

Deworming Program In Low-Income Nicaraguan School

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Abstract

Infection of soil-transmitted helminths (STH), commonly referred to as intestinal worms, are estimated to plague over 1.5 billion of the world's most impoverished communities [1]. Developing countries bear the largest burden of STH infections due to lack of access to clean water, safe housing, sanitation infrastructure, education and healthcare [2]. In 2017, Dr Dirk Engels, Director of WHO's Neglected Tropical Diseases department, stated, **"There is now global consensus that periodic, large-scale deworming is the best way to reduce the suffering caused by intestinal worms,"** [3]. In addition, numerous studies have shown significant efficacy particularly among school-based deworming interventions.

Therefore, in order to best steward the health and wellbeing of their students, as well as to comply with the WHO's recommendations, the Granada Christian Education Center (GCEC) — a primary school located in one of the poorest areas of Nicaragua — is **requesting \$1000 in funding to establish a school-based deworming program among their growing student body.**

Overview of Organization

The Granada Christian Education Center (GCEC) preschool and elementary school in one of the most impoverished and under-resourced neighborhoods in Nicaragua. Many of the homes do not have clean water and are make-shift shacks constructed with metal sheets and dirt floors. In addition, the local public-school system is overcrowded and under-resourced. Therefore, the GCEC seeks to break this ongoing cycle of poverty by equipping the local youth through education and empowering them to create change. The school currently serves 150 children, aged 3 through 12 years old. Each year the school builds a new classroom; by 2027 the school plans to offer education through 12th grade.

Needs Assessment

STH infections can result in diarrhea, abdominal pain, malnutrition, vitamin deficiency, anemia, and impaired physical and cognitive development [1, 4].

Complications from STH infections, such as intestinal obstruction, can be life threatening, particularly for younger children [2]. Therefore, treatment and prevention of STHs is particularly important for young children, as the WHO claims that "treating children infected with intestinal worms is one of the simplest and most cost-effective ways to improve their health" [5].

Intestinal parasites were named as **among the leading causes of death and disease** in Nicaraguan children under five years of age [6]. Furthermore, surveys conducted by the Ministry of Health in Nicaragua (MINSa) have reported estimated prevalence of STH infections as high as 84% in some areas [2, 7]. Although nationwide deworming interventions are noted by MINSa to have been taking place in Nicaragua since 2007 [2], local health professionals and families in the neighborhood of Pantanal have reported that deworming has not been occurring in local public schools.

School-Based Deworming Program

The GCEC would like to use the WASHED strategy to establish a comprehensive, school-based deworming program among their growing student body.

Water Access The school currently provides clean running water on school grounds via a solar powered well & safe drinking water in every classroom.

Sanitation The school also has sanitation infrastructure (i.e. sanitary latrines).

Hygiene Education The school also has a hygiene education curriculum which includes units on hand-washing, toothbrushing, and healthy eating.

Deworming GCEC will administer a chewable 500mg mebendazole tablet to every student in the school in 6-month intervals beginning January 2021.

Outcomes & Evaluation

Short-Term Outcomes:

- **Reduced STH infections** among the GCEC student body (measured by stool samples collected from students and tested for STH infection before the initial deworming treatment and 6 months following treatment)
- **Reduced school absenteeism** due to sickness (measured by attendance sheet data)
- **Improved physical development** (measured by height, and weight recorded annually)
- **Improved cognitive development** (measured by school performance via semester grades)

Long-Term Outcomes:

