happening in the community. It is now a famous proverb in this community that, “Behind every great story, is a Generous Hand.”

We appreciate MBZ

“A grant of \$4886 from Mohamed Bin Zayed Species Conservation Fund has transformed many lives, build a foundation for the development of great careers for young and upcoming species conservationists. The Gold Kenya family are well pleased with the seed that this fund has planted in us”

~David O. Shisya

Board Member, Gold Kenya

The generous hand

The award from Mohamed Bin Zayed Species Conservation Fund came at the right time. Actually there could not be any other time better than this. The time when an endangered species really needs the com-

munity to undertake its conservation. This \$4886 grant sounded a petty amount in the ears of many but the amount of support it has given in empowering the community to own the species and its consequent local initiatives is overwhelmingly **ENORMOUS**.

“The grant was very helpful to the community around Irangi in the conservation of the endangered Irangi Puddle frog. The researchers were very friendly to us and we appreciate their work.”

~ Ruth Nkrote

Community Member

We appreciate MBZ



*A juvenile irangi frog on the palm.
Photo Courtesy of Gold Kenya.*

Now; Listen to this!

It is possible that the Kimande population is now extinct because of severe modification of the native habitat by local subsistence farming. This is also likely to be a threat to the species elsewhere in its range.

In a nutshell

This project involves the community in the conservation of the most threatened amphibian species in Kenya. The project recognizes the need for a holistic development and sustainability of the environment. As thousands of people seek to steer development, the extinction of *Phrynobatrachus irangi* frog can only be compared to a lifestyle disease (for it is as a result of the good thing of development and the prosperity of the community). The whole world is rising to control this disease, and so shall we by engaging the community to respond to the extinction of this important species. Through community involvement and strategic awareness creation, participation to conservation will be achieved and open way for Ex-Situ Facility.

Is this justifiable?

Phrynobatrachus Irangi is currently known from only

two montane localities in Kenya: Irangi Forest on the south-eastern slopes of Mount Kenya; and Kimande on the south-eastern slopes of the Aberdare Mountains. It probably occurs a little more widely in the Kenyan highlands (at least on Mount Kenya and the Aberdare Mountains). Its currently known altitudinal range is approximately 1,900-2,300m asl. Irangi Frog appears to be a diurnal species. Males have been found calling on the banks of small streams in montane forest, from under roots or logs, and from holes in the mud. It is probably dependent upon montane forest for its survival. It possibly reproduces in streams, although this requires confirmation. It is possible that the Kimande population is now extinct because of severe modification of the native habitat by local subsistence farming. This is also likely to be a threat to the species elsewhere in its range. Although not recorded from Mount Kenya and the Aberdares National Parks, it is possible that it does occur there, but further survey work is needed to better

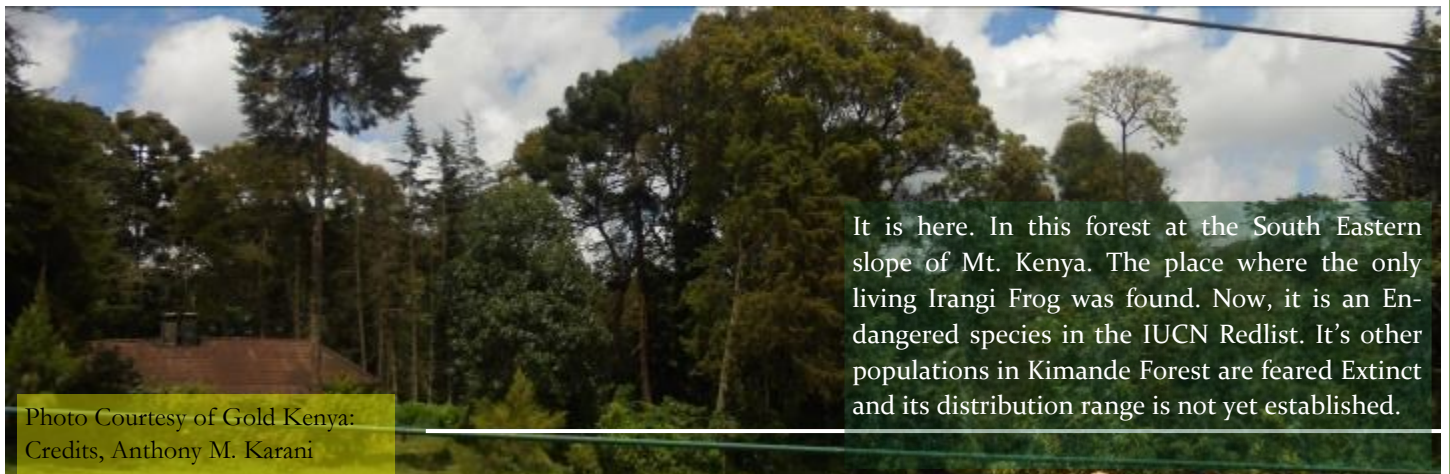


*A paratype of *P. irangi* preserved at the National Museums of Kenya was captured at Kimande Forest where it is now feared Extinct. Photo Courtesy of Patrick K. Malonga; Head of Herpetology Section at NMK.*



Selfie Moment: At Ena Stream 2100M ASL where the prototype of Irangi frog was capture 39Years ago. Since then, logging and habitat destruction and poaching can only be described by the relevant authorities.

understand the distribution of this species in the Kenyan highlands. This is what the project is all about!



It is here. In this forest at the South Eastern slope of Mt. Kenya. The place where the only living Irangi Frog was found. Now, it is an Endangered species in the IUCN Redlist. It's other populations in Kimande Forest are feared Extinct and its distribution range is not yet established.

*Photo Courtesy of Gold Kenya:
Credits, Anthony M. Karani*

The five miles that matter

The main objective of this project is to empower the community to carry out projects that lead to the conservation of the Irangi Frog and in the identified habitats.

