Climate Change Concerns of Youth in Cambodia: The Effects of Climate Change Communication and Collective Action

SONJA HAMMER | DIVISION OF RISK MANAGEMENT AND SOCIETAL SAFETY | LTH | LUND UNIVERSITY, SWEDEN

Climate Change Concerns of Youth in Cambodia: The Effects of Climate Change Communication and Collective Action

Master's Thesis by
Sonja Hammer

Lund 2024

Climate Change Concerns of Youth in Cambodia: The Effects of Climate Change Communication and Collective Action

Sonja Hammer

Number of pages: 72
Word count: 13.693
Illustrations: 11

Keywords
Climate change, climate change concerns, risk perception, climate change communication, collective action, knowledge, youth, empowerment, Cambodia

Abstract
Youth's climate change awareness is rising, but so are their concerns about the future, with climate anxiety being common in young adults and adolescents. Engaging adolescents in climate action is considered one strategy to mitigate these concerns but for them to become active they need to be aware of the issue. This research aims to answer if an increase in knowledge affects the climate change concerns the youth have and if participation in collective action helps in dealing with these concerns. It took place in a project by barnfonden and ChildFund Cambodia in Cambodia. An explanatory mixed methods approach was used by conducting a quantitative pre/post survey followed by one focus group discussion. The results showed a significant increase in the knowledge and belief in action but no significant increase in concerns and perceived personal affectedness due to the training. This could be due to various other factors influencing concern next to knowledge which led to an already high concern level in the first survey round. The increase in the belief that action can help deal with emotions and combat climate change indicates it to be a useful coping tool. The findings of this study show the complexity of climate change concerns and accentuate the importance of well-thought-through training when talking about climate change.

Riskhantering och samhällssäkerhet
Lunds tekniska högskola
Lunds universitet
Box 118
221 00 Lund

http://www.risk.lth.se

Telefon: 046 - 222 73 60

Acknowledgements

First of all, I want to thank my supervisor Misse Wester for her support and advice throughout this thesis. Thank you for all your comments and discussions and for making this a great learning experience.

A huge thanks to barnfonden and ChildFund Cambodia, specifically to Catherine and Shona as well as Dina, Sivuthin, and Sokunthea who made this research possible for me! Thank you for believing in this research and all the time you put into supporting me by giving feedback and translating and facilitating this research. Thank you for giving me this opportunity.

I also want to especially thank the youth in the Youth-Led Climate Action Project who took the time to fill out my surveys and participate in the focus group discussion. Thank you for sharing and trusting me with your opinions.

Lastly, I want to thank my fellow DRMCCA students, especially Anni, Sarah, Hannah, Tom, and Thijs. Thank you for your friendship and support during this thesis process, it would not have been the same without you guys.

Division of Risk Management and Societal Safety
Faculty of Engineering
Lund University
P.O. Box 118
SE-221 00 Lund
Sweden

http://www.risk.lth.se

Telephone: +46 46 222 73 60

Summary

Climate change is an existential crisis for humankind, while awareness is rising, so are concerns of youth about their future with climate anxiety being most common in young adults and adolescents. Engaging adolescents in climate action is considered one strategy to mitigate these concerns but for youth to take action they need to be aware and simultaneously not be overwhelmed by the issue. The research aims to answer if an increase in knowledge after a climate change workshop affects the climate change concerns the youth have and if participation in collective action helps in dealing with their concerns. The project background for this thesis is a project in the Kampong Trabaek district in the Prey Veng province in Cambodia by barnfonden and ChildFund Cambodia.

An explanatory mixed methods approach was used by conducting a quantitative pre/post survey followed by one focus group discussion. The survey offered the possibility of measuring their climate change knowledge and understanding, their perceived personal affectedness and climate change concerns as well as their belief in collective action as a coping tool before and after the training. The focus group gave background information on survey results as well as more in-depth information on the project and was facilitated by ChildFund Cambodia.

The results showed a significant increase in climate change knowledge and understanding and belief in action of the youth, but no significant increase in perceived personal affectedness and concern. Comparing perceived personal affectedness with general concerns, a difference was seen between concerns about climate change affecting one personally or society at large. A significant moderate positive correlation between climate change knowledge and understanding and concerns was found for the post-survey.

The non-significant increase in concern suggests that knowledge does not affect concerns even though knowledge significantly increased due to the training. However, in the focus group discussion and some survey responses, an increase in concerns was seen, which fits with the positive correlation of knowledge and concern for the post-survey. An explanation for these findings is that the various other factors influencing concern, such as perceived personal affectedness, values or political views led to a high concern level in the first survey round making knowledge only a minor influence overall. This was in line with the high perceived personal affectedness score in the pre-survey and no significant increase due to the training. It is further

corroborated by almost half the youth stating in the first survey round that Cambodia is already feeling the effects of climate change. The increase in the belief that action can help deal with emotions and combat climate change indicates it to be a useful coping tool. However, studies found a long-term negative effect on well-being if this is the only coping mechanism used by youth.

The findings of this study show the complexity of climate change concerns and accentuate the importance of well-thought-through training when talking about climate change. Applicability is limited to similar contexts and projects but can be used as background information when drafting climate change training. More research and comparative studies are needed especially in similar geographical contexts.

Table of contents

List of Figures

List of Tables

List of Abbreviations

AVE Average Variance Extracted

Mdn Median

Q Question

YLCA Youth-led climate action

1. Introduction

Climate change is an existential crisis for humankind (Marks et al., 2023) and will impact every layer of society (Helldén et al., 2021). Although the entire world is feeling its consequences, there are vast differences in the extent, with the ones causing climate change being the least affected (Sanson et al., 2019). This reflects a divide between the Global North and South and socio-economic factors but also by age, as vulnerable populations such as children are threatened the most by climate change and their health and overall well-being are at risk (Helldén et al., 2021). Global South and North as a concept focuses on geopolitical power rather than developmental or cultural differences and broadly includes Latin America, Asia, Africa and Oceania (Dados & Connell, 2012).

Especially young people are thus facing a future full of uncertainty and potential challenges which is why next to their climate change awareness, their concerns are rising (Kessler, 2021). This can be seen in various studies in the last decades that show a rise in climate change concerns and worry (Harker-Schuch et al., 2021; Hickman, 2020; Hickman et al., 2021; Murray et al., 2023; Ojala et al., 2021; Uba et al., 2023). Climate anxiety is most common in young adults and adolescents (Daeninck et al., 2023). In a global study, Hickman et al. (2021) showed that climate change has negative effects on the mental health of youth worldwide with 67% feeling afraid and sad and 75% feeling frightened of the future. Youth from poorer countries as well as those most exposed to climate change expressed the most concerns (Hickman et al., 2021).

Engaging youth with the topic as well as activities are important tools to make youth feel less overwhelmed (Bessaha et al., 2022) as they feel more hopeful and in control when feeling like they can do something to combat climate change (Gunasiri et al., 2022; Kolenatý et al., 2022). This empowerment can lower stress levels, improve well-being and build resilience (Bessaha et al., 2022). Engaging and supporting youth in becoming active in their community to mitigate climate change is thus an important factor in improving their mental health (Oswald & Langmaid, 2022), especially since not all youth have the resources and motivation to become active by themselves (Kessler, 2021). To engage youth, their risk perception towards climate change needs to be high (Dong et al., 2023), which can be achieved by increasing their knowledge and trust in

schools and organisations (Kessler, 2021). However, when educating youth about climate change, creating hope should be central to not make them feel powerless (Wang & Chen, 2022).

1.1. Purpose and Research Questions

Climate change concerns of youth are a relatively new research topic which has only received attention in the last ten years (Kessler, 2021). Due to this, there is a lack of studies and findings from the Global South, hence more research in these areas is needed (Charlson et al., 2022). Thus, this research, conducted with youth in a project by Barnfonden and ChildFund Cambodia in Cambodia, looks at the effects of climate change training and whether participation positively impacts youth. The purpose is to understand the influence of climate change knowledge and action on the youth's concern levels. The hypothesis based on the existing literature is that learning more about climate change will lead to an increase in climate change concerns but that participating in activities that try to combat climate change helps with dealing with these emotions. The research questions are the following:

1. Does the increase in knowledge affect the climate change concerns the youth in the project have?
2. Does participation in collective action help in dealing with youth's climate change concerns?

1.2. Project Background

The opportunity for the research for this thesis was given by barnfonden, a Swedish child rights organisation. They have a project with ChildFund Cambodia in the Kampong Trabaek district in the Prey Veng province in Cambodia (ChildFund Cambodia, 2023). Cambodia is a high-risk country regarding natural hazards such as floods, storms and droughts (Rouhiainen & Haanpää, 2023). At the same time, concerns regarding climate change have been understudied and knowledge about climate change is low (Rouhiainen & Haanpää, 2023). Prey Veng province is a rural and densely populated region with good accessibility from the capital. It can be seen as a quite accurate representation of Cambodian demographic and geographic attributes (Preux et al., 2011). Around 80% of the population are farmers dependent on the Mekong River (Sok et al.,

2011) making them more susceptible to climate change. The project about youth-led climate action (YLCA) supports adolescents who are in secondary school or out-of-school, in three villages to combat climate change, prepare for disasters and empower them. In the project, 75 youth group members receive training on social-emotional learning, disaster preparedness and climate change. They then organise projects with other youths in their village to prepare for disasters and participate in decision-making (ChildFund Cambodia, 2023). The project started in December 2023.

The training modules follow the climate-resilient development approach which has the goal to inform (knowledge on climate change and its impacts), to act (engagement in actions and advocacy) and to prepare (resiliency and creating opportunities for the future) (barnfonden, 2023). First system knowledge was generated by explaining to the youth what climate change is, what it entails and how it is becoming a problem. Further information was shared about what is currently being done worldwide to combat climate change such as the Paris Agreement and companies and nations setting goals. The training talked about Cambodia's plans to combat climate change and what role youth can play in it. The second part focused on disaster risk reduction and climate change adaptation. It entailed an explanation of the concepts, how Cambodia is affected by disasters, and included case examples and how disaster risk reduction and climate change adaptation could look like. The third part was about action and effectiveness knowledge, where the youth learned about their rights according to the United Nations Convention on the Rights of the Child and what advocacy work is. They discussed the benefits of action and advocacy and what the youths can do to create change. The last part of the training focused on the potential emotional reactions youth can have due to climate change and what tools exist to cope with it, such as connecting with others or becoming active. The training was interactive with youth discussing cases themselves and participating in group work. It also tried to emphasise hope and actions youth can take to not create an atmosphere of overwhelmedness.

2. Concept and Theory

2.1. Climate Change Concern and Climate Change Risk Perception

Climate change can be defined as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods” (United Nations, 1992, p. 7). In environmental psychology, concern means worry, perceived risk or seriousness (Rouhiainen & Haanpää, 2023). Thus, climate change concern can be defined as a feeling of worry and of being at risk due to the changing climate and the effects of this. Climate change concern is influenced by individual and contextual attributes, such as trust in institutions or knowledge about the topic (Kessler, 2021) as well as personal feelings toward it (Dong et al., 2023). Climate change concern is one way of measuring climate change risk perception as climate change risk perception indicates how concerned someone is about the effects of climate change (Han et al., 2022; van der Linden, 2017).

Climate change risk perception is a mix of cognitive and emotional impulses, it thus has an objective (the risk itself) and subjective (the feeling of being at risk) element to it (Dong et al., 2023; Han et al., 2022). A low-risk perception often means a low willingness to become active in preventing the risk, making a high-risk perception central to getting people to combat climate change (Spence et al., 2011; van der Linden, 2015). People who are ideologically motivated to engage with the climate crisis are less likely to downplay climate change risk perception (Luís et al., 2018). This shows that one's worldview also influences climate change risk perception as it is a good predictor of a likely change in attitude or behaviour (Harker-Schuch et al., 2021). Sociodemographic characteristics such as age, gender, education, and political views as well as values, culture and biases thus also influence perception (Hornsey et al., 2016; Kessler, 2021; Uba et al., 2023; van der Linden, 2017). For gender influences varying results have been found between the Global North and South with women being more concerned than men in the Global North (Baldwin et al., 2023). However, cross-country studies and studies in the Global South are inconclusive of the role gender plays in concern with some studies finding no significant influence or men being more concerned (Hornsey et al., 2016; Lewis et al., 2019). As youth have a more

fluid worldview, it is easier to engage them with topics such as climate change and proactive behaviour without worldview bias strongly impacting the results (Harker-Schuch et al., 2021).

2.2. Collective Action

Collective action describes the formation of groups to live, move and work together by using various forms of power and violence (Jordan, 2022). The advantage of collective action is the power in numbers that individual action would not create (Wrbka et al., 2012). Participating describes involvement in the community and social activities (Piškur et al., 2014). Thus, participating in collective action means an involvement in social activities to work together and profit from the power the number of participants creates.

In their study, Brown et al. (2023) noticed that engaging youth in collective action impacts their well-being more than individual behaviour changes. Youth empowerment leads to a decrease in feelings of being overwhelmed, powerless and stressed and increases optimism and resilience (Bessaha et al., 2022). If youth participate in climate change activities and see what they can personally do, they feel more in control and hopeful (Gunasiri et al., 2022; Kolenatý et al., 2022). Thus, strengthening activism can be seen as a coping tool for concerned youth (Oswald & Langmaid, 2022). Ojala (2012) describes three coping strategies that have differing effects on emotional well-being and engagement with climate change issues. Problem-focused coping is achieved by engaging with the topic, learning about it in addition to acting to diminish its consequences while meaning-focused coping is a change in personal framing of the issue such as accepting negative emotions or engaging in spirituality. Emotion-focused coping minimises the threat of climate change and is connected to decreased engagement with the topic (Ojala, 2012). Various researchers have since noticed that using only problem-focused or emotion-focused coping can lead to an increase in negative emotions long-term indicating that collective climate action by itself might only increase well-being short-term (Brown et al., 2023; Daeninck et al., 2023; Ojala, 2012). The reason for this is that youth at some point will realise their limited leverage when combating climate change, hence if taking action is their only way of coping they might start to feel powerless (Ojala, 2012).

2.3. Climate Change Knowledge and Understanding

Frick et al. (2004) divide climate change knowledge into three parts. System knowledge explains the mechanisms behind ecosystems and what impacts them, for example, carbon emissions' relationship with climate change. Action knowledge shows how actions can help with mitigating or adapting to climate change. Effectiveness knowledge describes how effective a certain behaviour is towards combating climate change (Frick et al., 2004). Shi et al. (2016) noticed in their study a relation between heightened knowledge about the causes of climate change and higher levels of concern, but a negative or non-significant relation between knowledge about physical characteristics of climate change and concern levels. Traditionally education has been seen as a promotion tool for sustainability (Kessler, 2021). Still, some behaviour change theories believe that knowledge only plays a minor role in behaviour changes (van der Linden, 2017; Wang & Chen, 2022). According to Kessler (2021), an increase in civic knowledge and trust in organisations leads to a higher level of climate change concern. Wang and Chen (2022) and Rouhiainen and Haanpää (2023) noticed that an increase in system knowledge caused an increase in climate change concern. Thus it can be assumed that knowledge leads to an increase in concern which then induces pro-environmental behaviour (Wang & Chen, 2022). There is a difference in knowing about climate change and a full understanding of its effects, which might be one of the reasons why studies find differing correlations between knowledge, concern and behaviour: the more complex of an understanding someone has the more substantial the relationship to pro-climate behaviour (Kolenatý et al., 2022). This is in line with Frick et al.'s (2004) findings that system knowledge did not have a direct influence on behaviour while action and effectiveness knowledge seem to do. Since factors such as attitude, norms and sociodemographics play a key role in influencing behaviour changes as well (Kolenatý et al., 2022), this could be why many people with vast climate change knowledge stay inactive (Luís et al., 2018).

2.4. Perceived Personal Affectedness

The more personal climate change feels to someone, the more concerned someone will be about it (Dong et al., 2023). Creating this sense of personal affectedness is made difficult by the optimism bias where people believe that climate change will affect them less than the world in general (Barros & Pinheiro, 2020). This can be seen in higher levels of concern in countries that are already impacted by climate change (Hickman et al., 2021) as well as in a higher risk perception for society than for one personally (Barros & Pinheiro, 2020; van der Linden, 2017). On top of that, climate change being a rather abstract concept makes people less motivated to change their behaviour (Simon et al., 2022). Moreover, only a small percentage of people believe that their actions can help combat climate change (Berger et al., 2019) and an over or underexposure to the climate crisis leads to feelings of powerlessness (Bright & Eames, 2022). Therefore, climate change needs to be framed as a challenge to overcome to engage people (Chou et al., 2023).