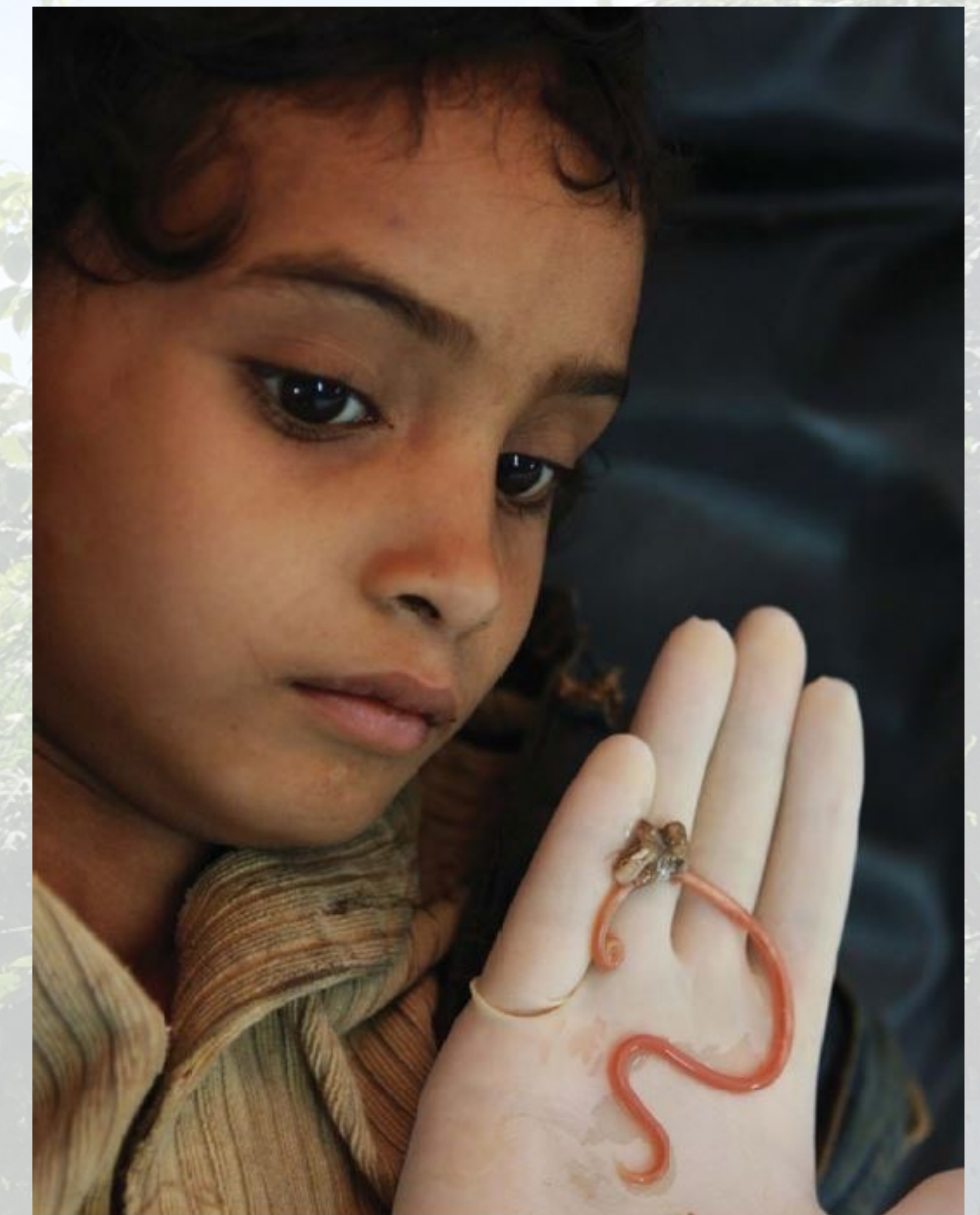
- Reduced STH infection for non treated family and community members [8]
- Graduation of healthier, smarter students as future community leaders

Timeline & Budget

The first year will involve the administration of two doses of mebendazole in 6-month intervals to all students and staff of GCEC. It will cost \$1000 to fund, including teacher training, hygiene education, deworming treatment, and program evaluation [5].

TABLE 2 Timeline for GCEC Deworming Intervention - Year 1 (2021)	
Task	Deadline (Week of)
Develop Training Materials	Dec 1, 2020
Develop Education Materials	Dec 1, 2020
Parent's Meeting & Obtain Consent	Jan 18, 2021
Teacher Training	Jan 18, 2021
Data Collection #1	Jan 18, 2021
Deworming Intervention #1	Jan 25, 2021
Data Collection #2	July 26, 2021
Deworming Intervention #2	Aug 2, 2021

TABLE 1 Budget for GCEC Deworming Intervention - Year 1 (2021)		
Component	Item Description	Cost (in US\$)
Teacher Training	Health Professional	\$100
	Training Materials	\$100
	Food	\$100
Hygiene Education	Print Teacher Manuals	\$20
	Teaching Materials	\$300
Deworming Treatment	Mebendazole - 500mg (400 tablets) *sold in units of 200	\$20
	Transportation to School	None
	Administration	None
Program Evaluation	Collection of Stool Samples (300 samples) *100mL plastic containers with lids	\$40
	Transportation of Samples	None
	Laboratory Analysis Services	\$200
Other	Miscellaneous Costs	\$120
TOTAL		\$1000



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