The Following are the specific objectives:

1. To build the capacity of the local community with emphasis on education and dissemination of knowledge to the community, schools and publications.
2. To conduct field studies and Continuous research based behavioural studies and developmental issues of the amphibians to identify and build basis for the project.
3. To engage the community in innovative efforts to address the mitigation of the threats by setting up new breeding sites and in situ facilities.
4. To ensure adequate project management, Monitoring, evaluation, reporting and documentation, publication and dissemination of various project finding to enhance conservation knowledge of the local community and in the international domain.
5. To lay the foundation for further conservation efforts including establishment of an ex-situ facility (if necessary) for sustainability of these species.

The above objectives are most suitable because while these species are still being observed in the localities, it's upon the community to set up their own intrinsic measure to conserve the species and avoid Extinction.

Irangi Primary School is the immediate neighbor to the forest (in the background).

Many are positive about the irangi puddle frog and conservation of the environment. I have met people with a good heart who are both hospitable and welcoming and I believe this programme will help change many lives.

~ John Nyaga,
Mungania Tea Factory

The endangered story

How fast a species moves from threatened, endangered, critically endangered, extinct in the wild and extinct is a whole trailer. It depends on the ability of the local community to address the issue at hand. Irangi frog is no different, actually, it is a typical case, the real story.

When this project begun, not even the forest or the person who lives near the

forest gate knew about a frog within that forest that is endangered. The day to day work within the forest continued as usual as if nothing was really wrong. In fact, nothing was. This is evident because if anything was wrong really, then the tree harvesting season would have changed or the grass should have stopped growing or the gate leading to the forest would close,

Continued in Pg 6..



Our Irangi Frog

Our Smiles are smiles of accomplishment

Knowing that we have once again rescued a species and have made our supporters proud!

Will you be part of us next time?



" Is the story of the endangered! frog "

The endangered story (cont'd.. from pg. 5)

the firewood would shout at the women and say they won't be collected, the insects, snakes and bees would have restored their indigenous behavior of biting, the evergreen trees would now be ever red and the rivers would have stopped flowing. None of these has ever changed. The sky is always blue, the sun is always yellow and the orange is always orange; even

when its rotting from inside. Little knowledge is not always dangerous but 'Our species perish due to lack of knowledge'. Since then, it only demands a cherub to guard the gates of nature from you and me!

The Irangi Frog belongs to a less popular and less known group of animals, Amphibians (which include frogs, toads, salamanders and the lesser-known caecilians), are the most threatened vertebrates in the world. They are

in an especially dire situation, suffering the double jeopardy of exceptionally high levels of threat coupled with low levels of conservation effort. Over 6,200 species have been identified; of those 41% are at risk of extinction, almost half in decline and more than 100 species possibly extinct according to the IUCN Red List of Threatened Species™. Major threats include habitat loss and a fungus that causes chytridomycosis, an infectious disease.



13

The number of days the longest survey in the forest and community lasted.



Continuous surveys on the frog and field visits is the only way to get first hand information about the Irangi Frog. Guided by the community and with the community, the most suitable sites for the survey of the species were established and surveyed. With numerous minor surveys and specimen collection field visits, the greatest of this survey lasted 13 days and involved all the partners and research team.



720

The number of community members reached through open forums and meetings.



While there could be repetitions in this estimate because some people belong to various groups and associations educated, all efforts have been made to ensure that it represents in a holistic manner, the number of people who were empowered in forums and open meetings. The most successful were forums with CFAs, youth and women groups and farmer field schools at Mungania Tea Factory collection centers.

Habitat loss and others

Loss of habitat is probably the greatest threat facing the Irangi Frog species. This was evident from the long interactions with the community and the life within and around the forest. However, it is probably the least of these concerns too. It is just one of the greatest

and to address it, the root causes were addressed. Apart from the issues addressed, the utter lack of awareness and ignorance by the community coupled by poverty and developmental stereotypes was addressed. Before the habitat was lost, love for humanity was lost.



43

The number of gatekeepers in the community based conservation.



This is not just but a strategic move. There are resourceful people in every community and so in the Irangi community. They are both gatekeepers and whistle blowers and are equally influential. 20 of these people were trained as lead conservators of the Irangi puddle frog can not be described better. They are the most intelligent of this community.

But that is not all, there are women, the youth, the wise men and of course, the skilled and the noisiest of the Irangi forest!



Photo Courtesy of Gold Kenya:
Credits, Anthony M. Karani

Conservation force

This project started with innumerable number of surveys within the forest and around the community that have led to the understanding of the issues affecting the Irangi Puddle frog as well as lay foundation for the work at hand and the results have since acted as guides to the community and in the recommendations herein. These surveys were guided by and conducted with the community who also have the liberty to conduct similar surveys at their own discretion. Further to surveys, chatting

with the users of Irangi forest within the forest, around it and in the community is a major component that cannot be overlooked. Interviews and questionnaires were filled by random members of the community.

These surveys in the forest and within the community helped the researchers understand the context of P. Irangi Conservation.



These reeds are found within the settled areas a few meters from the forest. They are probably the only remaining bit and they are estimated to cover 2 acres of land. One of the community members quoted it as only 5% of the original size in his childhood.

Frog used to breed here but today, the amphibian population has greatly reduced. Maybe not for long; he says!

Very soon, it will also be turned into agricultural land.

The Children are the greatest bit of conservation because they have the psychology of the community and it is from it that they learn their future or influence the present. A frog is a small thing in nature, and nature as a whole is the child's greatest friend. Did the children know about the irangi puddle frog? The answer was no, the expectations were

Bringing back the conscious!

maybe but the reality has evolved into yes with the efforts of the project. What they do, they did not know, even when it was the thing that conserves the environment. This grant and its subsequent efforts was like building a city upon Conscious. A city built upon knowledge and strate-

gic planning. Working with the school and addressing those jovial children was always a task the researchers found joy in. The future of conservation of the endangered species in the long-term depends on the younger generation and their ability to use greener

"When I sing about Nikora's child frog (a tongue twister in Kiambu) I feel so happy."