2.5. Theoretical Framework

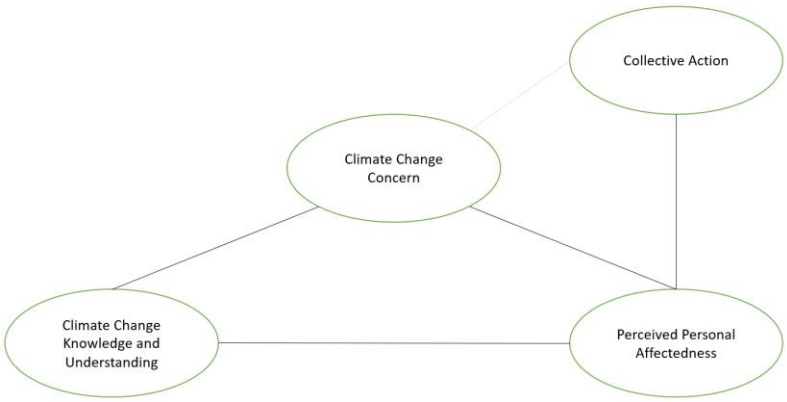

Figure 1: Climate change concern framework

Climate change concern is influenced by various factors such as knowledge, perceived affectedness, worldview, and attitude (Hornsey et al., 2016; Kessler, 2021; Uba et al., 2023; van der Linden, 2017). This makes researching risk perception a complex matter. This research seeks to specifically study the knowledge variable and its relation to concern and perceived personal affectedness as can be seen in Figure 1. This is because climate change awareness is rising, but individual risk perception is not (Kessler, 2021). One reason for this can be that many people know

about climate change and believe it to be an issue but do not feel personally affected (Barros & Pinheiro, 2020). This leads to a low-risk perception, making a personal relationship to climate change a driver in climate change concern levels (Dong et al., 2023). This optimism bias shows the importance of a thorough understanding of the issue. The deeper the knowledge and understanding of the climate crisis, the more concerned people become as they understand the different factors at play and how they will affect the world and themselves (Kolenatý et al., 2022). Climate change concerns can then be turned into constructive behaviour changes and be used as an inherent driver of social engagement (Sciberras & Fernando, 2022). Being engaged and working together with others is important as it can increase the feeling of being in control and having power over one's future (Gunasiri et al., 2022). Thus, collective action can help lower and deal with climate change concern levels (Han et al., 2022).

3. Methodology and Methods

An explanatory mixed method approach was used by conducting a quantitative survey with some open questions followed by one focus group discussion (Blaikie, 2010). Surveys are a common tool used to measure changes in behaviour and attitude (Lior, 2012) and focus group discussions allow multiple participants to discuss issues and to compare their responses directly (Barbour, 2018). Thus, this approach allowed for receiving in-depth information on some of the results and questions of the survey.

Survey

A pre/post survey was used to assess potential changes in the level of climate change concern of the youth. A pre/post survey fit the research questions as it depicted the respondent's attitude and knowledge before and after the training (Howard, 1980). The survey questions (see Annex 1 & 2) stemmed from a mix of existing questionnaires by Han et al. (2022); Hermans and Korhonen (2017); Reser et al. (2012) and Rouhiainen and Haanpää (2023). Some were taken directly from the source, whereas others were adapted to fit this study (see Tables 1 & 2). Questions (Q) 24-28 were only asked in the second survey round as they addressed a change in thinking and gave background information that only needed to be collected once.

Table 1: Binary & open questions survey

Question	Source	Topic
Q1-Q3		General Information (Gender, Age, Village)
Q11	Adapted from Hermans and Korhonen (2017)	Views on Climate Change
Q14	Reser et al. (2012)	Perceived affectedness
Q17-Q18	Adapted from Reser et al. (2012)	List of potential concerns
Q19	Adapted from Reser et al. (2012)	Responsibilities to act
Q21	Adapted from Reser et al. (2012)	Open question about any further notes on the topic
Q24	Adapted from Reser et al. (2012)	Change in thinking
Q22-Q23, Q25-Q28		Open questions about the training and participation in the project

The questions were further divided into indexes measuring the different variables influencing climate change concern as well as the climate change concern level itself. The indexes consist of categorical items on a 5-point Likert scale. The first index is the *climate change knowledge and understanding index (Knowledge-Index)*, which indicates personal assessment of climate change knowledge. This index consists only of Q20. The *collective action index (Action-Index)* measures the belief that participating in climate action positively impacts their life and consists of Q7 and Q8. The *perceived personal affectedness index (Affectedness-Index)* comprises Q4, Q5, Q6, Q12 and Q15 and measures the perceived affectedness of participants. Lastly, concern is measured by the *climate change concern index (Concern-Index)* and consists of Q9, Q10, Q13 and Q16.

Table 2: Likert-Scale questions survey

Question	Source	Topic	Index
Q4-Q6	Reser et al. (2012)	Specific concerns (Health, economic and familial situation)	Affectedness-Index
Q7-Q8	Adapted from Reser et al. (2012)	Relation between concerns and action	Action-Index
Q9-Q10	Han et al. (2022)	Worry environment	Concern-Index
Q12-Q13	Adapted from Reser et al. (2012)	Concern level	Concern & Affectedness-Index
Q15-Q16	Adapted from Reser et al. (2012)	Concern level	Concern & Affectedness-Index
Q20	Rouhiainen and Haanpää (2023)	Climate Change understanding	Knowledge-Index
Q24	Adapted from Reser et al. (2012)	Change in thinking	

Focus group

One focus group was conducted to receive background and in-depth information on the survey results. The reason for this being only one group was time constraints in addition to the logistics of conducting a focus group in a remote location. The questions (see Annex 3) for the focus group were either rephrased questions from the survey to gain more validity and in-depth answers (Q1, Q4, Q5) or gave background information on the population, the survey results, and their engagement in the YLCA project (Q2, Q3, Q6, Q7, Q8). The topics covered in the discussion

were their understanding of climate change (Q1), the impact of climate change on their life (Q2, Q3, Q6), and their participation in the YLCA project (Q4, Q5, Q7, Q8).

3.1. Data Collection

75 youth in secondary school or just out of school, aged 13 to 22, participated in the training and were thus given the survey. At least 39 received some general training on disaster preparedness and climate change before this climate change training. The 75 youth were split into two groups consecutively trained over the course of a day each. The first survey was given to all respondents at the beginning of the training while the second survey was given out at the end of the training. The data stems thus from before and after participants engaged in the climate-related educational effort. The survey was translated and handed out by staff members from ChildFund Cambodia on the ground to the youth attending the training. The questions were mainly quantitative with six open questions, four of them asked only in the second survey round. The questions gave the respondents multiple options or a five-point Likert scale to show how much they agreed with a statement. Only the questions about age, gender and village were made mandatory after the first survey was facilitated due to realising that some participants were younger than 15. The survey stated that participation was voluntary and briefly explained the goal of the study and how the data would be stored and used. Since the survey was handed out as part of the training, the response rate was high with 96% for the pre-survey and 92% for the second round (Pre: 72/75 Post 69/75 replies). Due to an inconsistent internet connection, the youth had to share phones to take the survey, which could explain the lower participation in the second round. 29% of respondents for the pre-and 24% for the post-survey were male. The survey was filled out by two participants in the pre- and three participants in the post-survey who were under the age limit of 15. As 15 is the age of consent in Sweden their data was deleted. The parents of the youth were informed by the youth group leaders about the project their children were participating in and when the youth were invited to the training. The training took place at the end of March and the focus group discussion was conducted two weeks later.

The focus group discussion was organised and facilitated by ChildFund Cambodia, and the results were shared for this research. Participants in the focus group were four youths from the

YLCA project between the ages of 18 and 19 (two male and female each) and the discussion language was Khmer. The discussion took place in the local school compound and lasted one and a half hours. Youth volunteered for the discussion after being informed about it by their youth group leaders. At the beginning of the focus group discussion, the purpose of the research was explained as well as that participation was voluntary and questions did not have to be answered. The moderator and note-taker were staff from Child Fund Cambodia. This gave the advantage of the moderator knowing the language as well as the culture of the participants. The arguments made by the youth were then summarised by the note-taker and translated into English.

3.2. Data Analysis

SPSS29 was used to analyse the quantitative data gained during the two survey rounds. Before analysing the data, it was cleaned by removing outliers due to incomplete or missed questions and illogical entries. The data analysis compared the groups of respondents by gender as well as the two points in time. The open questions were translated into English by ChildFund Cambodia staff members, and all open questions were coded into numerical categories. Questions nine and ten as well as answer options four to eight for question eleven were reverse coded to fit the positive statements of all other questions. As some items were categorical and some were binary data, descriptive statistics were used for all and inferential statistics for the categorical data. Items were computed to create indexes as described above and their relative index score was calculated by dividing each index by the number of items included. Descriptive analysis was conducted for each index and normal distribution was tested by conducting the Kolmogorov-Smirnov test and analysing graphs. Reliability and validity were checked using Cronbach's Alpha, Factor Analysis, and pair-wise correlation. The index differences in the pre-and post-study were then checked for statistical significance using the Wilcoxon Signed Rank test and their effect size was calculated using Cohen's (1988) criteria. The signed rank test compared differences in median values.

3.2.1. Normal Distribution

Table 3: Kolmogorov-Smirnov results

Index		Kolmogorov-Smirnov coefficent
Knowledge-Index	pre	p = <.001
	post	p = <.001
Affectedness-Index	pre	p = <.001
	post	p = .001
Concern-Index	pre	p = .188*
	post	p = <.001
Action-Index	pre	p = .012
	post	p = <.001

Note: stars indicate significant p-values: * p > .05

To be non-significant and thus normally distributed, the results of the Kolmogorov-Smirnov test need to be p > .05 (Mat Roni, 2021). However, this is not the case for any of the indexes, except for the pre-survey Concern-Index (see Table 3). This means that non-parametric tests were used to analyse and compare the data.

3.2.2. Validity and Reliability

Convergent and discriminant validity can be checked using factor analysis and the Fornell-Lackert criterion table (Mat Roni & Djajadikerta, 2021). Internal validity and reliability can be measured using Cronbach's alpha coefficient. However, Cronbach's alpha can be sensitive to a small number of items in a scale which is why the mean inter-item correlation can be used as an alternative (Pallant, 2003).

Table 4: Cronbach's alpha coefficients and Mean inter-item correlations

Index		Cronbach's alpha coefficient	Mean inter-item correlation	Average Variance Extracted (AVE)
Knowledge-Index (pre/post)		*Not applicable*		
Affectedness-Index	pre	.807*	.447*	.568***
	post	.777*	.408*	.532***
Concern-Index	pre	.358	.137	.412
	post	.722*	.396*	.549***
Action-Index	pre	.527	.359*	.679***
	post	.290	.172*	.586***

Note: stars indicate significant values: * Cronbach's alpha > .7 **inter item correlation between .2 and .4 *** AVE > .5

As the Knowledge-Index consists of only one question, no analysis could be conducted, the results of the other three indexes can be seen in Table 4. The results of Cronbach's alpha, mean inter-item correlation, AVE and the Fornell-Larcker criterion table support the validity and reliability of the Affectedness-Index. Nevertheless, the reliability and validity of the pre-survey Concern-Index and the post-survey Action-Index are weaker. The Action-Index consists of only two items which can explain the low Cronbach's alpha scores and the mean inter-correlation shows reliability and validity in the pre-survey. However, in the post-survey, reliability and validity are weaker but still close to .2. Lastly, for the pre-survey Concern-Index Cronbach's alpha was .357, the mean inter-item correlation was .137 and the AVE was under .5, all indicating very low validity and reliability. However, for the post-survey sample, all three indicators showed high reliability and validity which is why the index was still used for analysis. The square root AVEs on the diagonal in the Fornell-Larcker criterion table were more than the ones on the off-diagonal in both the pre-and post-survey which supports sufficient discriminant validity (see Annex 4).

Focus group

A written summary of the focus group discussion was generated and translated by ChildFund Cambodia. This means that ChildFund Cambodia did a preliminary analysis of the discussion and

determined key topics that were brought up. This summary was then used as a starting point for a deductive thematic analysis of the focus group discussion. The coding was done by hand due to the small amount of data. First keywords were selected, and these were then coded and put into themes fitting with the existing literature. The four themes discussed in the theoretical framework were found in the focus group discussion and the codes were thus divided into climate change knowledge and understanding, perceived personal affectedness, climate change concern and collective action.

3.3. Ethical Considerations

There are multiple ethical considerations to be made. One fundamental ethical principle that is especially relevant in this research is the principle of not causing harm. Harm can not only be physical but also emotional (Social Research Association, 2021) and thus discussing topics related to mental health can cause emotional harm. Researchers need to be sensitive towards vulnerable populations and plan their research thoroughly to minimise any negative emotional responses. This was achieved by mainly using pretested questions from literature in the survey and by carefully wording the questions in the focus group discussion by asking no personal questions but rather questions about the entire group (Creswell, 2013; Social Research Association, 2021). All questions were reviewed by local staff members to ensure cultural sensitivity. The local facilitators of the survey and focus group were aware of the risks and ensured that if any negative responses occurred, the youth were supported.

Informed consent was achieved by having a header in the survey that included all necessary details such as the purpose of the study, anonymity and how the data would be stored, for the focus group informed consent was given orally at the beginning of the session. The survey was anonymous and only collected personal information on age, gender, and their community's name. The focus group findings were already anonymised in the summary, thus no personal information on any participants is used in this thesis.

Another limitation is conducting research on a different cultural context from a distance. While this can improve objectivity, it can also lead to cultural differences being missed or being wrongly interpreted (Barbour, 2018). This was tried to decrease by discussing the survey and

focus group questions with the local team. However, due to not facilitating the survey personally, it could not be checked who filled out the survey. Because of that the survey was taken by three participants who were under the age limit of 15 and their data had to be disregarded.

4. Results

The results are divided into the four interrelated concepts from the theoretical framework. These concepts are climate change knowledge and understanding, climate change concerns, perceived personal affectedness and collective action. The results from the quantitative and qualitative analysis were sorted according to these themes and compared within each theme. Lastly, some items regarding climate change concern and perceived personal affectedness were compared with each other as well as the Knowledge-Index and the Concern-Index.

4.1. Climate Change Knowledge and Understanding

We think our concerns are lower if we do not participate in this project because before joining this project, we did not know anything on what climate change is, so we are not interested in it and not feeling about it. But when involved with the project, we became aware of its impact, which made us concerned about this issue, and also learned about some mitigation methods.

This quote from the focus group discussion shows the relationship between knowledge and climate change concerns. Before the project, the youth's knowledge about climate change was very limited and hence they did not have many negative feelings regarding this issue. But by participating and thus engaging with the topic they started to gain system knowledge about climate change and developed concern. This can also be seen in the survey where more people indicate that they understand what climate change is in the post-survey (see Figure 2) since the median (Mdn) for the Knowledge-Index was significantly higher in the post-survey (Mdn = 4) as confirmed by the results of the Wilcoxon Signed Rank Test, $z = -2.519$, $p < .02$. The median is illustrated by a line in all subsequent boxplots while the x represents the mean. The effect size though is rather small with $r = .22$ showing that the influence of the training on climate change knowledge and understanding is not that big. Next to gaining system knowledge, the youth also described in the focus group discussion how they gained action and effectiveness knowledge regarding mitigation tools they can now use for their projects. This fits with the results of Q26 showing that most youths feel better prepared for the project after the training. When asked if the training changed their thinking about climate change (Q25) the vast majority agreed and some added that it was due to their climate change understanding growing.

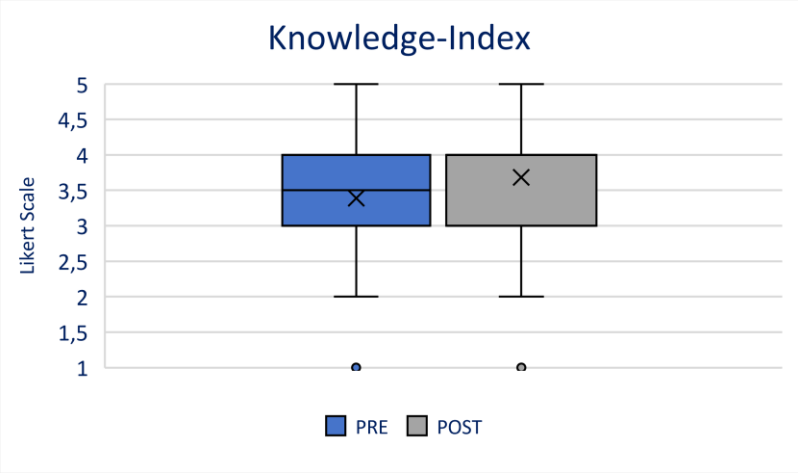

Figure 2: Knowledge-Index pre- & post-survey

Differences between genders (see Figure 3) can be seen here as male participants were initially more confident about their climate change knowledge levels with most agreeing or strongly agreeing that they know what climate change means while female participants were more divided with half of them disagreeing or being neutral on what climate change means. In the post-survey however, male participants were less sure about their knowledge, although 65% now agreed with the statement, the mean stayed the same and no one strongly agreed that they knew what climate change was. For female participants though the amount of people agreeing with the statement almost doubled showing a strong shift in knowledge confidence.