**Mwendia,
Irangi Primary
School**

Continued in Pg 8..

methods to build their livelihoods. There are quite a number of schools near the forest. The most immediate is Irangi Primary school which has a population of 500 pupils. 30 of these were candidates at the time of the project began.

Bring back my conscious (cont'd.. from pg. 7)



“Each of the children was furnished with the information sheet about the irangi Puddle Frog. It was fun hearing them talk about it and even more fun seeing them play with the cards and make kites of them” The project team responded.



“When asked about the information in her card, she narrated it fresh. I actually thought she'd been revising that for her examinations. She now wants to become a wildlife researcher in future!” A Parent when she was asked about her daughter.



The number of household reached in community based conservation.

427

This is not just a good number. With a target of 400 hundred households living around the Irangi forest, a total of 427 was reached on the 14th day. A household consisted of a number of families although this varies largely. This training was made in association with Mungania Tea Factory who by the hierarchy of their collection centers and farmer field schools made the identification of these households easier and convenient. Because no single community is poor!



Every time the children asked the people who conserve frogs to take a snap of them, it's because, they knew how rich and resourceful their community is!

Trainings and Outreaches

7

The number of days the community training proceeded at Mungania Tea Factory.

A journey of a thousand miles starts from a single step. From the first day to the last day of equipping the gatekeepers with facts and asking them to join in the web of the community in the conservation of the Irangi Puddle frog. This begun at Mungania Tea Factory when a team of 16 men and women of influence within the community was assembled to the Irangi frog training. The staff members at the factory were not left behind, they too were trained. Some of them just to gain Knowledge and others to assist in manning the members of the community during the household training.



Continued in Pg 9..

Trainings and outreaches (cont'd.. from pg. 8)

Some of the issues targeted are the threats posed in the habitat of the Irangi frog by the agricultural community and the forest users. The training introduced the community to the conservation of ecological biodiversity (flora and fauna) including wildlife and forest resources. Further, there was need to emphasize on what the community does best and to this effect, there were several modules on sustainable agricultural practices, principles, soil conservation and integrated pest management. One of the issues affecting the community are the climate change, therefore, community based adaptation and mitigation was a major component. The manager of Yehuda Farms, a local enterprise located at Ena, a few miles from the forest presented a case of his thriving business and facilitated lessons on agriculture and enterprise development and sustainability from an environmentalist's perspective. While the researchers are experienced in Aldo Léopold's land ethics, a session on rights based community development: the rights of the human and the rights of nature

was the most interesting presentation. Demonstration of successful and potential case studies and showcasing of products was aimed at encouraging the community to think beyond the extraction and exploitation of resources and focus on sustainable forestry, natural capital and alternative land uses. The experience by the locals differs less from Rachel Carson's philosophy of, "What you do to the animals, you do it to yourselves", which was presented in sustainable consumption, production patterns and waste management practices. To sum it up, these trainings followed one simple maneuver, the journey to community based conservation and loss of biodiversity in the light of the Irangi Puddle Frog (*P. irangi*).

“There was need to emphasize on what the community does best and to this effect, there were several modules on sustainable agricultural practices”

The loss and destruction of the habitat where this frog lives is blamed largely on the community through their robust agricultural and forestry practices within and around the forest. This is a fact though, that is really hard to place before their faces without pointing an accusing finger.

In most instances, the activities are possibly 'the only way to the community livelihoods' until the hand of an experienced midwife. To this, Gold Kenya was, the pacesetter.



Photo Courtesy of Forester, Irangi Forest Station: Credits, Ndirangu

The miner who mines the miners

I'm happy that the community is listening and learning from us. In this, it is also a learning experience for me.

Catherine Kagendo,
Irangi Community

Listening to the story of Lilian Gataka is both touching and amazing. "I like being near this river, because every time I am here, I feel like I am conserving the puddle frog", she says. Gladys is the leader of a community based organiza-

tion called Irangi Puddle Frog Conservation Group that aims to among any other things undertake the conservation of this frog and build the capacity of other community members to do the same. She

believes that inviting other people to do the same is like mining others to be miners for the job will be done better. She is Right!





Mr. Galgallo presents one of the "Irangi Frog Cups" to Mr. Ndirangu, the Forester at Irangi Forest. The Kenya Forest Service was our greatest assistance within the forest. Sometimes, being in the forest is a nightmare.

Challenges in the journey

Working with the community is fun but it is not entirely easy because in most cases, their expectations are higher than the level of accomplishment while others are less educated and their level of comprehension is equally lower. However, our greatest of the challenges is that which we must not say, because poaching is illegal in this country. Indigenous knowledge of the community members can be trusted but whenever we found ourselves in loggerheads with

elephants and other wild animals, we seemed not to trust it much. Financial crisis was not the worst because, with the support from The Mohamed bin Zayed and cost sharing with the community and partners provided adequate result, though El Nino was only communicated on a short notice and to continue, the project requires more support.

Most of the times, we were working without against the malice of social contagion.

It is iron that sharpens iron. Actually it is the community that empowers the community; it is their own efforts that have conserved P. irangi.

Now; Listen to this!

There are good people who are concerned about this topic. The old people were more interested about the Irangi puddle frog. While it was difficult to introduce the topic, people have become interested in the conservation of Irangi puddle frog the more.

Jane, Trainer

Some of the farmers are hard to deal with but we are trying our best to explain to them about community based conservation of the Irangi puddle frog.

Anonymous or name not indicated

Iron sharpens iron

Amazing how information spreads within the community. Sometimes like the forest fire, other times even like a contagious disease. It is called the social contagion and it was the most important tool in the establishment of community based conservation project. In just less than a fortnight, everyone was aware about the Irangi frog. A story of large wings and many versions.



21

The number of frog ponds constructed by the farmers around Irangi forest.