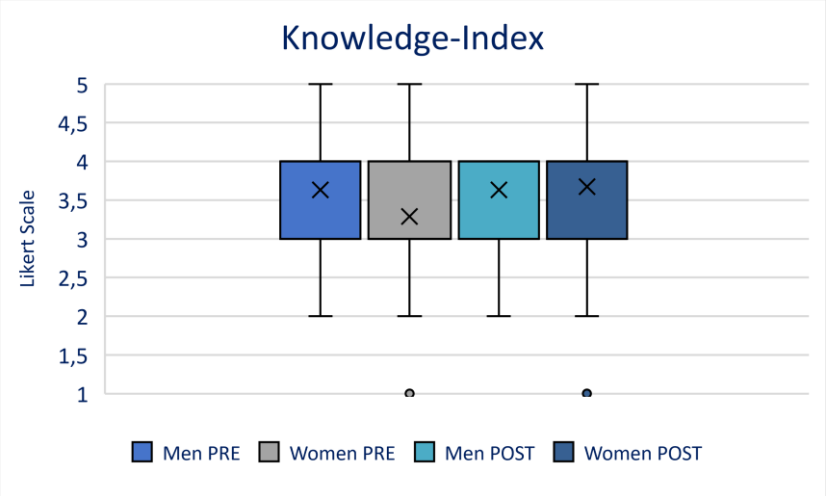

Figure 3: Knowledge-Index by gender

4.2. Perceived Personal Affectedness

"We felt even more anxious because of the fear of extreme heat affecting us."

All effects of climate change described in the focus group discussion were on a personal level showing how feeling personally affected influences concern. Natural hazards that were mentioned in the discussion as relevant for the youth were *strong winds*, which were mentioned several times, *severe storms*, *drought*, *floods*, *heavy rain*, *lightning*, *loss of life* and *drastic temperature changes*. This can be compared to the results of Q18 of the survey about various environmental threats they are concerned about (see Figure 4) where *floods* and *droughts* were the most common responses when asked about environmental threats. The hazards mentioned in the focus group discussion are part of the ones most selected in the survey with *floods* and *droughts* being chosen by roughly 70% in the pre-and the post-survey. Although *storms* and *health impacts* were picked by less than half of the participants, they were still among the most mentioned hazards. While *heatwaves* and *drought* were mentioned in the focus group discussion, *water scarcity* was not discussed but was chosen as a threat in both survey rounds by almost 50% of participants.

Four personal effects of climate change could be identified in the focus group discussion: impacts on their health, their communities, the environment, and businesses. This is in line with the survey results. When asked about concerns about their personal health, economic situation and family, the majority agreed or strongly agreed with the statement that climate change will negatively impact these (Q4-6). In Q17 (*I am concerned about environmental problems because of the consequences for…*) *my health* was chosen by 36% in the pre-survey and by 47% in the post-survey as a possible consequence of climate change they are concerned about. More than 60% of youth chose consequences for their community as one of their climate change concerns in this question. This matches the focus group discussion results, where youth mentioned being fearful of seeing climate change impact their communities. While most youths were concerned about general consequences for themselves and their communities, only 20% (post-survey 27%) were concerned that their lifestyle was going to be impacted.

Looking at perceived personal affectedness from an urgency standpoint, in the pre-survey 47% of youth said that Cambodia is already feeling the effects of climate change (see Figure 4). This number rose by 16% in the post-survey, with a decrease in participants saying that climate change will affect Cambodia in 10-25 years. While in the first survey round, 17% did not know when Cambodia would be affected, this amount decreased to 8% in the second survey round. In both survey rounds, there was a small number of outliers choosing options stating that climate change will only be an issue for Cambodia in the distant future. This is in line with a small number of respondents choosing the statement that only other parts of the world will be affected by climate change (Q11: *Regarding climate change, I feel that…*).

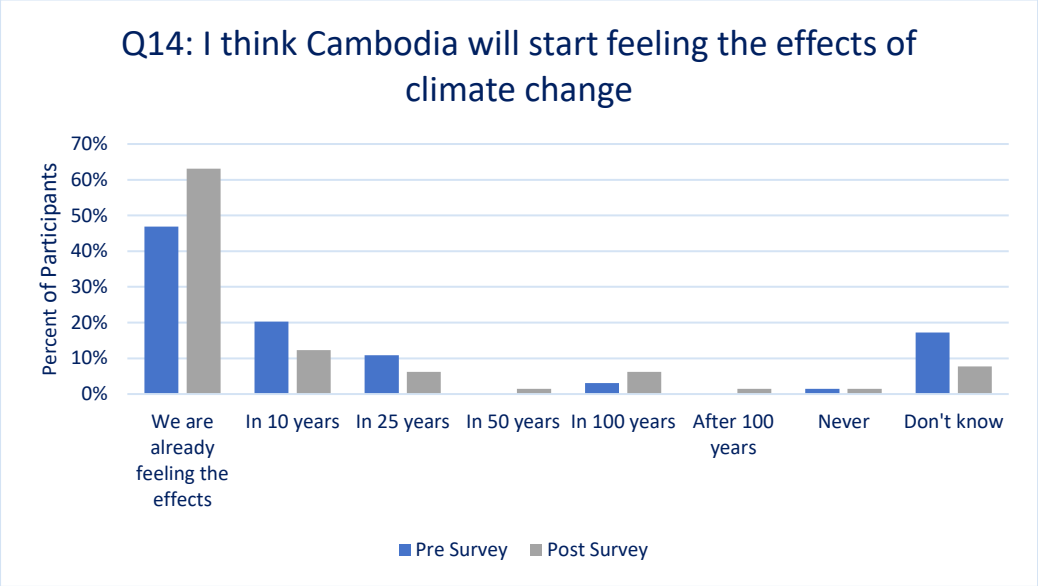

Figure 4: Question 14 pre- & post-survey

The results of the Wilcoxon Signed Rank Test were not statistically significant for the Affectedness-Index, with $z = -.919$, $p > 0.05$, and showed a very small effect size ($r = .08$). The training thus does not have any significant effect on feeling personally affected which can be seen in the median not changing from the pre-training (Md = 3.8) to the post-training (Md = 3.8) (see Figure 5).

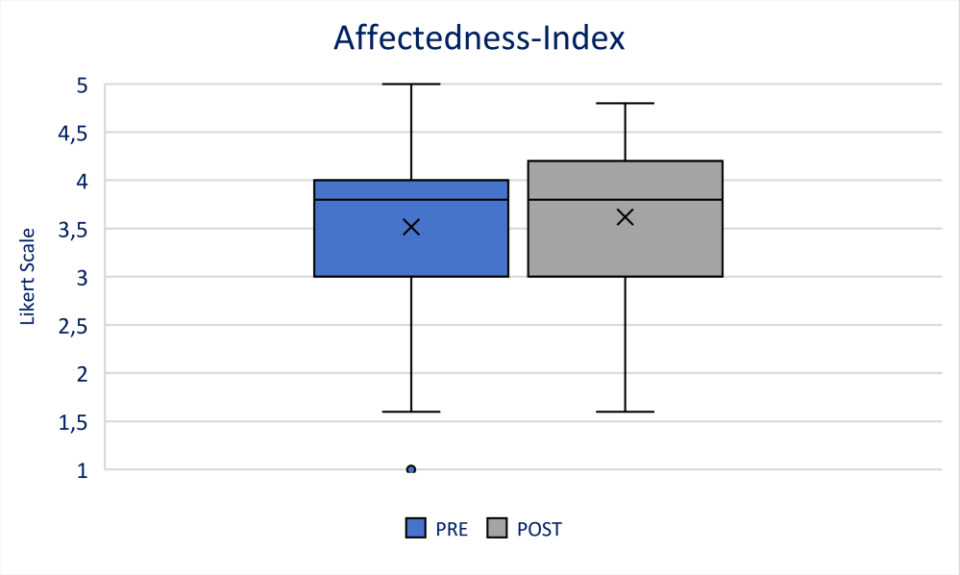

Figure 5: Affectedness Index pre- & post-survey

4.3. Climate Change Concern

As already mentioned, the youth described in the focus group discussion how their concern levels increased by gaining knowledge and feeling personally affected. During the discussion phrases such as "*fear of*", "*we felt even more anxious*" and "*made us concerned*" were used, highlighting their increasing concern. In the survey, there was an increase in youth selecting phrases such as *The concern should be taken more seriously* and *I am worried about its consequences* after the training. When asked if the youth are worried about environmental problems, most agreed or strongly agreed with this statement (Q10). This fits with the results for Q13 (*If nothing is done to reduce the negative impacts of climate change in the future, I think it will be a serious problem for the world*) and Q16 (*Considering any potential effects of climate change that there might be in society in general, I am concerned about climate change*) asking if the effects of climate change on society and the world make the youth concerned. Here the majority of participants also agreed or strongly agreed with the statements. A slight increase in respondents agreeing with these statements could be seen between the pre-and post-survey, while the median concern almost stayed the same, the lower range of answers moved towards the more concerned side (see Figure 6). Although the median slightly increased, the result for the Wilcoxon Signed Rank Test does not show a statistically significant effect of the training on

concern levels with z = - 1,491 and p > 0.05. This can also be seen in the small effect size (r = .13). This means that the training does not significantly affect the concern level.

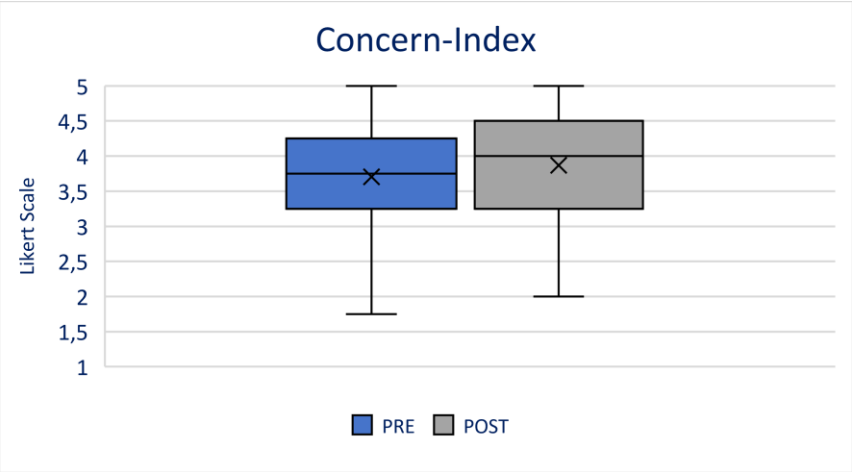

Figure 6: Concern-Index pre- & post-survey

When selecting environmental threats they are concerned about (Q18), only a small number of youths picked answers regarding the global context such as *a global financial crisis* or *international conflicts*. The option *impacts of climate change* was in both survey rounds picked by less than 22% of participants. For almost every threat an increase in the number of participants choosing this specific threat could be seen in the second survey round. Especially for the threat of *cyclones*, *heatwaves,* and *a global financial crisis* the number more than doubled. Regarding the consequences of climate change (Q17) youth were especially concerned about the effects on *plants* and *all people*. Consequences on *animals* were also chosen by 32% (and 45% in the post-survey) with three participants specifying that they were concerned for their *livestock*. In the post-survey round, each item for Q17 was selected by at least 27% of the participants (in the pre-survey 20%). The influence of climate change on the perception of the world can be seen in Q24 as 74% agree or strongly agree that they changed their thinking due to climate change and now take environmental issues more seriously.

In both survey rounds a small number of respondents (see Figure 7) picked responses stating that climate change is something positive or that it will be stopped, and technology will solve the problem (Q11: *Regarding climate change, I feel that…*). While fewer participants chose these options in the post-survey, an increase in youth saying that the threat of climate change is exaggerated can be seen (from 11.6% to 22%).

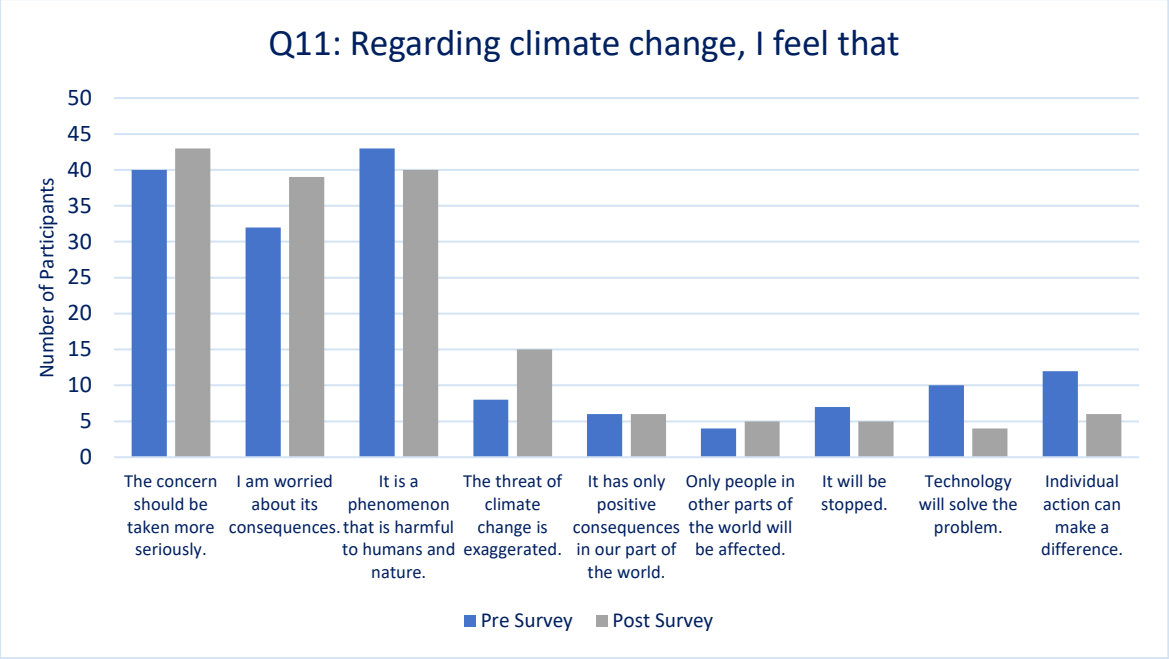

Figure 7: Q11 pre- & post-survey

Differences in the Concern-Index between men and women can be seen (see Figure 8). In the pre-survey, the responses of male participants are relatively normally distributed with most answers being between 3.0 and 4.0, while for female participants answers are relatively evenly spread out with only one bigger spike around 3.5. In the post-survey, the responses of men shifted to the right side of the scale, with 3.0 being the smallest response and 68.8% of responses being higher than 4.0. Meanwhile, for women, the responses are more skewed to the right as well, but the distribution is still more equal with almost 50% having a score lower than 4.0.

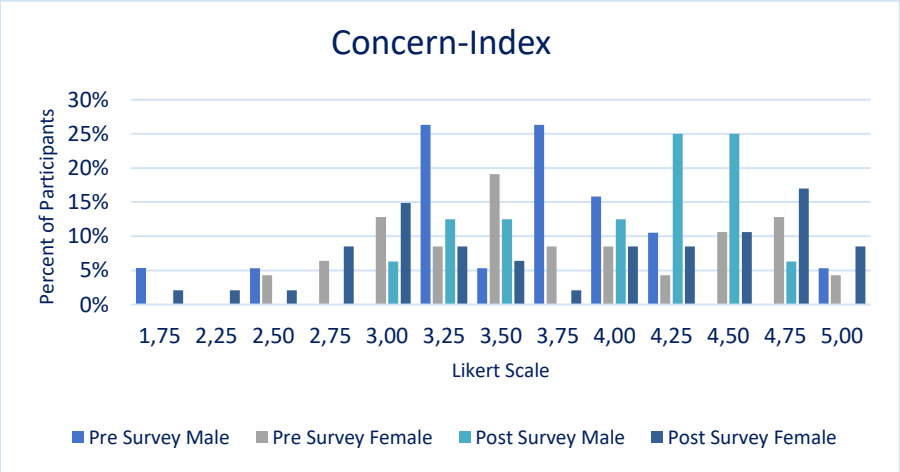

Figure 8: Concern-Index by gender pre- & post-survey

4.4. Collective Action and Project Participation

In the focus group discussion, the youth mentioned many different tools they can use to become active in combating climate change and that can improve their concern levels such as *planting trees*, *reducing toxic fumes*, *waste*, *chemical fertilizer or plastic bags* or *mapping hazards and safety shelters*. *Sharing knowledge and raising awareness with friends, family, and the community* as well as *planting trees* were mentioned in three questions regarding actions they could take to improve their concern levels.

The youth also stated that participating helps them gain the courage to talk to and engage with local authorities and strengthens their presentation and communication skills. This is in line with more than 50% of youth saying that the project gives them more confidence to act (Q28: *In your opinion, what are the main benefits of working in a youth collective?*). 65% of youth also stated that collective action as a group will be more effective in influencing change (Q28) which fits with fewer people believing that individual action can make a difference in the second survey round (Q11). The benefits of the project on concern levels are further expressed by 39% of participants saying that the project makes them feel more positive towards the future (see Figure 9). They also gained support in the project by generating friendships and having opportunities to talk about their concerns with their peers.

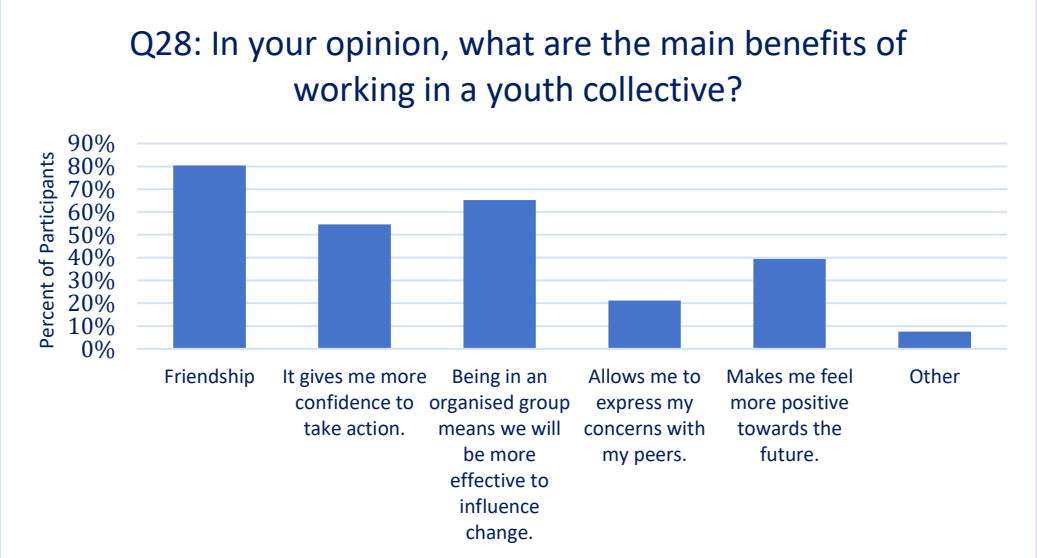

Figure 9: Q28 post-survey

Challenges regarding participation in the project mentioned by the youth during the focus group are mainly that men are less confident speaking up about these kinds of issues. An explanation for this in the discussion was that men are in the minority in the project with only 30% being male. Time is also a big constraint for them as most youth either go to school or university and thus have other obligations besides the project.

When asked who has the responsibility to take action against climate change the three most selected options were *environmental groups, individuals and their families*, as well as *local authorities* (Q19). In the post-survey, there was an increase of 14% in participants choosing *individuals and their families* as an option (from 39% to 53%). *Industry and companies* were only selected by 26%, and 36% of respondents in the post-survey, putting responsibility mainly on private actors.

In the survey, the majority of youth said that the project helps them deal with climate change concerns which fits with an increase in the belief that action can influence concern levels as well as how they and their communities deal with the impacts of climate change (Action-Index median rises from 3.4 to 4, see Figure 10). This can also be seen with the Wilcoxon Signed Rank test that was statistically significant ($z = -1.993$, $p < 0.05$) with a small effect size ($r = .17$). It thus can be concluded that the belief in collective action is slightly increasing with the training which can also be seen in the median from the pre-training (Md = 3.5) increasing for the post-training (Md= 4.0).

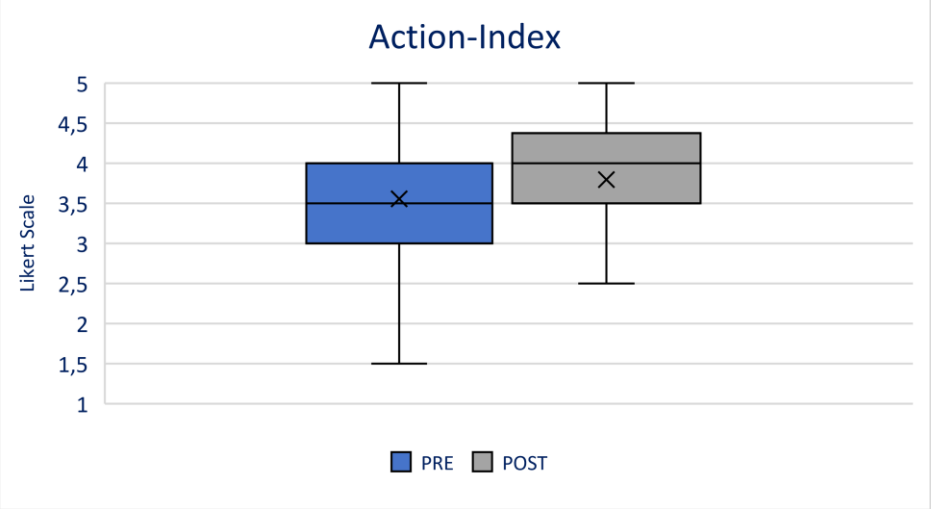

Figure 10: Action-Index pre- & post-survey

4.5. Comparison between different questions and indexes

Comparing perceived personal affectedness and climate change concern levels, only minor differences are seen between Q12 (*If nothing is done to reduce the negative impacts of climate change in the future, I think it will be a serious problem for Cambodia*) and Q13 (*If nothing is done to reduce the negative impacts of climate change on the future, I think it will be a serious problem for the world*). However, when asked if they are concerned about climate change considering any potential effects that might affect them personally and society in general (Q15 & Q16), the responses for questions phrased from an individualistic perception (personally) in both survey rounds had fewer people strongly agreeing with the statement than the same question about society at large as can be seen in Figure 11. For Q17 (*I am concerned about environmental problems because of the consequences for…*) however, consequences for people, such as consequences for *children* and *future generations*, were picked more often than consequences for the environment, such as *plants* or *animals*.

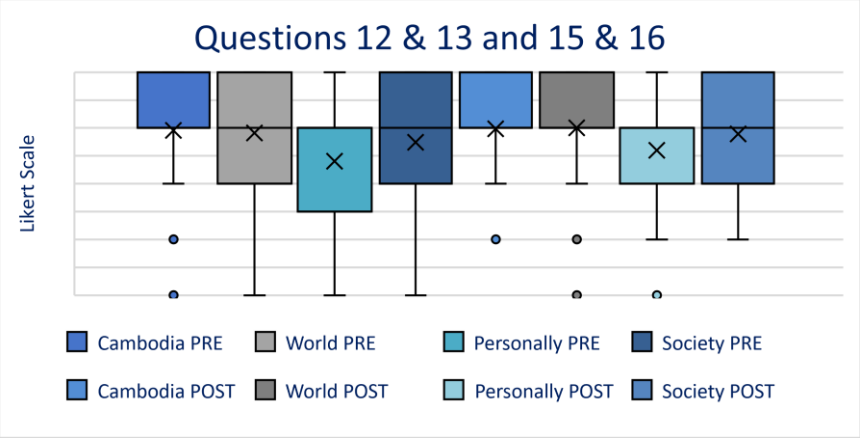

Figure 11: Pre- & post-survey Q12 & 13 and Q15 & 16

The relationship between climate change concern (measured by the Concern-Index) and climate change knowledge and understanding (measured by the Knowledge-Index) was investigated using Spearman's rank correlation coefficient. There was a non-significant, weak, positive correlation for the pre-survey between the two variables, rho = .181, n = 64, p > .068. However, for the post-survey, there was a significant, moderate, positive correlation between the two variables, rho = .417, n = 63, p < .001 meaning that high levels of knowledge are linked to high levels of general climate change concerns.

5. Discussion

5.1. Climate Change Concern

When analysing the change in concern from the pre- to the post-survey for significance, the result is non-significant, meaning that the training is not influencing concern levels significantly and the slight increase might be by chance. The reason for this could be the multitude of factors influencing risk perception and concern next to knowledge. Hornsey et al. (2016), Kessler (2021), Uba et al. (2023) and van der Linden (2017) describe how other factors such as cultural background, age, gender and political views influence risk perception. Thus, an explanation for this non-significant finding can be that due to these factors, youth already had a high concern level, that was only slightly influenced by the training, which is also seen in the small effect size (r = .13). Another reason could be the low validity and reliability of the pre-survey Concern-Index, which indicates that the index did not perfectly measure concern levels in the first survey round. This could have been due to the youth not understanding the questions properly before the training (Mat Roni & Djajadikerta, 2021) or that the group was too homogenous (Bernardi, 1994) since in the second survey round reliability and validity were high.

A slight increase in concern can be visible between the two survey rounds in most survey questions. Although the medians stayed the same, the means increased slightly in eight out of the eleven Likert-Scale questions (Q4, Q7, Q8, Q9, Q12, Q13, Q15 and Q16). For the multiple-choice questions, an increase in alternatives chosen was also seen in the post-survey indicating that youth might have been more concerned or realised the diverse consequences climate change can have. This is also expressed by the youth in the focus group discussion explaining that due to their involvement in the project, they became more concerned about climate change. Likewise, findings by Kessler (2021), Rouhiainen and Haanpää (2023); Shi et al. (2016), and Wang and Chen (2022) all found a relationship between knowledge and climate change concerns in their respective studies. When asked if the youth had changed how seriously they take environmental issues due to climate change, 74% agreed or strongly agreed that they had changed their thinking. This shows the big impact climate change has on their lives. It can further be seen in Q18 about the direct effects of environmental threats where more than double the number of participants chose environmental issues like *cyclones*, *heatwaves*, and *a global financial crisis* in the post-

survey. This would indicate that the training about climate change did lead to the youth being more concerned about the issue which was also seen in the mean of the Concern-Index moving from 3.75 to 4. This suggests that the increase although not significant was not by chance, which also aligns with the positive correlation between knowledge and concern in the post-survey. Therefore, the training needs to consider its role in increasing climate change concerns and the responsibility it thus has to minimise these negative effects.

In this survey, a difference between men and women could be seen in concern levels before as well as after the training. At both times men indicated a higher level of concern than women. Studies looking into gender differences for pro-environmental behaviour and action in the Global North have found women to be more concerned (Baldwin et al., 2023; Tindall et al., 2003), however, this does not seem to be the case when looking at concerns in the Global South (Rouhiainen & Haanpää, 2023) and comparing climate change beliefs globally (Hornsey et al., 2016), aligning with the current results. One reason for the result of this study could be the unequal distribution of men and women in this project (only 29% and 24% of respondents were male in each survey round). Another reason could be gender roles such as women feeling more comfortable seeking support and talking with others about their concerns, which decreases them (Li et al., 2021). Some studies have indicated that men might have a better knowledge and understanding of climate change and thus higher concerns which could explain the higher Concern-Index score (Dong et al., 2023; Momsen, 2000). However, this does not match with the results from the Knowledge-Index of this study, as in the second survey round, women were feeling more confident about their knowledge levels than men. As climate change concern levels can be influenced by a variety of factors, these might be able to explain the difference (Hornsey et al., 2016; Uba et al., 2023; van der Linden, 2017). This fits with Kahan et al.'s (2007) findings on gender only influencing risk perception in connection with certain worldviews. However, more research would be needed to explain this event and the influence of such factors fully.

When comparing the results of Q24 with a study by Reser et al. (2012) looking at the risk perception of youth in Australia relating to threats and impacts due to climate change, similarities can be found. In their study, 57.3% of youth agreed or strongly agreed that their thinking has changed due to climate change which is 17% less than in this study. Nonetheless, in both studies,

the majority of youth indicate that climate change impacted their thinking about the environment showing the strong impact the topic has on them. In the current study, 58% of youth in the pre- and 65% in the post-survey chose that climate change needs to be taken more seriously and 46% in the pre-and 59% in the post-survey selected that they are worried about its consequences (Q11). In comparison, in a Finnish study by Hermans and Korhonen (2017) done with ninth graders, 55% of students agreed with both statements. These similar results show that in Cambodia as well as in Finland, many youths are worried about the consequences of climate change, thus supporting the validity of the current study.

When asked about their concerns relating to climate change consequences, the most picked answer options related to consequences for humans (*my health, people in the community, all people*) rather than the environment, where only *plants* were picked by a vast majority of people. This is in contrast to the results of Reser et al. (2012) where more Australian youth chose consequences for the environment (*plants, marine life, animals*) than consequences for humans. One reason for this could be that people with Asian backgrounds put a smaller emphasis on biosphere-related concerns (Rouhiainen & Haanpää, 2023). This is also supported by a study by Wu (2012), that found a differing relationship regarding pro-ecological and pro-human beliefs in Chinese and Western students. The study noticed that Chinese students looked at environmental problems from a social rather than an ecological concern point. This means that they were more concerned about the effects of climate change on humanity, i.e. limited resources, rather than, common in the West, a concern about how humanity is impacting the environment. This however did not mean, that they were not aware or concerned about the environment, but mainly that they looked at the problem from a different perspective, in line with this study's findings (Wu, 2012).

It is not surprising that their health, community, and the environment were the most relevant issues for youth considering all of these concerns are related to expected impacts of climate change (Ung et al., 2017). On top of this Cambodia is ranked 15th in global exposure to disasters, which will only increase due to climate change (United Nations Office for Disaster Risk Reduction, 2019). While consequences on health and the environment were often mentioned in Reser et al. (2012) as well, consequences on the community were low in comparison. This difference in results

is most likely due to the role and importance of family as well as communities in Cambodia versus Australia. In Cambodia community and extended family units play a vital role in dealing with challenges while in Australia less importance is put on these factors (Jacobson, 2020; Mahmoudi Farahani, 2016; Masunaga et al., 2023).

5.2. Perceived Personal Affectedness

Perceived personal affectedness played a vital role in this survey when measuring climate change concerns. However, it was not significantly increased due to the training which suggests that knowledge was not an important factor in influencing the perceived affectedness of youth in this project. Literature identified a relationship between knowledge and societal risk perception but no influence on personal risk perception (Kohl & Wardropper, 2022; van der Linden, 2017). One reason can be that the provided knowledge is not related enough to local consequences (Kohl & Wardropper, 2022) which could be the case in this study as well. However, since the training focused on local climate change impacts when talking about adaptation, the training tried to generate a personal connection to the topic. Based on these findings it could be argued that the training should have addressed their affectedness, leading to the assumption that other factors are potentially responsible for the stagnant result.

One factor could be that the youth are experiencing climate change effects firsthand leading to an already high perceived affectedness in the first survey round. This can be seen by the Affectedness-Index median of 3.8 and 47% of respondents saying that Cambodia is already feeling the effects of climate change in the pre-survey. This argument is supported by Lee et al. (2015) who found that the strongest influential factor for risk perception in many Asian countries was the perception of local temperature changes as well as by Hickman et al. (2021), who noticed a higher amount of concerned youth in countries that are already affected by climate change.

In the post-survey, more participants selected options relating to personal consequences of climate change in Q17 and that Cambodia is already affected by climate change than in the pre-survey suggesting that the knowledge did affect perceived affectedness somewhat. It further seemed to play a role in which environmental threats youths chose as most concerning. In the survey when youth were asked about environmental threats (Q18) they worry about, the option

impacts of climate change was chosen less than other more specific threats such as *floods* and *droughts* in both survey rounds. Comparing this to a similar question being asked by Reser et al. (2012) in a survey of Australian youth, the results were quite similar with most adolescents choosing concrete environmental threats over the option *climate change impacts*. This can be explained by the broadness of the topic of climate change which can lead to people focusing on specific threats that seem more immediate (Uba et al., 2023), even though these can be related to climate change (Kessler, 2021). Thus, by raising awareness and increasing knowledge about climate change and its relationship to these threats, perceived personal affectedness should increase (Kohl & Wardropper, 2022; Lee et al., 2015).