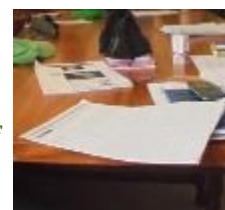
As an attempt to engage the community in innovative efforts to address the mitigation of the threats by setting up new breeding sites and in situ facilities, the community members were asked to setup small ponds to enhance the breeding of amphibians. Some of the farmers left one of the fish ponds unused to increase breeding sites for frogs. The small puddles near the streams were left undivert.



2310

The number of copies of P. Irangi fact sheets distributed to the community.

In an effort to build the capacity of the community and to disseminate knowledge of P. irangi over 2000 copies of fact sheets were given out to the members of the community. This includes but not limited to all the publications distributed in schools and materials given to farmers during the household outreaches. All the farmers who were involved in the trainings were furnished with these amazing facts.



WHERE IS THE IRANGI FROG



My name is Anthony and I am the Lead Investigator in the Community Based Conservation of the Irangi Puddle Frog. Since the first time I visited the Irangi forest, looking for a frog that has not been talked about for quite a long time, its story has only been amazing.



Will you support our work in species conservation?

As a conservationist with no stories except a brown croaking one, of a poor elderly creature believed to be somewhere near the rivers of an isolated forest at the periphery of a great mountain; a story of which the teller is not certain but can only vaguely cogitate, a story of survival for the fittest, a story of the weakest. In June 2015, my trip to the forest was all not in vain for a part from talking to the forester and the youths, I was met this old man (closer to my age, if you do not mind having the numbers inverted) and his resourcefulness is fascinatingly marvelous filled with candid substance of sense and utter wisdom. I believe in indigenous knowledge and every community I ever visited was idiosyncratically smart in the way they represented their knowing about various components of their natural environment. This old man's wit was peculiarly encouraging and motivated me to do the conservation work of the Irangi Puddle Frog.

The Diminutive Monster

We spent nearly an hour trying to identify the local names of the frog with the youth in the community but no sooner had the old man set his eye on a prototype photo of the frog, dating back 1977 than he made up his mind to a local name that frustrated the moods of the youth who had never heard of it. The common saying that an old man will see far sitting on a chair than a youth at the top of a tree closed my mind but I did not allow it to settle. "I am smarter than that!" I convinced myself once again, frustrat-

ed as ever before, sympathizing with my fellows but we forgave each other because the last time this frog was seen; probably some of us were barely here and now we can claim proficiency of anything.

The story now began. "This One!" he exclaimed vivaciously adding that it is a huge frog that can be found on the land as people do agriculture, which as far as I know is not true. "You see, it digs hole, it has nails (amusement) and it is not a good creature", he said as we all laughed especially because what has troubled us this much is a terrible monster. I only blamed myself for duping all these people into all this mess, a mess that only myself can clear now by proving otherwise. So why is this frog so bad? We all wondered shortly before our host introduced this topic by saying, "I am told its heart is not good", knowing so well that he is giving us a secret of the past. "Some people capture it, extract poison from it and harm others. (He paused) People all not that good; they are bad", he said, throwing peculiar looks at me.

Irangi forest station is decorated with numerous beehives and on closer scrutiny, I identified that nearly all the trees had hive flower. The old men are not known to give all the information and their secretiveness to indigenous comprehension is startling. So to get more information, I had to try another trick – the acquaintance ploy. Not so long, afterwards following my introduction that he told me of the last time he saw the frog; over twenty years ago but this time we got more than just information- Honey. The honey was more than sweet; pure rainforest honey of the mountain and we talked and chuckled over it as we masticated our best. Once again we appreciated the gift of nature and he said, "Honey is medicine, you see even the frog we talked about and its poison; we do not know more but poison is also a medicine" he concluded.

A hopping pharmacy

The frog just jumps and hops, hides in the mud and breeds in the water but there is one thing we do not talk about it. That although sometimes difficult to see and find, amphibians are beautiful animals – Very beautiful in deed. The father of American Literature Mark Twain – the greatest poets of all times will tell you that eat one live frog every day and your day will never be worse. But of course do not eat live frogs; conserve them and your future has never been as better. A frog or a salamander is a true jewel of the forest with their intriguing colors.

www.goldkenya.org/blog

To read this and more stories!

The amphibians are extremely sensitive barometers of environmental health and their disappearance would have dramatic consequences for species that share the same ecosystems -including people. They have permeable skins that makes them susceptible to changes in the environment, but also arms them with significant biomedical properties.

The old man was right, it is said that a painkiller isolated from the skin of a frog is 200 times more potent than morphine. If the residents of an isolated forested village many years ago could extract poison or medicine from a species that is critically endangered without scientific evidence; our modern society is either traditional or primitive. The date today, potential treatments for HIV and skin cancer have been isolated from the skin of amphibians. The importance of these creatures in the ecosystem is also equally significant. Amphibians regulate crop pests and vectors of disease such as malaria causing mosquito. The story of a dreary monster challenged me to think that if we do not act quickly, we risk losing many similar benefits before they are even

discovered.

But do we humans say? When we talk about sustainable development and about the future, looking at

the eyes behind our heads and hopping happily to call it our common future. Even when we have neglected the most important of all the creation; the least talked about. Apart from praising their incalculable role in human cultures, from classical literature to fairy tales, and the aesthetic worth of their bright colors and melodic calls; we have done nothing much to conserve the amphibians.

Today, we have been able to gather real facts about the Irangi frog and the community knows about it better than then. The community work and scientific research is ongoing with prospects of yielding good results. A story to come, a story we wish you were a part of. Will you be?

“ The old man was right, it is said that a painkiller isolated from the skin of a frog is 200 times more potent than morphine.”

The Amazing Fact!

Shocking; around my home, there is a retention ditch which holds rainwater and is wet almost throughout. Surprisingly I have no issues with mosquitoes. I now know frogs feed on mosquitoes.

**Espendita Kinyua, TESA
Mungania Tea Factory**

What we do to the animals, we do to ourselves!