The focus on more immediate threats can also be seen outside the environmental scope. In a study across 22 countries by Kessler (2021), the majority of students not only ranked climate change as a lower pressing issue than other environmental issues, they also ranked issues such as *crime*, *conflict* or *a financial crisis* higher than *climate change*. In the pre-study, this is not the case for this study where *climate change* was selected by more participants than those issues. This could have been due to youth knowing that the subject of the survey and training was climate change and thus being focused on the topic. However, in the post-study, the number of people choosing *crime*, *conflict,* or *a financial crisis* as a source of concern increased, while the number of people choosing *climate change* as a threat slightly decreased. This might be due to youth being overwhelmed by the discussion of climate change in the training which led to them wanting to reduce their concerns by focusing on other issues (Kohl & Wardropper, 2022). Yet it could also be related to optimism bias which describes the feeling or belief that others will be more affected by climate change than oneself. It is related to perceived personal affectedness as many people know about climate change and see it as a risk for the world but not to themselves (Barros & Pinheiro, 2020). Optimism bias is hence one of the reasons for different perceptions in societal versus personal risk perception (van der Linden, 2017).

Looking at optimism bias, the stable high Affectedness-Index median in the first and second survey rounds in addition to 47% and then 63% of youth believing that Cambodia is already feeling the effects of climate change, suggests a low optimism bias. However, differing risk perceptions for society at large and oneself can also be seen in this survey, when youth are asked about

climate change affecting them personally or society. Youth strongly agreed with the statement about society but less with the personal one. On top of this, less than 27% of youth said they are concerned about their lifestyle being affected by climate change. These results are consistent with previous findings by Reser et al. (2012) where Australian youth had a slightly bigger difference between the personal and societal questions, but 54% stated that climate change was already affecting Australia. Moreover, less than 28% said they were concerned (7 or 6 on the Likert scale) about their lifestyle being affected. Kohl and Wardropper (2022) noticed that even in one country, people will still believe their area will be less affected than the rest. This can also be seen in this study, youth showed only slight differences between climate change effects on the world and their country being a serious problem in contrast to the above-described differences when asked about society and them personally. These findings suggest that youth make a distinction between climate change affecting their country and themselves and show the role of optimism bias in youths' personal and societal risk perception. Optimism bias can thus be seen as a way to cope with climate change concerns by denying the negative effects of climate change on oneself (Ojala, 2012). It can however result in people overestimating their ability to deal with climate change effects and lower their engagement with pro-environmental behaviours (Kohl & Wardropper, 2022; Ojala, 2012).

5.3. Climate Change Knowledge and Climate Change Concern Nexus

The results of this study show that youth's climate change knowledge and understanding increased after the training. The significant increase in the Knowledge-Index, as well as the results of the focus group discussion, show that their engagement with this topic was relatively low before joining the project. Measuring knowledge using one self-assessed item has its limitations since participants are self-reporting their knowledge meaning it is inherently biased by their perception (Shi et al., 2016). This can lead thus to an over- or underestimation of their knowledge levels. Since the rise in knowledge was also seen in other questions such as Q14 (*I think Cambodia will start feeling the effects of climate change*), a rise in knowledge is presumed. While in the pre-survey 17.20% replied that they do not know when Cambodia will feel the effects of climate change, in the post-survey only 7.7% chose this answer. This shows that the training led to an increase in climate change knowledge and understanding as more participants were able to

answer the question in the second round. Receiving knowledge regarding climate change also increased their concerns as they actively dealt with the subject. This can be seen in the significant positive correlation in the second survey round. This is in line with various studies that noticed higher levels of concern after an increase in knowledge (Kessler, 2021; Rouhiainen & Haanpää, 2023; Shi et al., 2016; Wang & Chen, 2022). Reasons for the non-significant correlation in the first survey round could be the previously discussed factors influencing concern levels next to knowledge such as the already high personal affectedness in the first survey round.

When connecting knowledge and behaviour changes it needs to be addressed which type of knowledge is actually influencing this change when talking about climate change (Frick et al., 2004). This is important as some types of knowledge do not have a significant effect on changing concern levels (Shi et al., 2016). According to literature, system knowledge by itself is thus often not enough to create behaviour changes and action and effectiveness knowledge are needed (Frick et al., 2004; Kolenatý et al., 2022). All three knowledge types were given in the training used for this study, with climate change adaptation being a central part. Thus, these findings are in agreement with the current literature about the role of knowledge on climate change concerns.

Comparing the pre-training results to a study by Rouhiainen and Haanpää (2023) conducted with school children in Cambodia using the same question to measure knowledge, the results are very similar with a difference in mean of .09 and a difference in standard deviation of .172. Comparing their item relating to climate change concerns with the index created here, a bigger difference can be seen (Rouhiainen and Haanpää, 2023, mean: 4.01, mean pre-survey: 3.39), this could be due to this survey using multiple items to measure concern. Another reason could be that their participants were younger, and younger children seem to have a higher concern level (Lee et al., 2020).

As knowledge was measured using a self-assessment, youth could have over- or underestimated their knowledge levels. This could explain why more male participants in this study indicated a very high knowledge level in the pre- than the post-survey. In connection to this argument, some participants had prior training on climate change and thus men could have overestimated their knowledge at first. However, the number of male participants having had prior training was only 11% higher in comparison to female participants which thus does not

entirely explain the difference in knowledge estimation. One other reason for the decrease in perceived knowledge for men could be that women are more likely to admit their low knowledge level in comparison to men, as it does not affect their status in society as much (Momsen, 2000). This would suggest that men in the first survey round exaggerated their knowledge level and were more realistic in the second survey round or realised that they did not know as much about the topic as they expected due to the learnings of the training.

The small effect size of the training on climate change knowledge and understanding could be explained by some of the youth having received training about climate change before this project, which is in line with the mean for the Knowledge-Index already being 3.39 in the pre-survey. Still, the youth stated that they feel better prepared to tackle the project after the training showing that their action and effectiveness knowledge increased. This further accentuates the relationship between knowledge and behaviour changes and shows the importance of climate change education (Frick et al., 2004; Wang & Chen, 2022).

However, in both survey rounds, a small number of respondents indicated that climate change will not have negative consequences for Cambodia which is in line with the study by Reser et al. (2012). While fewer participants chose these options in the post-survey, indicating that the knowledge gained decreased these beliefs, an increase in youth selecting the statement “the threat of climate change is exaggerated” could be seen (11.6% to 22%). One reason for this increase could be that participants got overwhelmed by the knowledge gained and thus, to protect themselves, assigned the risk a lower gravity. This is in line with findings on other topics that found information overload to lower risk perception (Gardikiotis et al., 2021). Information overload can be defined as a state where efficient usage of information by a person is hindered by the amount of information available to them and can lead to feeling overwhelmed and out of control (Bawden & Robinson, 2009). Bawden and Robinson (2009) further explain that a reaction to these negative feelings might be information avoidance. This fits with Ojala’s (2012) description of the emotion-focused coping strategy that de-emphasises the seriousness of climate change or even denies it fully and can lead to decreasing pro-environmental behaviour. This strategy is already used by young children to deal with their emotions and might be applied by some youth in this project as well (Ojala, 2012).

5.4. Collective Action

In the survey, only a small number of youths believed that individual action could make a difference regarding climate change and the number further decreased for the post-survey (17% pre-and 9% post-survey). This is in agreement with the findings of Berger et al. (2019). In their survey, only a small percentage of people believed that they personally could help in combating climate change. One reason for this could be that being over or underexposed to climate change can lead to people feeling powerless (Bright & Eames, 2022). This powerlessness is related to youth feeling like their individual action does not have enough impact on a complex topic like climate change (Brown et al., 2023). The feeling of being powerless as well as overexposed to the topic due to the training could also explain why the number dropped in the second survey round, as youth might have felt overwhelmed. This overexposure could have increased their concern and demotivated them to take action (Sciberras & Fernando, 2022), explaining these results.

However, as can be seen by the Action-Index, youth also believe that by being active, they can influence their feelings positively and help them and their families deal with the effects of climate change. This can be seen by the significant increase in the median from 3.5 to 4, which shows that the training played a role in increasing their belief in collective action. It can also be seen by 65% of youth indicating that one benefit of the project is them being more effective as an organised group. This is in line with other studies that showed that climate change concerns can be used constructively to drive social engagement (Sciberras & Fernando, 2022). Being active can improve feelings by sharing concerns with others and getting a sense of control over one's future and lower concern levels (Gunasiri et al., 2022; Han et al., 2022). The youth seem to believe this as they in the focus group discussion mention that they use the project and activities like planting trees or sharing information with their communities to positively influence their feelings. In the survey, 39% also expressed that participating in the project makes them feel more positive towards the future and 80% stated that friendships are one of the main benefits.

The stark difference between the response about individual action and the Action-Index could simply be due to the individual action question being part of a broader multiple-choice question. This could have led to participants putting less thought into each answer option and thus not selecting this option as it also was the last option in the question. However, it could also be

because youth believe that collective action is the solution for combating climate change. Acting as a collective, they have more impact and potential for change and are more likely to improve their well-being (Brown et al., 2023).

The improvement in well-being can be partly seen by an increase in confidence the project gives the youth, which was indicated by 55% of youth when asked in the survey, as well as in the focus group discussion. This is partly due to the project helping them to improve their communication and presentation skills, thus giving them the courage to talk with local authorities. This increase in confidence and self-efficacy is important to maintain their motivation to be active against climate change (Baldwin et al., 2023; Buttigieg & Pace, 2013). Especially the increase in skills and knowledge is a good motivator for volunteering (Buttigieg & Pace, 2013).

The youth mentioned a wide variety of action ideas that could help them deal with their concerns in the survey and the focus group discussion such as planting trees or reducing negative impacts on the environment. Sharing knowledge and raising awareness with friends, family and the community was also mentioned multiple times. Studies such as Oswald and Langmaid (2022) and Zaremba et al. (2023) have found an increase in well-being and positive emotions by joining collective action as this creates a sense of belonging and empowers the youth. However, when comparing the actions described here with the three coping strategies identified by Ojala (2013), the activities described by the youth all fit in the realm of problem-focused coping by focusing on collective action to diminish the consequences of climate change. Since problem-focused coping by itself can lead to an increase in negative emotions and a decrease in engagement, a mix of problem- and meaning-focused coping is encouraged to increase well-being (Ojala, 2013). Daeninck et al. (2023) describe that climate action can become a concern-increasing coping tool if it is the only long-term coping strategy used as youth will at some point realise that they cannot solve the climate crisis by themselves. This highlights the importance of engaging in climate action as a group so youth can share these feelings with fellow activists (Zaremba et al., 2023). To increase their long-term well-being and include all three coping methods, the focus when engaging youth in climate action should thus be on taking action, increasing resilience and social support (Daeninck et al., 2023).

Challenges mentioned by the youth during the focus group discussion were time constraints and gender differences. Since most youth go to school or university, they only have limited time to put into their projects. This is a quite common issue in volunteer work, where time constraints due to other responsibilities limit the amount of work the volunteers can do (Buttigieg & Pace, 2013). Another challenge mentioned by the youth was men feeling less confident to speak up since they are in the minority in the project. These challenges need to be taken into account when planning participation activities in the project to support youth accordingly and make the participation of everyone count (Cornwall, 2008).

Youth in this project put responsibility for action against climate change on private actors (*environmental groups* as well as *individuals and families*) and *local authorities*. In the second survey round, more people chose *individuals and families* to be responsible than *local governments* and, in both rounds, more people held them responsible than *national governments* or the *international community*. This is a big difference from the results of Reser et al. (2012) where the majority of youths picked *national governments*, *industry* and the *international community* over *individuals* and *environmental groups*. Comparing these findings with Skeirytė et al.'s (2022) study on the European Union, youth put responsibility primarily on *industry* and then *national governments*. The explanation here was that youth believe less in the power of governments to influence the climate crisis. In comparison to older generations, they also chose individual responsibility which was explained by many youths already participating in environmental action and acknowledging its importance (Skeirytė et al., 2022). This could explain why these were the most chosen options in this study as well. Another reason could be that youth in the training and survey look at climate change on a local scale, looking at how it currently is and will influence them personally. This is then reflected in their answers to this question by looking at local responsibility and thus choosing local actors such as themselves, local authorities, and environmental groups over distant actors such as the national government.

5.5. Reflections

Looking at the results, the training did not significantly increase the concern of youth but did increase their climate change knowledge and understanding. The training thus fulfils its purpose by focusing on positive aspects of climate change adaptation and collective action without worrying the youth significantly. This is important from an ethics standpoint to not cause harm with the project (Social Research Association, 2021). The small effect size of the training could be explained by the vast factors that influence climate change risk perception (Hornsey et al., 2016; Uba et al., 2023; van der Linden, 2017). This could be why the impact on the different indexes was small, as factors such as values or political ideology were not considered in this analysis. Since many behaviour theorists believe knowledge to only have a minor influence on behaviour changes, it is thus important to in future studies also look at these other factors (Wang & Chen, 2022) to motivate the youth to participate in collective action after the training.

The specificity of the case and the context used make the generalisability of the findings difficult. The scope of the study is small as the geographical scope with one specific project in three communities in Cambodia is limiting. Cultural factors play a role in risk perception, but most literature used here is from the Global North, which can influence the results generated. Some findings or relevant aspects might have been interpreted differently or overlooked due to the lack of comparative studies in a similar context. Thus, more research on the concerns of youth in Southeast Asia is needed to increase generalisability. This means that the results are very context as well as culture-dependent. Since one of the indexes used indicated weak reliability and validity, this needs to be taken into consideration when extrapolating these results to a wider context. Thus, caution should be used when upscaling any of these findings though they could be applicable in similar cultural contexts, projects and when drafting climate change education.

Since there is a lack of findings from the Global South, more research in these contexts is needed as there seem to be differences between how youth in the Global South and North react and deal with climate change concerns. Conflicting theories exist on the role of knowledge in determining risk perception as well as concerns. One reason is different concepts of knowledge, thus the impact of different knowledge types on risk perception and concern necessitates further research. On top of that, the multitude of factors influencing concern and thus risk perception

require more research on their correlations, especially culturally dependent factors such as values and gender roles and a geographical comparison between these could be of value. As this research focused on training provided by nongovernmental organisations in a project context, it could also be of interest to compare the findings of this study with other projects and training in the realm of climate change action and mitigation.

5.6. Methodological limitations

The mixed-method approach of this study made a broad and in-depth understanding of the youths' concerns possible. However, limitations to this research method exist. A general drawback of this study was the limited scope as it only looked at one specific project and region of Cambodia. This thus restricted data to a rural context and limited transferability. The biggest limitation that had a direct impact on survey responses, as well as the focus group, was the need for a translator to translate to Khmer and then back to English. Translations can change the meaning of questions and thus falsify the findings. One way to prevent this is by having someone else translate the questions back to English to see if the meaning stays the same (Young, 2015). While this was not possible due to time restraints, multiple people translated the questions together.

Social desirability bias is one possible bias when answering questionnaires. This means that the youths' answers might have been influenced by the context in which they answered the survey and what they perceived to be the wanted responses in addition to how they wanted to present themselves. This was tried to be mitigated by stating clearly that the survey would stay anonymous and by explaining the purpose of the research (Larson, 2019). As the youth filled out the survey, answers represented their perception of themselves and thus, for example, rather than measuring their actual knowledge levels, measured what they perceived to be their knowledge. The advantage of this self-reporting is the feasibility of gathering a lot of data in a short period, however, as people's self-assessment is vastly different this skews the results, and should thus be considered when looking at the results (Brown et al., 2015). To create more objectivity multiple items were used to measure most topics. However, knowledge was only measured by one item.

Measuring knowledge using one self-assessed item means that participants are self-reporting their knowledge making it inherently biased by their perception (Shi et al., 2016). This can lead to an over- or underestimation of their knowledge levels. Asking the participants to assess their knowledge before and after the training can increase validity since it makes them reflect on their knowledge levels. However, a multidimensional scale, measuring multiple layers of climate change knowledge and understanding would be preferable considering the complexity of this topic (Shi et al., 2016).

The Concern-Index also had some issues with reliability and validity meaning that the index did not measure concern levels perfectly. This means that the variables might have been measured inconsistently and did not solely measure concern. However, since reliability and validity were given in the post-survey round, this indicates that the items in the Concern-Index were not properly understood by the youth in the first survey round (Mat Roni & Djajadikerta, 2021). Another explanation could be that the responses were too homogenous at first which could be due to the participants not being randomly selected but all part of this specific project (Bernardi, 1994).

As a focus group discussion includes multiple participants, the power dynamics between the group as well as regarding the facilitators need to be taken into account as well. An experienced moderator can decrease this limitation by paying attention to these dynamics and trying to steer against them (Barbour, 2018). The moderators in this study had experience in conducting focus group discussions. Another limitation in the focus group discussion was the poor internet connection of the project location which made it impossible for the researcher to observe. Referring back to power relations in research, an observation also could have negatively impacted the data collection due to perceived power imbalances between participants and observers (Creswell, 2013). Consequently, the researcher had to rely on a translated summary leading to the personal views of the note-taker and translator influencing the results. Further potential variation in opinions might be missing from the summary. This was tried to be limited by the note-taker summarising every point made by the youth rather than summarising multiple points in one statement.

6. Conclusion

This research used a mixed methods approach consisting of a pre/post survey as well as one focus group discussion to gain insight into different dimensions of climate change concern. It specifically looked at the effects of climate change training on climate change concern levels, perceived personal affectedness, knowledge and understanding as well as climate action of youth in the YLCA project in Cambodia. The hypothesis was that the training would increase the knowledge of the youth and their concerns, but that participating in collective action could be used as a tool to manage these concerns. This hypothesis was partially rejected as climate change concerns did not significantly increase after the training. While a significant increase in knowledge was visible after the training, the concern levels as well as the perceived personal affectedness did not. The concern levels, but especially the perceived personal affectedness were already high before the training, leading to the conclusion that other factors such as values and experiencing climate change firsthand seem to be driving forces on youths' concern levels rather than an increase in knowledge which is in line with literature on the role of knowledge in risk perception and concern. This appears to be the case in the current study as well, however, in the focus group discussion as well as in the survey a small increase in concerns was still noticeable. Thus, the first research question, whether an increase in knowledge affected the climate change concerns the youth in the project had, can be answered by saying the concerns increased albeit not significantly.

The second research question asked whether participating in collective action helped in dealing with the youth's climate change concerns. The survey results showed a significantly increased belief of the youth in collective action helping them to deal with their emotions as well as the climate crisis in the second survey round. The focus group discussion further indicated this when the youth described activities they partake in to reduce their concerns. However, they also stated that participation in the project made them interested in the topic and thus increased their concerns by them becoming more aware of climate change consequences. These results match previous studies that found collective action to help in coping with concerns but that, when used as the only coping mechanism, it can lead to an increase in negative emotions.

The findings of this study thus show the complexity of climate change concerns and accentuate the importance of well-thought-through training when talking about climate change. Training needs to be holistic and not simply talk about the effects of climate change but focus on building resilience, emotional support and coping along with action to create hope and diminish feelings of powerlessness. It also shows the importance of coping tools, and that training incorporates a diverse range of tools usable by youth. Considering the results of this study, the training modules used in the YLCA project seem to be a good baseline to build on.

References

Baldwin, C., Pickering, G., & Dale, G. (2023). Knowledge and self-efficacy of youth to take action on climate change. *Environmental Education Research*, *29*(11), 1597-1616. https://doi.org/10.1080/13504622.2022.2121381

Barbour, R. (2018). *Doing Focus Groups* (Second ed.). SAGE Publications Ltd. https://doi.org/10.4135/9781526441836

barnfonden. (2023). *Climate informed & climate prepared*.

Barros, H., & Pinheiro, J. (2020). Climate change perception by adolescents: reflections on sustainable lifestyle, local impacts and optimism bias. *Psyecology*, *11*(2), 260-283. https://doi.org/10.1080/21711976.2020.1728654

Bawden, D., & Robinson, L. (2009). The dark side of information: overload, anxiety and other paradoxes and pathologies. *Journal of Information Science*, *35*(2), 180-191. https://doi.org/10.1177/0165551508095781

Berger, N., Lindemann, A. K., & Böl, G. F. (2019). Public perception of climate change and implications for risk communication. *Bundesgesundheitsblatt*, *62*, 612-619. https://doi.org/10.1007/s00103-019-02930-0

Bernardi, R. A. (1994). Validating Research Results when Cronbach'S Alpha is Below .70: A Methodological Procedure. *Educational and Psychological Measurement*, *54*(3), 766-775. https://doi.org/10.1177/0013164494054003023

Bessaha, M., Hayward, R. A., & Gatanas, K. (2022). A scoping review of youth and young adults' roles in natural disaster mitigation and response: considerations for youth wellbeing during a global ecological crisis. *Child and Adolescent Mental Health*, *27*(1), 14-21. https://doi.org/10.1111/camh.12517

Blaikie, N. (2010). *Designing social research: The logic of anticipation*. John Wiley & Sons.

Bright, M. L., & Eames, C. (2022). From apathy through anxiety to action: emotions as motivators for youth climate strike leaders. *Australian Journal of Environmental Education*, *38*(1), 13-25. https://doi.org/10.1017/aee.2021.22

Brown, A., Collado, S., Evans, G. W., & Loebach, J. E. (2023). Designing learning environments for promoting young people's constructive coping with climate change. In J. J. Lockman (Ed.),

Advances in Child Development and Behavior (Vol. 65, pp. 169-198). Academic Press Inc. https://doi.org/10.1016/bs.acdb.2023.05.005

Brown, G. T. L., Andrade, H. L., & Chen, F. (2015). Accuracy in student self-assessment: directions and cautions for research. *Assessment in Education: Principles, Policy & Practice*, *22*(4), 444-457. https://doi.org/10.1080/0969594X.2014.996523

Buttigieg, K., & Pace, P. (2013). Positive Youth Action Towards Climate Change. *Journal of Teacher Education for Sustainability*, *15*(1), 15-47. https://doi.org/doi:10.2478/jtes-2013-0002

Charlson, F., Ali, S., Augustinavicius, J., Benmarhnia, T., Birch, S., Clayton, S., Fielding, K., Jones, L., Juma, D., Snider, L., Ugo, V., Zeitz, L., Jayawardana, D., La Nauze, A., & Massazza, A. (2022). Global priorities for climate change and mental health research. *Environment International*, *158*. https://doi.org/https://doi.org/10.1016/j.envint.2021.106984

ChildFund Cambodia. (2023). *Youth Led Climate Action in Prey Veng Province, Cambodia* [internal report unpublished].

Chou, D. T., Abelama Neto, E., Thomas, I., Martin, A., & Benoit, L. (2023). Climate awareness, anxiety, and actions among youth: a qualitative study in a middle-income country. *Brazilian Journal of Psychiatry*, *45*(3), 258-267. https://doi.org/10.47626/1516-4446-2022-2890

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Routledge. https://doi.org/https://doi.org/10.4324/9780203771587

Cornwall, A. (2008). Unpacking 'Participation': models, meanings and practices. *Community Development Journal*, *43*(3), 269-283. https://doi.org/10.1093/cdj/bsn010

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). SAGE.

Dados, N., & Connell, R. (2012). The Global South. *Contexts*, *11*(1), 12-13. https://doi.org/10.1177/1536504212436479

Daeninck, C., Kioupi, V., & Vercammen, A. (2023). Climate anxiety, coping strategies and planning for the future in environmental degree students in the UK. *Frontiers in Psychology*, *14*. https://doi.org/10.3389/fpsyg.2023.1126031

Dong, X., Geng, L., & Rodríguez Casallas, J. D. (2023). How is cognitive reappraisal related to adolescents' willingness to act on mitigating climate change? The mediating role of

climate change risk perception and believed usefulness of actions. *Environmental Education Research*, *29*(12), 1758-1779. https://doi.org/10.1080/13504622.2022.2120188

Frick, J., Kaiser, F. G., & Wilson, M. (2004). Environmental knowledge and conservation behavior: exploring prevalence and structure in a representative sample. *Personality and Individual Differences*, *37*(8), 1597-1613. https://doi.org/https://doi.org/10.1016/j.paid.2004.02.015

Gardikiotis, A., Malinaki, E., Charisiadis-Tsitlakidis, C., Protonotariou, A., Archontis, S., Lampropoulou, A., Maraki, I., Papatheodorou, K., & Zafeiriou, G. (2021). Emotional and Cognitive Responses to COVID-19 Information Overload under Lockdown Predict Media Attention and Risk Perceptions of COVID-19. *Journal of Health Communication*, *26*(6), 434-442. https://doi.org/10.1080/10810730.2021.1949649

Gunasiri, H., Wang, Y., Watkins, E. M., Capetola, T., Henderson-Wilson, C., & Patrick, R. (2022). Hope, Coping and Eco-Anxiety: Young People's Mental Health in a Climate-Impacted Australia. *International Journal of Environmental Research and Public Health*, *19*(9), Article 5528. https://doi.org/10.3390/ijerph19095528

Han, P., Tong, Z., Sun, Y., & Chen, X. (2022). Impact of Climate Change Beliefs on Youths' Engagement in Energy-Conservation Behavior: The Mediating Mechanism of Environmental Concerns. *International Journal of Environmental Research and Public Health*, *19*(12). https://doi.org/10.3390/ijerph19127222

Harker-Schuch, I., Lade, S., Mills, F., & Colvin, R. (2021). Opinions of 12 to 13-year-olds in Austria and Australia on the concern, cause and imminence of climate change. *Ambio*, *50*(3), 644-660. https://doi.org/10.1007/s13280-020-01356-2

Helldén, D., Andersson, C., Nilsson, M., Ebi, K. L., Friberg, P., & Alfvén, T. (2021). Climate change and child health: a scoping review and an expanded conceptual framework. *The Lancet. Planetary health*, *5*(3), e164-e175. https://doi.org/10.1016/S2542-5196(20)30274-6

Hermans, M., & Korhonen, J. (2017). Ninth graders and climate change: Attitudes towards consequences, views on mitigation, and predictors of willingness to act. *International Research in Geographical and Environmental Education*, *26*(3), 223-239. https://doi.org/10.1080/10382046.2017.1330035

Hickman, C. (2020). We need to (find a way to) talk about … Eco-anxiety. *Journal of Social Work Practice*, *34*(4), 411-424. https://doi.org/10.1080/02650533.2020.1844166

Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, R. E., Mayall, E. E., Wray, B., Mellor, C., & van Susteren, L. (2021). Climate anxiety in children and young people and their beliefs about government responses to climate change: a global survey. *The Lancet Planetary Health*, *5*(12), e863-e873. https://doi.org/10.1016/S2542-5196(21)00278-3

Hornsey, M. J., Harris, E. A., Bain, P. G., & Fielding, K. S. (2016). Meta-analyses of the determinants and outcomes of belief in climate change. *Nature Climate Change*, *6*(6), 622-626. https://doi.org/10.1038/nclimate2943

Howard, G. S. (1980). Response-Shift Bias: A Problem in Evaluating Interventions with Pre/Post Self-Reports. *Evaluation Review*, *4*(1), 93-106. https://doi.org/10.1177/0193841x8000400105

Jacobson, C. (2020). Community climate resilience in Cambodia. *Environmental Research*, *186*. https://doi.org/https://doi.org/10.1016/j.envres.2020.109512

Jordan, B. (2022). *Collective Action: Tribes, Empires, Nations, and Protest Movements* (1st ed.) [Online]. Routledge India. https://doi.org/https://doi-org.ludwig.lub.lu.se/10.4324/9781003307136

Kahan, D. M., Braman, D., & Gastil, J. (2007). Culture and Identity-Protective Cognition: Explaining the White-Male Effect in Risk Perception. *Journal of Empirical Legal Studies*, *4*(3), 465-506.

Kessler, E. (2021). Climate Change Concern among Youth: Examining the Role of Civics and Institutional Trust across 22 Countries. *Education Policy Analysis Archives*, *29*(124). https://doi.org/https://doi.org/10.14507/epaa.29.4849

Kohl, P., & Wardropper, C. (2022). Knowledge of majority scientific agreement on anthropogenic climate change predicts perceived global risk better than perceived personal risk. *Journal of Risk Research*, *25*(6), 778-790. https://doi.org/10.1080/13669877.2022.2028883

Kolenatý, M., Kroufek, R., & Činčera, J. (2022). What Triggers Climate Action: The Impact of a Climate Change Education Program on Students' Climate Literacy and Their Willingness to Act. *SUSTAINABILITY*, *14*(16). https://doi.org/10.3390/su141610365

Larson, R. B. (2019). Controlling social desirability bias. *International Journal of Market Research*, *61*(5), 534-547. https://doi.org/10.1177/1470785318805305

Lee, K., Gjersoe, N., O'Neill, S., & Barnett, J. (2020). Youth perceptions of climate change: A narrative synthesis. *Wiley Interdisciplinary Reviews: Climate Change*, *11*(3). https://doi.org/10.1002/wcc.641

Lee, T. M., Markowitz, E. M., Howe, P. D., Ko, C.-Y., & Leiserowitz, A. A. (2015). Predictors of public climate change awareness and risk perception around the world. *Nature Climate Change*, *5*(11), 1014-1020. https://doi.org/10.1038/nclimate2728

Lewis, G. B., Palm, R., & Feng, B. (2019). Cross-national variation in determinants of climate change concern. *Environmental Politics*, *28*(5), 793-821. https://doi.org/10.1080/09644016.2018.1512261

Li, J., Yao, M., & Liu, H. (2021). From Social Support to Adolescents' Subjective Well-Being: the Mediating Role of Emotion Regulation and Prosocial Behavior and Gender Difference. *Child Indicators Research*, *14*(1), 77-93. https://doi.org/10.1007/s12187-020-09755-3

Lior, G. (2012). *Handbook of Survey Methodology for the Social Sciences.* (G. Lior, Ed.). Springer New York. https://doi.org/https://doi-org.ludwig.lub.lu.se/10.1007/978-1-4614-3876-2

Luís, S., Vauclair, C.-M., & Lima, M. L. (2018). Raising awareness of climate change causes? Cross-national evidence for the normalization of societal risk perception of climate change. *Environmental Science & Policy*, *80*, 74-81. https://doi.org/https://doi.org/10.1016/j.envsci.2017.11.015

Mahmoudi Farahani, L. (2016). The Value of the Sense of Community and Neighbouring. *Housing, Theory and Society*, *33*(3), 357-376. https://doi.org/10.1080/14036096.2016.1155480

Marks, E., Atkins, E., Garrett, J. K., Abrams, J. F., Shackleton, D., Hennessy, L., Mayall, E. E., Bennett, J., & Leach, I. (2023). Stories of hope created together: A pilot, school-based workshop for sharing eco-emotions and creating an actively hopeful vision of the future. *Frontiers in Psychology*, *13*, 1-13. https://doi.org/10.3389/fpsyg.2022.1076322

Masunaga, Y., Muela Ribera, J., Nguyen, T. T., de Vries, D. H., & Peeters Grietens, K. (2023). Why Communities Participate in Malaria Elimination Projects: Case Studies from Vietnam, Laos, and Cambodia. *The Journal of Development Studies*, *59*(11), 1670-1682. https://doi.org/10.1080/00220388.2023.2236269

Mat Roni, S., & Djajadikerta, H. G. (2021). *Data Analysis with SPSS for Survey-based Research* (1st ed.). Springer Nature Singapore. https://doi.org/https://doi.org/10.1007/978-981-16-0193-4

Momsen, J. H. (2000). Gender Differences in Environmental Concern and Perception. *Journal of Geography*, *99*(2), 47-56. https://doi.org/10.1080/00221340008978956

Murray, L., Breheny, M., Cumming, R., Erueti, B., Mooney, M., Nash, K. L., Severinsen, C., & Shanly, J. (2023). How does learning about the future of the ocean impact children's emotional wellbeing? Insights from ocean literacy educators in Aotearoa New Zealand. *People and Nature*, *5*(5), 1622-1635. https://doi.org/10.1002/pan3.10528

Ojala, M. (2012). How do children cope with global climate change?: coping strategies, engagement, and well-being. *Journal of Environmental Psychology*, *32*(3), 225-233. https://doi.org/10.1016/j.jenvp.2012.02.004

Ojala, M. (2013). Coping with climate change among adolescents: Implications for subjective well-being and environmental engagement. *SUSTAINABILITY*, *5*(5), 2191-2209. https://doi.org/10.3390/su5052191

Ojala, M., Cunsolo, A., Ogunbode, C. A., & Middleton, J. (2021). Anxiety, Worry, and Grief in a Time of Environmental and Climate Crisis: A Narrative Review. *Annual Review of Environment and Resources*, *46*(1), 35-58. https://doi.org/10.1146/annurev-environ-012220-022716

Oswald, T. K., & Langmaid, G. R. (2022). Considering ecological determinants of youth mental health in the era of COVID-19 and the Anthropocene: A call to action from young public health professionals. *Health Promotion Journal of Australia*, *33*(2), 324-328. https://doi.org/10.1002/hpja.560

Pallant, J. (2003). *SPSS Survival Manual : A Step by Step Guide to Data Analysis Using SPSS* (4th ed.). McGraw-Hill Education. http://ebookcentral.proquest.com/lib/lund/detail.action?docID=744152

Piškur, B., Daniëls, R., Jongmans, M. J., Ketelaar, M., Smeets, R. J., Norton, M., & Beurskens, A. J. (2014). Participation and social participation: are they distinct concepts? *Clinical Rehabilitation*, *28*(3), 211-220. https://doi.org/10.1177/0269215513499029

Preux, P.-M., Chea, K., Chamroeun, H., Bhalla, D., Vannareth, M., Huc, P., Samleng, C., Cayreyre, M., Gérard, D., Dumas, M., & Oum, S. (2011). First-ever, door-to-door cross-sectional representative study in Prey Veng province (Cambodia). *Epilepsia*, *52*(8), 1382-1387. https://doi.org/https://doi.org/10.1111/j.1528-1167.2011.03102.x

Reser, J. P., Bradley, G. L., Glendon, A., Ellul, M., & Callaghan, R. (2012). *Public risk perceptions, understandings and responses to climate change and natural disasters in Australia and Great Britain*.