Farmers were guided in establishing the issues affecting the amphibian populations in their farms. These included:-

1. Climate Change and global warming
2. Improper management of water systems and drainage of wetlands
3. Introduction of new or invasive species
4. Diversion or obstruction of water bodies
5. Use of agrochemicals including pesticides, herbicides, inorganic fertilizers
6. Improper waste management
7. Infectious diseases induced and spread by the farmers
8. Soil erosion and eutrophication of water bodies
9. Deforestation and overdependence on primary forest products like wood and charcoal
10. Lack of clear method on community based conservation of the amphibian species.

among others.

The Amazing Fact!

There are a wide range of misconceptions about the returns or benefits of conserving the frog. All the same, farmers were positive and are appreciating the need to conserve Irangi puddle frog.

**Njuguna
Supervisor**



Save our Species

My Name is Kiteme Syombua. I participated in the Survey in search of the Endangered Irangi Puddle Frog but I'm not so sad because I lost my way in this forest. Next time, I will need GPS navigator and I'm sure you love what we are doing.

Will you support our work?

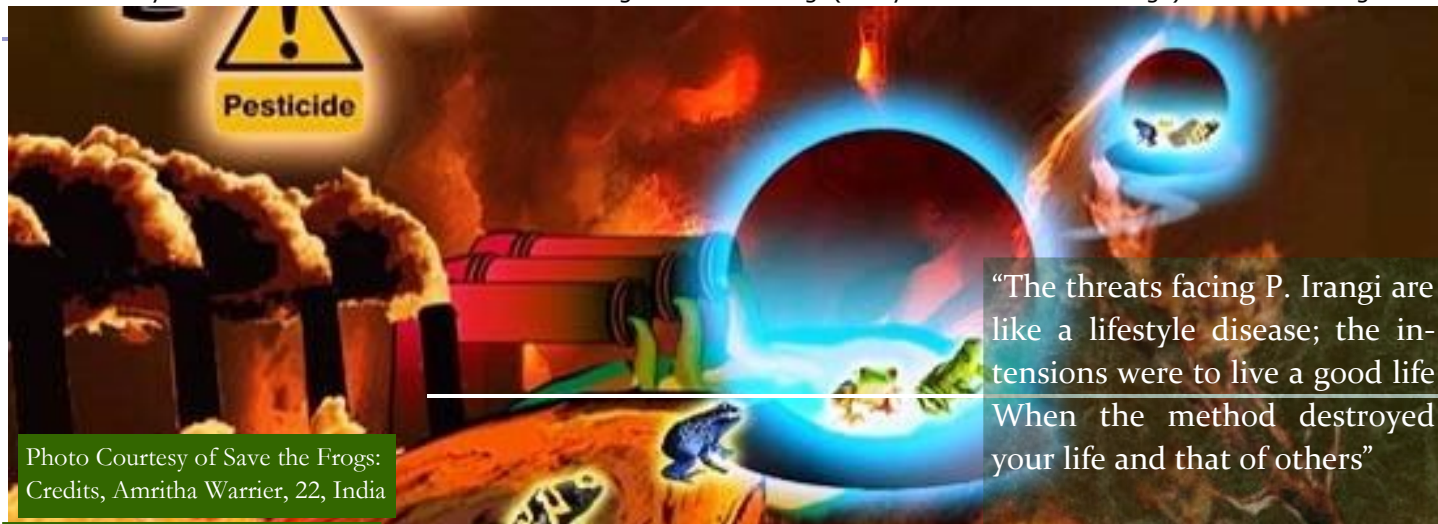


Photo Courtesy of Save the Frogs:
Credits, Amritha Warriar, 22, India

“The threats facing P. Irangi are like a lifestyle disease; the intensions were to live a good life When the method destroyed your life and that of others”

Findings and discussions

A huge number of issues surrounding the decline of amphibian conservation results to a similarly large number of improvement measures and research findings. With that said, the issue of a community based conservation, though entirely complex has many underlying pressures of equally great magnitude. It may not have been easy to note and recommend each one of them at this time especially in a community project with less of research work and strict objectives. Among the major outcomes is the research work with the community input and support where within the forest and the surrounding farms, the farmers assisted in identifying resolutions to control the decline of the amphibian populations in their farms. Quite a large number of observations, information and resolutions were reached at, some of which have been documented here.

Climate Change

Climate Change and global warming are some of the hottest issues in the international debate today and they, too, are a great debate in the Irangi community. It starts when a community member observes that there are no more frogs in their neighbourhood as there used to be when he was young. The other say that even the birds, too, and the other mentions all sorts of animals, tree species and weather patterns before all rise in one voice and agree the future is here, a future where climate has changed. Scientifically speaking, saying this better is worse than speaking in Greek, a language that no community member seems to grasp. However, all these are observation that cannot be disputed because even the greatest of scientist quotes them. Indigenous knowledge in the Irangi Community is still fresh, just as it was in the other century or at least it's not all gone. El Niño is now common in Irangi forest and it was at its peak during the research period. We stayed near the banks of small streams

where males had been found calling in October but none did call this time. Water was already overflowing in the puddles and small streams and the community members confess that it was higher than ever before. The breeding patterns of the Irangi frog, though not known have probably shifted with the climate change phenomena.

The causes of climate change were also identified by the community and majority of them were caused by the community. The included the continued dependence of the forest for fuel such as wood and charcoal. It was therefore recommended that there is need for the community to embrace the use of modern cook stoves, briquettes, solar light and modern kitchens. Further it was advised to reduce the number of polythene bags and plastics used within the households and at the same time use water tanks as a method of water harvesting. While climate change is a complex situation affecting not only the behaviour and habitat of the Irangi Frog, it does without

The Amazing Confession!

The local people keep on asking me the importance and the direct economic advantage of these frogs. They say there are no frogs in their rivers and would like to keep them in their farms. I keep telling them the facts and guiding them. Thanks for your puddle frog research, since it has expanded my knowledge on environmental conservation. Among the community members, I am the first to conserve the Irangi puddle frog.