Rouhiainen, H., & Haanpää, L. (2023). The antecedents of adolescents' climate change concern in Cambodia. *International Research in Geographical and Environmental Education*. https://doi.org/10.1080/10382046.2023.2298072

Sanson, A. V., Van Hoorn, J., & Burke, S. E. L. (2019). Responding to the Impacts of the Climate Crisis on Children and Youth. *Child Development Perspectives*, *13*(4), 201-207. https://doi.org/10.1111/cdep.12342

Sciberras, E., & Fernando, J. W. (2022). Climate change-related worry among Australian adolescents: an eight-year longitudinal study. *Child and Adolescent Mental Health*, *27*(1), 22-29. https://doi.org/https://doi.org/10.1111/camh.12521

Shi, J., Visschers, V. H. M., Siegrist, M., & Arvai, J. (2016). Knowledge as a driver of public perceptions about climate change reassessed. *Nature Climate Change*, *6*(8), 759-762. https://doi.org/10.1038/nclimate2997

Simon, P. D., Pakingan, K. A., & Aruta, J. J. B. R. (2022). Measurement of climate change anxiety and its mediating effect between experience of climate change and mitigation actions of Filipino youth. *The Educational and Developmental Psychologist*, *39*(1), 17-27. https://doi.org/10.1080/20590776.2022.2037390

Skeirytė, A., Krikštolaitis, R., & Liobikienė, G. (2022). The differences of climate change perception, responsibility and climate-friendly behavior among generations and the main determinants of youth's climate-friendly actions in the EU. *Journal of Environmental Management*, *323*. https://doi.org/https://doi.org/10.1016/j.jenvman.2022.116277

Social Research Association. (2021). *Research Ethics Guidance*.

Sok, S., Lebel, L., Bastakoti, R. C., Thau, S., & Samath, S. (2011). Role of Villagers in Building Community Resilience Through Disaster Risk Management: A Case Study of a Flood-Prone

Village on the Banks of the Mekong River in Cambodia. In M. A. Stewart & P. A. Coclanis (Eds.), *Environmental Change and Agricultural Sustainability in the Mekong Delta* (pp. 241-255). Springer Netherlands. https://doi.org/10.1007/978-94-007-0934-8_14

Spence, A., Poortinga, W., Butler, C., & Pidgeon, N. F. (2011). Perceptions of climate change and willingness to save energy related to flood experience. *Nature Climate Change*, *1*(1), 46-49. https://doi.org/10.1038/nclimate1059

Tindall, D. B., Davies, S., & Mauboulès, C. (2003). Activism and Conservation Behavior in an Environmental Movement: The Contradictory Effects of Gender. *Society & Natural Resources*, *16*(10), 909-932. https://doi.org/10.1080/716100620

Uba, K. D., Lavizzari, A., & Portos, M. (2023). Experience of economic hardship and right-wing political orientation hinder climate concern among European young people. *Journal of Contemporary European Studies*, *31*(3), 835-856. https://doi.org/10.1080/14782804.2022.2061433

Ung, M., Luginaah, I., Chuenpagdee, R., & Campbell, G. (2017). Perceptions of climate change impacts and self-rated health in coastal Cambodia. *International Journal of Environmental Studies*, *74*(2), 325-339. https://doi.org/10.1080/00207233.2016.1254961

United Nations. (1992). *United Nations Framework Convention on Climate Change.* https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf

United Nations Office for Disaster Risk Reduction. (2019). *Disaster Risk Reduction in Cambodia: Status Report 2019*. R. O. f. A. a. t. P. United Nations Office for Disaster Risk Reduction. https://www.unisdr.org/files/68249_682301cambodiaupdaed16oct2019.pdf

van der Linden, S. (2015). The social-psychological determinants of climate change risk perceptions: Towards a comprehensive model. *Journal of Environmental Psychology*, *41*, 112-124. https://doi.org/https://doi.org/10.1016/j.jenvp.2014.11.012

van der Linden, S. (2017). Determinants and Measurement of Climate Change Risk Perception, Worry, and Concern. In N. M.C., M. Schafer, E. Markowitz, S. Ho, S. O'Neill, & J. Thaker (Eds.), *The Oxford Encyclopedia of Climate Change Communication*. Oxford University Press. https://doi.org/https://dx.doi.org/10.2139/ssrn.2953631

Wang, X., & Chen, J. (2022). Fear emotion reduces reported mitigation behavior in adolescents subject to climate change education. *Climatic Change*, *174*(1). https://doi.org/10.1007/s10584-022-03419-7

Wrbka, S., Van Uytsel, S., & Siems, M. M. (2012). Access to Justice and Collective Actions: 'Florence' and Beyond. In S. Wrbka, S. Van Uytsel, & M. Siems (Eds.), *Collective Actions: Enhancing Access to Justice and Reconciling Multilayer Interests?* (pp. 1-20). Cambridge University Press. https://doi.org/DOI:10.1017/CBO9781139109383.002

Wu, L. (2012). Exploring the New Ecological Paradigm Scale for Gauging Children's Environmental Attitudes in China. *The Journal of Environmental Education*, *43*(2), 107-120. https://doi.org/10.1080/00958964.2011.616554

Young, T. (2015). Questionnaires and Surveys. In Z. Hua (Ed.), *Research Methods in Intercultural Communication: A Practical Guide* (pp. 163-180). https://doi.org/10.1002/9781119166283.ch11

Zaremba, D., Kulesza, M., Herman, A. M., Marczak, M., Kossowski, B., Budziszewska, M., Michałowski, J. M., Klöckner, C. A., Marchewka, A., & Wierzba, M. (2023). A wise person plants a tree a day before the end of the world: coping with the emotional experience of climate change in Poland. *Current Psychology*, *42*(31), 27167-27185. https://doi.org/10.1007/s12144-022-03807-3

Annex

Annex 1: Survey (English)

**Questions adapted from literature sources*

This survey is about Climate Change Perception and is part of a master's thesis in Sweden by Sonja Hammer, Lund University. It aims to understand your feelings about climate change and your participation in the project Youth-Led Climate Change Adaptation. Your responses are anonymous and stored in compliance with European data security laws. Your involvement is optional, and you can withdraw your consent at any time without penalty. You may skip any question you are uncomfortable with. Your contribution helps us understand how you feel about Climate Change and its impacts, and how organisations like ChildFund can support you. Thank you for participating! If you have any questions, want to know about the results or withdraw your data please contact so7448ha-s@student.lu.se.

1. **Gender**
    - Male
    - Female
    - Other
2. **Age**
3. **Community**
    - កន្សោមអក
    - ពាមមន្ទារ
    - កំពង់ត្របែក
4. **Climate Change will have a noticeable negative impact on my health (over the next 25 years).** (Reser et al. 2012)

    1 strongly disagree - 2 disagree - 3 neutral - 4 agree - 5 strongly agree
5. **Climate Change will have a noticeable negative impact on my economic and financial situation (over the next 25 years).** (Reser et al. 2012)

    1 strongly disagree - 2 disagree - 3 neutral - 4 agree - 5 strongly agree
6. **Climate Change will have a noticeable negative impact on the environment in which my family and I live (over the next 25 years).** (Reser et al. 2012)

    1 strongly disagree - 2 disagree - 3 neutral - 4 agree - 5 strongly agree
7. **I believe that my actions can have an influence on how I, my family and my community deal with the impacts of climate change.** (Reser et al. 2012)*

    1 strongly disagree - 2 disagree - 3 neutral - 4 agree - 5 strongly agree

8. **I believe that actions I can take to manage the impacts of climate change have a positive influence on how I am feeling and thinking about climate change and environmental issues generally.** (Reser et al. 2012)*

   1 strongly disagree - 2 disagree - 3 neutral - 4 agree - 5 strongly agree

9. **Environmental problems will not have serious negative effects for human beings and nature.** (Han et al. 2022)

   1 strongly disagree - 2 disagree - 3 neutral - 4 agree - 5 strongly agree

10. **I am not worried about environmental problems.** (Han et al. 2022)

    1 strongly disagree - 2 disagree - 3 neutral - 4 agree - 5 strongly agree

11. **Regarding climate change, I feel that…** (Hermans & Kohonen 2017)*
    - the concern should be taken more seriously,
    - I am worried about its consequences,
    - it is a phenomenon that is harmful to humans and nature,
    - the threat of climate change is exaggerated,
    - it has only positive consequences in our part of the world,
    - only people in other parts of the world will be affected,
    - it will be stopped,
    - technology will solve the problem
    - Individual action can make a difference.

12. **If nothing is done to reduce the negative impacts of climate change in the future, I think it will be a serious problem for Cambodia.** (Reser et al. 2012)*

    1 strongly disagree - 2 disagree - 3 neutral - 4 agree - 5 strongly agree

13. **If nothing is done to reduce the negative impacts of climate change in the future, I think it will be a serious problem for the world.** (Reser et al. 2012)*

    1 strongly disagree - 2 disagree - 3 neutral - 4 agree - 5 strongly agree

14. **I think Cambodia will start feeling the effects of climate change:** (Reser et al. 2012)
    - We are already feeling the effects
    - In the next 10 years
    - In the next 25 years
    - In the next 50 years
    - In the next 100 years
    - Beyond the next 100 year
    - Never
    - Don't know
    - No opinion

15. **Considering any potential effects of climate change that might affect me personally, I am concerned about climate change.** (Reser et al. 2012)*

    1 strongly disagree - 2 disagree - 3 neutral - 4 agree - 5 strongly agree

16. **Considering any potential effects of climate change that there might be in society in general, I am concerned about climate change.** (Reser et al. 2012)*

    1 strongly disagree - 2 disagree - 3 neutral - 4 agree - 5 strongly agree

17. **I am concerned about environmental problems because of the consequences for…** (Reser et al. 2012)*

    - plants
    - me
    - people in the community
    - marine life
    - my lifestyle
    - all people
    - birds
    - my health
    - children
    - animals
    - my future
    - future generations
    - Other

If you clicked on Other, please specify:

18. **I am concerned about the direct effects of various environmental threats such as:** (Reser et al. 2012)*

    - cyclones
    - floods
    - drought
    - heatwaves
    - lightening
    - water scarcity
    - health threats relating to environmental changes
    - species extinctions
    - threatened environmental quality and sustainability
    - severe storm activity
    - technological disasters
    - impacts of climate change

- global financial crisis
- unemployment
- serious health problems
- international conflicts and security threats
- crime
- family pressures
- Other

If you clicked on Other, please specify:

19. **The responsibility for taking action against climate change should be with:** (Reser et al. 2012)*
    - Environmental groups
    - Individuals and their families
    - Industry/ Companies
    - Local authorities
    - State Government
    - National Governments
    - The international community
    - None of these
    - Don't know
    - Other

If you clicked on Other, please specify:

20. **I know what climate change means.** (Rouhiainen, H., & Haanpää, L. 2023)

    1 strongly disagree - 2 disagree - 3 neutral - 4 agree - 5 strongly agree
21. **Is there anything you would like to say about your views on climate change, disasters or the environment which the survey has not addressed?** (Reser et al. 2012)*
22. **How long have you been involved in the YLCA project?**
23. **Have you received any climate change training before?**

Questions 24-28 were only added in the post-survey:

24. **I have changed the way I think about the seriousness of environmental problems because of climate change.** (Reser et al. 2012)*

    1 strongly disagree - 2 disagree - 3 neutral - 4 agree - 5 strongly agree
25. **Has the training changed your thinking about climate change and if so in what ways?**
26. **Do you feel more prepared to handle the project than before this training?**
27. **Would you say that participating in projects like this one helps you with dealing with climate concerns?**

28. In your opinion, what are the main benefits of working in a youth collective?

- Friendships
- It gives me more confidence to take action
- Being in an organised group means we will be more effective to influence change
- Allows me to express my concerns with peers
- Makes me feel more positive towards the future
- Other

If you clicked on Other, please specify:

Annex 2: Survey (Khmer)

For refere

For sources for questions see Annex 1 or Table 1 & 2

នេះជាការស្ទង់មតិ អំពីការយល់ឃើញពីការប្រែប្រួលអាកាសធាតុ
ហើយជាផ្នែកមួយនៃនិក្ខេបបទថ្នាក់អនុបណ្ឌិតនៅប្រទេសស៊ុយអែត។ គោលបំណងនៃការស្ទង់មតិនេះ
គឺដើម្បីស្វែងយល់ពីអារម្មណ៍របស់អ្នកអំពីការប្រែប្រួលអាកាសធាតុ
និងការចូលរួមរបស់អ្នកនៅក្នុងគម្រោងយុវជនដឹកនាំសកម្មភាពកាត់បន្ថយ
និងបន្សាំទៅនឹងផលប៉ះពាល់ពីការប្រែប្រួលអាកាសធាតុ ក្នុងខេត្តព្រៃវែង។
ចម្លើយរបស់អ្នកគឺទុកជាអនាមិក និងរក្សាទុកដោយអនុលោមតាមច្បាប់សុវត្ថិភាពទិន្នន័យអឺរ៉ុប។
ការចូលរួមរបស់អ្នក គឺជាការស្ម័គ្រចិត្ត ហើយអ្នកអាចបដិសេធមិនចូលរួមបាន។
អ្នកអាចរំលងសំណួរណាមួយដែលអ្នកមិនសប្បាយចិត្តក្នុងការឆ្លើយ។
ការរួមចំណែករបស់អ្នកជួយយើងឱ្យយល់ពីអារម្មណ៍របស់អ្នកចំពោះបញ្ហាប្រែប្រួលអាកាសធាតុ
និងផលប៉ះពាល់របស់វា និងថាតើអង្គការ ChildFund
និងអង្គការនានាអាចជួយគាំទ្រអ្នកបានយ៉ាងដូចម្តេចខ្លះ។ សូមអរគុណសម្រាប់ការចូលរួម!
ប្រសិនបើអ្នកមានសំណួរ ចង់ដឹងអំពីលទ្ធផល ឬដកទិន្នន័យរបស់អ្នក សូមទាក់ទងទៅកាន់អ៊ីម៉ែល៖
so7448ha-s@student.lu.se ។

1. **ភេទ**
    - ប្រុស
    - ស្រី
    - ផ្សេងៗ
2. **អាយុ**
3. **ឈ្មោះឃុំរបស់អ្នក**
    - កន្សោមអក
    - ពាមមន្ទារ
    - កំពង់ត្របែក
4. **ការប្រែប្រួលអាកាសធាតុនឹងមានផលប៉ះពាល់អាក្រក់យ៉ាងខ្លាំងដល់សុខភាពរបស់ខ្ញុំ (អំឡុងពេល២៥ឆ្នាំខាងមុខ)។**

    1 មិនយល់ស្របទាល់តែសោះ - 2 មិនយល់ព្រម - 3 ធម្មតា - 4 យល់ព្រម - 5 យល់ស្របជាខ្លាំង
5. **ការប្រែប្រួលអាកាសធាតុនឹងមានផលប៉ះពាល់អាក្រក់យ៉ាងខ្លាំងលើស្ថានភាពសេដ្ឋកិច្ច និងហិរញ្ញវត្ថុរបស់ខ្ញុំ (ក្នុងរយៈពេល២៥ឆ្នាំខាងមុខ)។**

    1 មិនយល់ស្របទាល់តែសោះ - 2 មិនយល់ព្រម - 3 ធម្មតា - 4 យល់ព្រម - 5 យល់ស្របជាខ្លាំង

6. **ការប្រែប្រួលអាកាសធាតុនឹងមានផលប៉ះពាល់អាក្រក់យ៉ាងខ្លាំងលើបរិស្ថានដែលគ្រួសារខ្ញុំ និងខ្ញុំកំពុងរស់នៅ (ក្នុងរយៈពេល 25 ឆ្នាំខាងមុខ)។**