Samuel Nthanju
Irangi Community

doubt a major threat to the community members as well. The threats indicated by the endangered Irangi Frog are similar threats that would follow the community members and it was therefore recommended that for a holistic community based conservation, the members should strive to engage in personal and family insurance covers like the National Health Insurance Fund and pensions like the National Social Security Fund. Being members of Mungania Tea Factory, many have subscribed to Kinga ya Mkulima (KYM) translated as The Farmers Insurance, which is a product of Kenya Tea Development Authority (KTDA).

Wetland Management

The comfort of living near a tropical forest is tempting. This is no different in the Irangi Community which is in the Upper Tana Catchment region. While we understand that Tana River feeds over 15 Counties in Kenya and produces 60% of Kenya's hydropower energy, the issues that would threaten this reputation are the issues that have threaten the Irangi Frog. Notably, though not pointing a finger of blame over the community which is now doing a lot in the conservation of an endangered amphibians species, the rivers bed have greatly changed their course and the habitats of these species were once diverse and reputable. Today, the small marshes around these rivers have been replaced with vegetables, cereals and vegetables. The river takes a new course every day because, small streams can easily be manipulated to the farmer's shape and taste. The era when the male irangi frogs were found calling at the banks of small streams is getting a new king. The king of absence.

Agriculture is the backbone of Kenya's economy and has another reputation as the disectomy of Kenya's backbone. It is from this activity that most people will gain livelihood and establish thriving households and it is from this that our biological diversity will see it ways below the international thresholds. This may not be manifest as many species are widespread across a wide range of habitat but for the Irangi Frog, it is confined to a small area and with the rapid modification of its habitat, settlement and extension of agricultural fields, the species has a short life on the face of the earth. Obstruction of water from the streams, drainage of wetlands and diversion of water bodies is a sign of improper management of water systems.

Planting of indigenous trees along the river banks could be beneficial to the survival of *P. irangi* and other amphibian species. However, the community around irangi forest have for decades preferred the exotic species along the

river banks which according to some of the members, though, facing great criticism from civil societies and lead agencies, have great financial motivations. It was further recommended that as a way to rejuvenate the populations of the amphibian species, the members of the community should construct frog ponds within their farms. To provide a great environment for the amphibians, it was necessitated to restore the wetlands, plant native reeds on the banks of small streams and avoid planting water draining trees along the river banks and wetlands.

Diversion or obstruction of water bodies is continuing at an alarming rate and while there other legal ways of controlling it, a community based mechanism such as encouraging the farmers to reduce the amount of water use in agricultural practices and restoring the original state of the river by reducing the unnecessary obstructions was encouraged during and after this process.

Invasive Species

A large number of frogs are killed, though not eaten by cats. Having been in Irangi Forest for many months now, we would have reported that there are wild cats in this forest. No, they are not there. The cats that would kill frogs in this area come from one place, the community. On your first entry into the forest, it is inevitably notable that a foreigner was here before you. A foreigner who eats mangoes and a foreigner who plants mangoes. It is not about mango trees but about an indigenous forest that has all signs of introduction of tree species that were once native in India, America or Europe. The situation is worse in the habited community land and forested parts that were once delegated to the community as newly assigned plantations.

Introduction of new or invasive species has closely been associated with the spread of diseases affecting the amphibian species like the deadly chitridiomycosis fungus. However, there are other species that do not directly affect the amphibians but have indirect consequences on the environment and the ecosystem. They include both plants and animals. The community adopted methods such as reducing or eliminating genetically modified crops, planting indigenous crops and replacing ornamental fences with local herbs as number priority steps towards reducing invasive plant species. While the farmers in the irangi community do not import amphibian species, it is only important that they control the number of pets they keep within the households and also handle with care fingerlings of fish transported

“ A large number of frogs are killed, though not eaten by cats. “

from other hatcheries.

Infectious Diseases

In Kenya, chytridiomycosis; an infectious disease responsible for amphibian population declines and extinctions on multiple continents was first discovered in 1998. The most plausible driver for the intercontinental spread of this deadly fungus is the human-mediated transport of infected amphibians. While it cannot easily be eradicated from affected sites in the wild such as areas habited by the Irangi Frog, the fungus spreads rapidly and is now globally ubiquitous. In one of the farms in the Irangi Community, inspected by the research team, a large population of the African Clawed Frog *Xenopus laevis* was found in three of the fish ponds owned by a community member. While such populations were not found in any of the ponds in the other households, it was thus concluded that, while this is habitable and native for *X. laevis* there is possible transportation of the highly adaptive frog to these ponds. It was further concluded that probably the eggs or tadpoles of this frog were carried together with fingerlings bought at the hatchery.

So why was this a concern, really? Notably, *X. laevis* and other clawed frogs of the genus *Xenopus* are highly adaptive to a wide range of environments and have been used in many scientific researches. The frog is known for its three tiny black claws on the rear foot, its tiny head and streamlined ovular body. It has low vision, lives almost entirely in water and is a scavenger that feeds on almost everything that comes its way. This will include fingerlings, tadpoles, eggs and worms, living, dead or decaying. Upon examination, the frogs were infected by the monogenean *Protopolystoma xenopodis*, a parasite of the urinary bladder. Though, the parasite does not affect the *P. irangi* specifically, this endangered species and its eggs or tadpoles may not escape the threat of *X. laevis*. If this frog found its way into the habitats of *P. irangi* or is introduced further into the area, the subsequent erosion of biodiversity, not only of amphibians, but of a wide array of taxa: will inevitably lead to competition and when coupled with the spread of novel pathogens will be followed by numerous extinctions. Further, it is notable that use of chemicals may lead into introduction of unhealthy substances into the ecosystem while some encourage growth of pathogens and or death of symbiotic bacteria within the ecosystem. Therefore, the community is encouraged to disinfect their shoes and clothing after contact with chemicals and at the same time wash their hands regularly with soap. Further, it is important to check thoroughly on other species such as fish purchase from hatcheries far away to avoid buying

along other animal species and to avoid stagnant water within the households such as unprotected pools and basins.



AGRICULTURE

OUR ENEMY'S BEST FRIEND

Agriculture is the backbone of Kenya's economy and has another reputation as the dissection of Kenya's backbone. It is from this activity that most people will gain livelihood and establish thriving households and it is from this that our biological diversity will see it ways below the international thresholds.

Soil Erosion

Soil erosion and eutrophication of water bodies was established as a major concern leads to the decline of the amphibian populations. While the Irangi Frog is a puddle frog, the decline of puddles in its habitat can be blamed for its decline too. Use of inorganic fertilizer and other substances that add unwarranted nutrients into the ecosystem

“This exposure to pesticides, though not studied, could be another driver for the observed decline of *P. irangi* and other amphibians in the locality.

may lead to changes on energy and diet composition in the ecosystem which affects the behaviour and adaptation of the amphibians. The community members build gabions along galleys and use of contour farming and plant cover crops on the farm and along river banks.

Agrochemicals

Agrochemicals have observed effects on both the terrestrial and the aquatic life forms of the amphibians. Irangi community is a farming community including livestock, fisheries and horticulture. While small scale tea farming is the largest method of community livelihoods, other crops received equally high attention and are characterized with high chemical inputs to control pests, weeds and fungal infections. This exposure to pesticides, though not studied, could be another driver for the observed decline of *P. irangi* and other amphibians in the locality. The skin of amphibians is highly permeable to allow gas, water, and electrolyte exchange with the environment and therefore, introduction of agrochemical has inevitable negative effects. While further studies are ongoing to rate the dermal uptake of chemicals by *P. irangi*, its magnitude is undeniably faster as its life in the crop fields might represent a likely exposure route. It is also hypothesized that *P. irangi* breeds in rivers and small streams and its exposure to toxicants in these two environments pose double risk. The intentions of the farmer is not always negative but the terrestrial *P. irangi* frog may contact the toxicants by direct exposure while the aquatic form receive pesticide inputs where minute amounts enter water bodies by spray drift or run-off in un-intended pollution events.

The community has employed various ways to control the use of agrochemicals which includes the commonly used pesticides, herbicides, organic and inorganic fertilizers and other toxicants. The immediate recommendations were to construct a special vessel or establish a room for the storage of agrochemicals and avoid spraying near the water sources or the banks of a river. Further, the use of protective gears during the application of chemicals and fertilizers, attempts to reduce the quantity or frequency of use of agrochemicals and inorganic fertilizers as well as to avoid spraying during the rainy season, when the weather is rainy or windy are a great weapon in the conservation of *P. irangi* from agrochemicals and other toxicants.

Waste Management

While the local community have low levels of wastes within the households that would have direct impact on *P. irangi* and the ecosystem, there is still importance for proper waste management. The households now use waste segregation mechanisms for recycle, reuse and composting. They also treat domestic water through natural filtering before release into the river and also avoid burning of agricultural wastes including materials like polythene and plastic. The researchers and the lead farmers have assisted greatly in creating awareness for the best waste management practices.

Deforestation

Deforestation and overdependence on primary forest products like wood and charcoal as a standalone issue has weight and if properly addressed by the community would have a greater impact in the conservation of the Irangi Frog. It is followed with recommendations that the households have embraced by setting up portions for trees, planting trees on the boundaries of farm portions and exploring alternative forest land uses like ecotourism, apiculture among others.

Community Effort

There are many issues surrounding the conservation of the Irangi frog and with no published accounts of studies that have successfully facilitated amphibians' evolved resistance to diseases and rapid genetic modifications of their morphology to adapt to immediate environmental pressures. It can, therefore be assumed that no such protocols will be imminently developed that can protect the world's amphibian populations in the short-term. This requires a combined effort by the researchers, the government and the communities to lay down conservation measures for the long-term. As a method of establishing a holistic community based conservation project for the amphibian species the households have resolved a wide range of conservation plans.

First, through the community forest association (CFA) which involves members individually or in groups who are identified as the forest users in the management and utilization of the forest resources. Majority of the families in the Irangi Community are members of the CFA and many others are enrolling. The members of the community were encouraged to keep a detailed record of the farms such as inputs, outputs and the profits. This would enhance the tracking of introduction of chemicals and substances into the environment and for monitoring by the community. The formation and registration of new youth, women groups and community based organization such as the Irangi Frog

Conservation Group and incorporation of environmental conservation in the mandates of local association was a major milestone for the project.



Further Actions

This project is still ongoing and more frog ponds and In Situ facilities are ongoing. The community proceeds in their conservation efforts while research and the foundation report for the establishment of an Ex Situ facility is underway. With the continued community efforts as of now, the establishment of an Ex Situ facility is may be necessary but continued studies may prove add more to this information. The researchers have identified research topic in the line of the conservation of the Irangi Frog and shall be working on fact findings with the community as well as offering guidance and support to the already laid foundation.

Conclusions

P. irangi and by extension many amphibians represent the principal model of the crisis in modern biodiversity because apart from being the most threatened and rapidly declining vertebrate group, they are disappearing from their habitats on a global scale. *P. irangi* not only serves to show how, propose mechanisms to address the issues but through the community based conservation of the frog gives an outright success story. Only when the problem is addressed from the root that it is mitigated sustainably and only when the people who matter work together in addressing the issues surrounding species conservation such as competition with alien species, increased ultraviolet radiation, global warming, emerging infectious diseases, habitat loss due to land use changes and pollution and other potential stressors that the mammoth of loss of biodiversity shall get extinct. There is hope for *P. irangi* with reduced clearing and conversion of grasslands, wetlands and forests and the ongoing measures that encourage coexistence and transform agricultural areas a biome that is an essential habitat for amphibians.

The funny bits

Every story has funny bits, even this of community project. The first one is a child who demanded to know if we (the research team) are hunting frogs for food (the community found it funny because frogs are not eaten here in Kenya). The community members shied off reciting a proverb in their language that says, “*Mwigerekanio watere ciura matina!*” translated as ‘*Mimicry caused the frogs to loose their bowels*’ when it was explained that maybe their ancestors believed that the frogs do not defecate. Mimicry in this proverb referred to the competition when males make the advertisement calls. The funniest is the frog dance innovated by one of the community members and you can catch a view of it on our YouTube channel.