1 មិនយល់ស្របទាល់តែសោះ - 2 មិនយល់ព្រម - 3 ធម្មតា - 4 យល់ព្រម - 5 យល់ស្របជាខ្លាំង

7. **ខ្ញុំជឿថាសកម្មភាពរបស់ខ្ញុំអាចនឹងមានឥទ្ធិពលលើរបៀបដោះស្រាយរបស់ខ្ញុំ គ្រួសារ និងសហគមន៍របស់ខ្ញុំ ទៅនឹងផលប៉ះពាល់នៃការប្រែប្រួលអាកាសធាតុ។**

1 មិនយល់ស្របទាល់តែសោះ - 2 មិនយល់ព្រម - 3 ធម្មតា - 4 យល់ព្រម - 5 យល់ស្របជាខ្លាំង

8. **ខ្ញុំជឿថាសកម្មភាពដែលខ្ញុំអាចអនុវត្តដើម្បីគ្រប់គ្រងផលប៉ះពាល់នៃការប្រែប្រួលអាកាសធាតុនឹងមានឥទ្ធិពលល្អទៅលើអារម្មណ៍ និងការគិតគូររបស់ខ្ញុំអំពីការប្រែប្រួលអាកាសធាតុ និងបញ្ហាបរិស្ថានជាទូទៅ។**

1 មិនយល់ស្របទាល់តែសោះ - 2 មិនយល់ព្រម - 3 ធម្មតា - 4 យល់ព្រម - 5 យល់ស្របជាខ្លាំង

9. **បញ្ហាបរិស្ថាននឹងមិនមានឥទ្ធិពលអវិជ្ជមានធ្ងន់ធ្ងរដល់មនុស្ស និងធម្មជាតិឡើយ។**

1 មិនយល់ស្របទាល់តែសោះ - 2 មិនយល់ព្រម - 3 ធម្មតា - 4 យល់ព្រម - 5 យល់ស្របជាខ្លាំង

10. **ខ្ញុំមិនបារម្ភពីបញ្ហាបរិស្ថានទេ។**

1 មិនយល់ស្របទាល់តែសោះ - 2 មិនយល់ព្រម - 3 ធម្មតា - 4 យល់ព្រម - 5 យល់ស្របជាខ្លាំង

11. **ចំពោះការប្រែប្រួលអាកាសធាតុ ខ្ញុំមានអារម្មណ៍ថា៖**

- ការព្រួយបារម្ភពីការប្រែប្រួលអាកាសធាតុ
  គួរតែត្រូវបានយកចិត្តទុកដាក់បន្ថែមទៀតឱ្យបានខ្លាំងក្លា
- ខ្ញុំព្រួយបារម្ភអំពីផលវិបាកពីការប្រែប្រួលអាកាសធាតុ
- វាជាបាតុភូតដែលបង្កគ្រោះថ្នាក់ដល់មនុស្ស និងធម្មជាតិ
- វាជាបាតុភូតដែលបង្កគ្រោះថ្នាក់ដល់មនុស្ស និងធម្មជាតិ
- វាមានតែផលល្អជាវិជ្ជមាននៅក្នុងពិភពលោករបស់យើង
- មានតែក្រុមមនុស្សនៅក្នុងកន្លែងផ្សេងទៀតនៃពិភពលោកប៉ុណ្ណោះដែលនឹងរងផលប៉ះពាល់ពីការប្រែប្រួលអាកាសធាតុ
- ការប្រែប្រួលអាកាសធាតុនឹងត្រូវបានបញ្ឈប់មិនឱ្យកើតមានទៀតឡើយ
- បច្ចេកវិទ្យានឹងជួយដោះស្រាយបញ្ហាប្រែប្រួលអាកាសធាតុនេះ។
- រាល់សកម្មភាពនីមួយៗនឹងអាចជួយធ្វើឱ្យមានភាពខុសប្លែកបាន។

12. **ប្រសិនបើយើងមិនធ្វើសកម្មភាពអ្វីមួយដើម្បីកាត់បន្ថយផលប៉ះពាល់អវិជ្ជមាននៃការប្រែប្រួលអាកាសធាតុនាពេលខាងមុខ ខ្ញុំគិតថាវានឹងក្លាយជាបញ្ហាធ្ងន់ធ្ងរសម្រាប់ប្រទេសកម្ពុជាយើង។**

1 មិនយល់ស្របទាល់តែសោះ - 2 មិនយល់ព្រម - 3 ធម្មតា - 4 យល់ព្រម - 5 យល់ស្របជាខ្លាំង

13. **ប្រសិនបើយើងមិនធ្វើសកម្មភាពអ្វីមួយដើម្បីកាត់បន្ថយផលប៉ះពាល់អវិជ្ជមាននៃការប្រែប្រួលអាកាសធាតុនាពេលខាងមុខ ខ្ញុំគិតថាវានឹងក្លាយជាបញ្ហាធ្ងន់ធ្ងរសម្រាប់ពិភពលោកទាំងមូល។**

1 មិនយល់ស្របទាល់តែសោះ - 2 មិនយល់ព្រម - 3 ធម្មតា - 4 យល់ព្រម - 5 យល់ស្របជាខ្លាំង

14. ខ្ញុំគិតថា ប្រទេសកម្ពុជានឹងចាប់ផ្តើមទទួលឥទ្ធិពលពីការប្រែប្រួលអាកាសធាតុនេះ៖

- យើងកំពុងទទួលរងផលប៉ះពាល់រួចហើយ
- ក្នុងរយៈពេល ១០ ឆ្នាំខាងមុខទៀត
- ក្នុងរយៈពេល ២៥ ឆ្នាំខាងមុខទៀត
- ក្នុងរយៈពេល ៥០ ឆ្នាំខាងមុខទៀត
- ក្នុងរយៈពេល ១០០ ឆ្នាំខាងមុខទៀត
- ក្នុងរយៈពេលលើស ១០០ ឆ្នាំខាងមុខទៀត
- នឹងមិនទទួលរងឥទ្ធិពលនោះទេ
- មិនដឹងទេ
- មិនមានយោបល់ទេ

15. ខ្ញុំមានការព្រួយបារម្ភអំពីបញ្ហាប្រែប្រួលអាកាសធាតុនេះ នៅពេលដែលខ្ញុំគិតថា ផលប៉ះពាល់ពីការប្រែប្រួលអាកាសធាតុ នឹងបង្កផលប៉ះពាល់មកលើរូបខ្ញុំផ្ទាល់។

1 មិនយល់ស្របទាល់តែសោះ - 2 មិនយល់ព្រម - 3 ធម្មតា - 4 យល់ព្រម - 5 យល់ស្របជាខ្លាំង

16. ខ្ញុំមានការព្រួយបារម្ភអំពីបញ្ហាប្រែប្រួលអាកាសធាតុនេះ នៅពេលដែលខ្ញុំគិតថា ផលប៉ះពាល់ពីការប្រែប្រួលអាកាសធាតុ នឹងបង្កផលប៉ះពាល់ដល់សង្គមទាំងមូល។

1 មិនយល់ស្របទាល់តែសោះ - 2 មិនយល់ព្រម - 3 ធម្មតា - 4 យល់ព្រម - 5 យល់ស្របជាខ្លាំង

17. ខ្ញុំមានការព្រួយបារម្ភអំពីបញ្ហាបរិស្ថានដោយសារវាមានផលវិបាកចំពោះ៖

- រុក្ខជាតិ
- ខ្លួនខ្ញុំ
- ប្រជាពលរដ្ឋនៅក្នុងសហគមន៍
- សភាវៈមានជីវិតក្នុងសមុទ្រ
- បែបបទនៃការរស់នៅរបស់ខ្ញុំ
- មនុស្សទាំងអស់
- សត្វបក្សី
- សុខភាពរបស់ខ្ញុំ
- កុមារ
- សត្វ
- អនាគតរបស់ខ្ញុំ
- មនុស្សជំនាន់ក្រោយ
- ផ្សេងទៀត

ប្រសិនបើអ្នកចុចលើផ្នែកផ្សេងទៀត សូមបញ្ជាក់

18. ខ្ញុំព្រួយបារម្ភជាខ្លាំងអំពីផលប៉ះពាល់ដោយផ្ទាល់ពីការគំរាមកំហែងផ្នែកបរិស្ថានជាច្រើន ដូចជា៖

- ព្យុះស៊ីក្លូន
- ទឹកជំនន់
- គ្រោះរាំងស្ងួត
- រលកកំដៅ
- រន្ទះបាញ់
- កង្វះទឹក
- ការគំរាមកំហែងដល់សុខភាពទាក់ទងនឹងការប្រែប្រួលបរិស្ថាន
- ការផុតពូជនៃប្រភេទសត្វ
- ការគំរាមកំហែងដល់គុណភាពនិងនិរន្តរភាពបរិស្ថាន
- ខ្យល់ព្យុះធ្ងន់ធ្ងរ
- គ្រោះមហន្តរាយបច្ចេកវិទ្យា
- ផលប៉ះពាល់ពីការប្រែប្រួលអាកាសធាតុ
- វិបត្តិហិរញ្ញវត្ថុជាសកល
- ភាពអត់ការងារធ្វើ
- បញ្ហាសុខភាពធ្ងន់ធ្ងរ
- ជម្លោះអន្តរជាតិ និងការគំរាមកំហែងដល់សន្តិសុខ
- ឧក្រិដ្ឋកម្ម
- សម្ភាធគ្រួសារ
- ផ្សេងទៀត

ប្រសិនបើអ្នកចុចលើផ្នែកផ្សេងទៀត សូមបញ្ជាក់

19. ទំនួលខុសត្រូវក្នុងការចាត់វិធានការទប់ទល់នឹងការប្រែប្រួលអាកាសធាតុគួរតែធ្វើដោយ៖

- ក្រុមការងារផ្នែកបរិស្ថាន
- បុគ្គល និងក្រុមគ្រួសាររបស់ពួកគេ
- ឧស្សាហកម្ម ឬក្រុមហ៊ុន
- អាជ្ញាធរមូលដ្ឋាន
- រដ្ឋាភិបាលថ្នាក់ក្រោមជាតិ
- រដ្ឋាភិបាលថ្នាក់ជាតិ
- សហគមន៍អន្តរជាតិ
- មិនមែនជាក្រុមទាំងអស់ដូចរៀបរាប់ខាងលើទេ
- មិនដឹង
- ផ្សេងទៀត

ប្រសិនបើអ្នកចុចលើផ្នែកផ្សេងទៀត សូមបញ្ជាក់

20. ខ្ញុំយល់ដឹងអំពីអត្ថន័យនៃការប្រែប្រួលអាកាសធាតុ។

1 មិនយល់ស្របទាល់តែសោះ - 2 មិនយល់ព្រម - 3 ធម្មតា - 4 យល់ព្រម - 5 យល់ស្របជាខ្លាំង

21. តើមានអ្វីដែលអ្នកចង់និយាយ ឬមានយោបល់លើកឡើងអំពីការប្រែប្រួលអាកាសធាតុ គ្រោះមហន្តរាយ ឬបរិស្ថាន ដែលការស្ទង់មតិនេះមិនបានលើកឡើងទេ?

22. តើអ្នកបានចូលរួមក្នុងគម្រោងយុវជនដឹកនាំសកម្មភាពកាត់បន្ថយ និងបន្សាំទៅនឹងផលប៉ះពាល់ពីការប្រែប្រួលអាកាសធាតុ យូរប៉ុណ្ណា?

23. តើអ្នកធ្លាប់បានទទួលការបណ្តុះបណ្តាលពីការប្រែប្រួលអាកាសធាតុដែរឬទេ បើសិនធ្លាប់មានក្នុងបរិបទ ឬគម្រោង អ្វី?

Questions 24-28 were only added in the post-survey:

24. ខ្ញុំបានផ្លាស់ប្តូររបៀបនៃការគិតរបស់ខ្ញុំអំពីភាពធ្ងន់ធ្ងរនៃបញ្ហាបរិស្ថានដែលបង្កដោយសារការប្រែប្រួលអាកាសធាតុ។

1 មិនយល់ស្របទាល់តែសោះ - 2 មិនយល់ព្រម - 3 ធម្មតា - 4 យល់ព្រម - 5 យល់ស្របជាខ្លាំង

25. តើការបណ្តុះបណ្តាលបានផ្លាស់ប្តូរការគិតរបស់អ្នកអំពីការប្រែប្រួលអាកាសធាតុដែរឬទេ ហើយប្រសិនបើដូច្នេះតើផ្លាស់ប្តូរតាមវិធីណាខ្លះ? ចូររៀបរាប់

26. តើឥលូវនេះ អ្នកមានអារម្មណ៍ថាអ្នកមានការត្រៀមខ្លួនបានល្អជាងមុនដែរឬទេ ដើម្បីចូលរួមអនុវត្តគម្រោងនេះ បើប្រៀបធៀបទៅនឹងពេលដែលអ្នកមិនទាន់ទទួលបានការបណ្តុះបណ្តាលនេះ?

27. តើអ្នកអាចនិយាយបានថា ការចូលរួមក្នុងគម្រោងនេះជួយឱ្យអ្នកអាចដោះស្រាយទៅក្តីបារម្ភ ឬបញ្ហាពីការប្រែប្រួលអាកាសធាតុបានដែរឬទេ?

28. តាមគំនិតរបស់អ្នក តើអ្វីជាអត្ថប្រយោជន៍ចម្បងនៃការចូលរួម ឬធ្វើការជាក្រុមជាមួយយុវជន៖

- បង្កើតមិត្តភាព
- វាធ្វើឱ្យខ្ញុំមានទំនុកចិត្តបន្ថែមទៀតដើម្បីធ្វើសកម្មភាព
- នៅពេលដែលយើងមានក្រុមដែលមានការរៀបចំបានត្រឹមត្រូវ គឺមានន័យថាយើងទទួលបានការស្គាល់ជាងមុនក្នុងការធ្វើការប្រកបដោយប្រសិទ្ធភាព ក្នុងការបង្កើតឱ្យមានការផ្លាស់ប្រែទៅបាន។
- វាជួយឱ្យខ្ញុំអាចប្រាប់ពីទុក្ខកង្វល់របស់ខ្ញុំឱ្យមិត្តភក្តិបានដឹង។
- វាធ្វើឱ្យខ្ញុំមានអារម្មណ៍រំជួលមានទៅថ្ងៃអនាគត។
- ផ្សេងទៀត

ប្រសិនបើអ្នកចុចលើផ្នែកផ្សេងទៀត សូមបញ្ជាក់

Annex 3: Focus Group Discussion Questions

1. **What does Climate Change mean to you?**
2. **How does Climate Change influence the day-to-day life of Youth in your communities?**

- If they don't know what to talk about ask them about weather/disasters and if they ever think about the long-term effects Climate Change could have on them (i.e. the number of hazards will increase every year...)

3. **What influences the level of climate change concern of Youth in your communities? What increases it and what could lower it and why?**

- If they don't know what to talk about ask them how they would feel if they got new information about how climate change is affecting their communities or them spending time outside in nature

4. **What are the reasons for your participation in this project? Are they related to Climate Change?**
5. **Do you think your Climate change concerns would be lower or higher if you did not participate in this project and why?**
6. **In the survey most Youth said that actions I can take to manage the impacts of climate change have a positive influence on how I am feeling and thinking about climate change and environmental issues generally. What are examples of actions you are taking or could take?**

- If they do not know what to talk about give examples like spending time in nature, talking with friends and family about climate change, participating in projects like this one…

7. **Did the training about Climate Change you had two weeks ago influence the projects you now want to do?**

- i.e. a change in focus from DRM to CC

8. **Are there any barriers to being active in DRM in your community?**

- maybe regarding gender or age?

Annex 4: Fornell-Larcker criterion tables

Fornell-Larcker criterion table pre-survey

	Knowledge-Index	Affectedness-Index	Action-Index	Concern-Index
Knowledge-Index				
Affectedness-Index	.437	.753		
Action-Index	.511	.597	.824	
Concern-Index	.513	.545	.549	.642

Fornell-Larcker criterion table post-survey

	Knowledge-Index	Affectedness-Index	Action-Index	Concern-Index
Knowledge-Index				
Affectedness-Index	.423	.729		
Action-Index	.132	.110	.765	
Concern-Index	.411	.400	.292	.741

The square roots of the AVEs on the diagonal are more than the ones on the off-diagonal providing sufficient discriminant validity.