This reminds the story of two frogs of Japan: the one from Kyoto, a flowing stream near the city of Kyoto and the other from a swamp in Osaka City. The two travelled long distances to see the beauty of each other’s town and when they met the route became easier because they lifted each other and could see the cities well. Each went home after saying, “Your city looks exactly like the city I call home and there seems no point in traveling all the way down the mountain just to see a city so very like my own,”

But the frogs forgot one thing; that their eyes are somewhere behind the head and what they saw was nothing different from the city they came from.



We explained the Irangi Frog is wiser! **

SAVE OUR SPECIES




Hello, I am Moses O. Wandera!

“I have not been this close to Mt. Kenya before. This is a sign of accomplishment, success working with the team in the community based conservation of the Irangi Puddle Frog, saving a montane species. We have once again achieved what we are good at and it was a great honor for me and to our supporters”

Will you support our work in species conservation?

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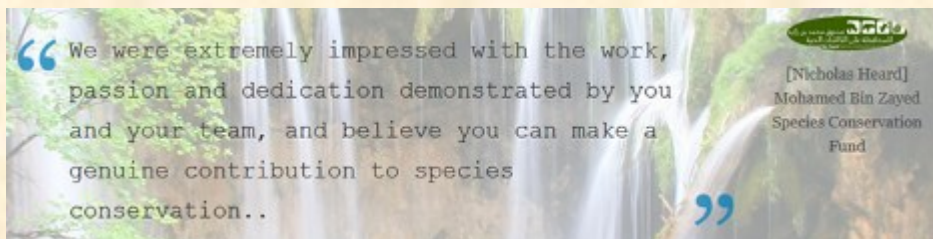
Additional Information

Supplementary information accompanies this paper at <http://www.goldkenya.org> or Search the Mohamed bin Zayed Species Conservation Fund Project number **150510729** from <http://www.speciesconservation.org>

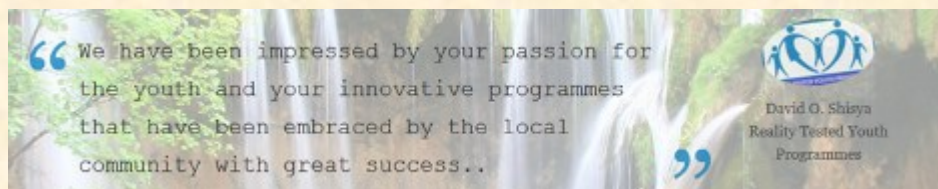
How to cite: Karani, A. M., Golompo, G. G. & Wambui, A. W., 2016. Community Based Conservation of the Irangi Puddle Frog (*P. irangi*). Nairobi. Unpublished.

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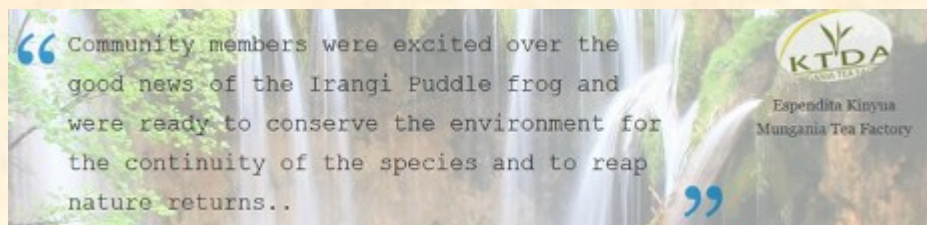
And the philosophers will tell you If this is true



And this is true



Then this is true



Who defies logic?

The members of the Irangi Community call me Mr. Frog (also means 'the father of the frog' in their vernacular) and kept telling me to say hi to the Irangi frog every time we walked into the forest. I used to remind them the father of the frog was supported by The Mohamed Bin Zayed Species Conservation Fund.

~ Anthony M. Karani, Lead Investigator

Very Encouraging People!

Your organization is up to standards, with discipline and motivation. On behalf of the trainers and the Irangi Community we congratulate the researchers and the entire organization. We appreciate your supporters and ask blessings for those willing to support you even further.

Rachael Maragua

Very Committed People!

The Community is interested in the conservation of the Irangi Puddle Frog and are willing to participate

Dominic Mwaniki

People are apparently willing. We left a good mark.

Amos Ndwiga Munyi

Now, it's time back to the woods, and the puddles!



Green Operations in Leadership & Development (Gold Kenya)

MARK MY WORDS!

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THE MOHAMED BIN ZAYED SPECIES CONSERVATION FUND PROVIDED A SEED GRANT FOR THE ESTABLISHMENT OF THE LARGEST COMMUNITY BASED CONSERVATION PROJECT IN EMBU COUNTY, LOCATED 150KM NORTH OF NAIROBI CITY, KENYA.



To support our work:
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He empowers the community everyday, everywhere. Galgalo is not the noisiest of them all young conservationists; but your support and donation is what is. The most convincing effort in Species Conservation!

The Success Story

Is a story that starts at you, follows with me, proceeds with they and ends at us. The story of a collective effort, the story of growing together. This story is. A story of \$4886 from Mohamed Bin Zayed species Conservation fund, a story of young conservationists and researchers from Gold Kenya, of the tireless commitments and resources from the community, of splendid partnerships with the local community, associations, institutions, youth and women groups, the community for-

est associations and individuals who worked together to respond in the conservation of the Irangi Puddle Frog.

Just another day it was endangered, maybe one day it would be extinct.

Today, it's status is improving, maybe one day it will be thriving in abundance again. This day is the day we all should live to see.

The other day we need you to be part of this story and to support such a noble cause. Let it be a day we will all live to see.

"Because sustainability is the sweetest bit of every great story!"