Project Update: May 2019

The awareness campaign on "A community education programme to curb direct pollution of amphibian breeding sites in eastern Bhutan with particular reference to threatened *Amolops himalayanus*" was successfully carried out with the help of Kencho Thinley and Namgay Rinchen of III and II year BSc. Life Science Programmes of Sherubtse College, Royal University of Bhutan. 528 students of Jigme Sherubling Central School Campus II, Pam Community Primary School of Trashigang district and Bayling Central School of Tashiyangtse district participated in awareness workshop organized in their respective schools.

The workshop primarily focused on the importance of the amphibian breeding site especially of the threatened *Amolops himalayanus*. They are also given an insight into what species of frogs are around in their campus and in Bhutan in general. Since the breeding site of *Amolops himalayanus* is in the stream fed by the waste water from schools and community around, the alternative way of purification of waste water which is eco-friendly and cheap to construct, constructed wetland, is suggested for the people. The negative impact of using polluted water, both short and long term affects are also highlighted in the presentation.

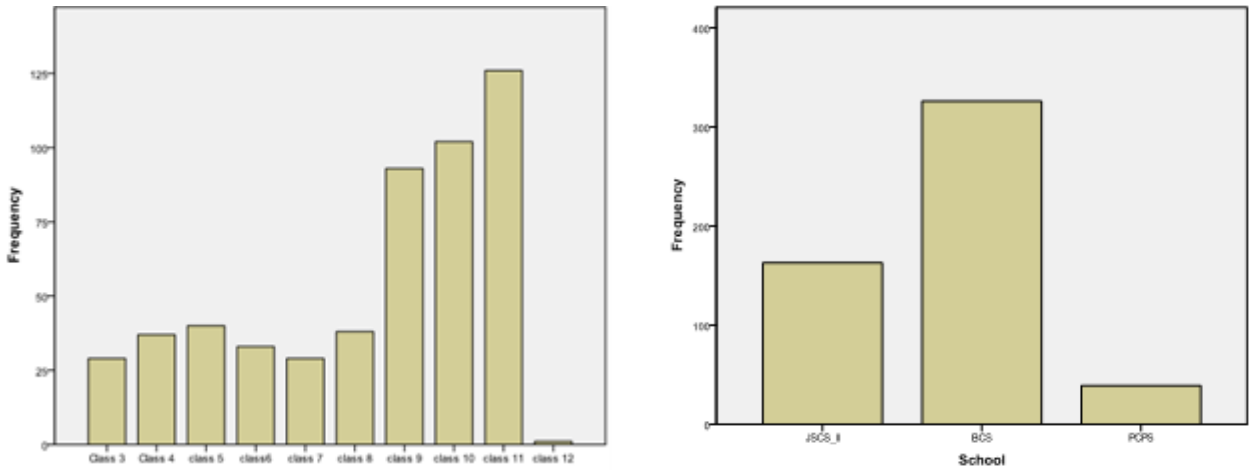
At the end of the presentation we also conducted a questionnaire survey to find out how aware the students are about the amphibians and frogs. The questionnaire included general questions like Do you know what amphibian is. Do you know what frog is? Have you seen a frog? What do you know about frog? It also includes some of the biological aspects like what frogs eat, where they live, where they lay eggs? The role of culture and folk tales are also explored in the conservation and awareness of frogs in Bhutan. The set of question includes, do you know any story on frog? Where did you learn the story from? Who narrated you the story and in which language or dialect did you learn the story?

Left: Kencho Thinley presenting to the students of Jigme Sherubling Central School Campus II. Right: Students helping each other while filling the questionnaire at Jigme Sherubling Central School Campus II.

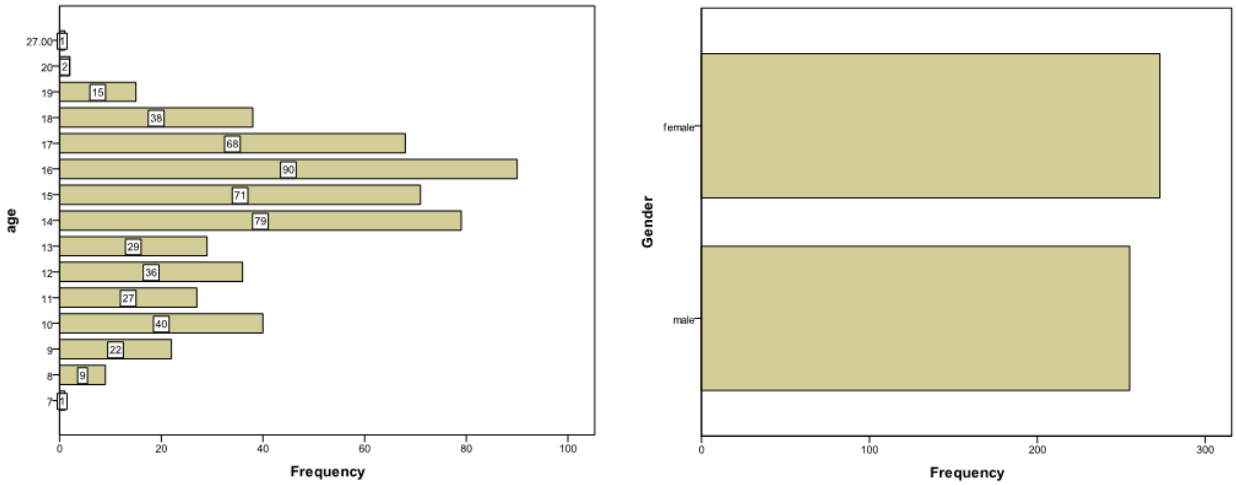
Figure: Students helping each other while filling the questionnaire at Bayling Central School, Tashi Yangtse.

General statistics

Total students involved in seminar is 608 (male 295, 48.5%; female 313, 51.5%), only data of 528 (male 255, 48.3%; female 273, 51.7%), could be used due to missing data especially of the age. This missing data did make much difference in the statistical analysis where change in the gender and age ratio is almost negligible with the change of 0.2 in both the genders. Of all 204 (38.6%) students were of educated parents and 324 are of uneducated parents (61.4%). The involved classes ranged from 3 to X+II with highest enrollment in class X+I, however, class X+II students were not involved in the survey except one female leader for co-ordination. Age ranged from 7 years to 27 years old with peak number in the age of 16. According to our data more number of females (313; 51.5%) was enrolled in school than males (295; 48.5%).



Left: Class frequency in all three schools. Right: Frequency in each school



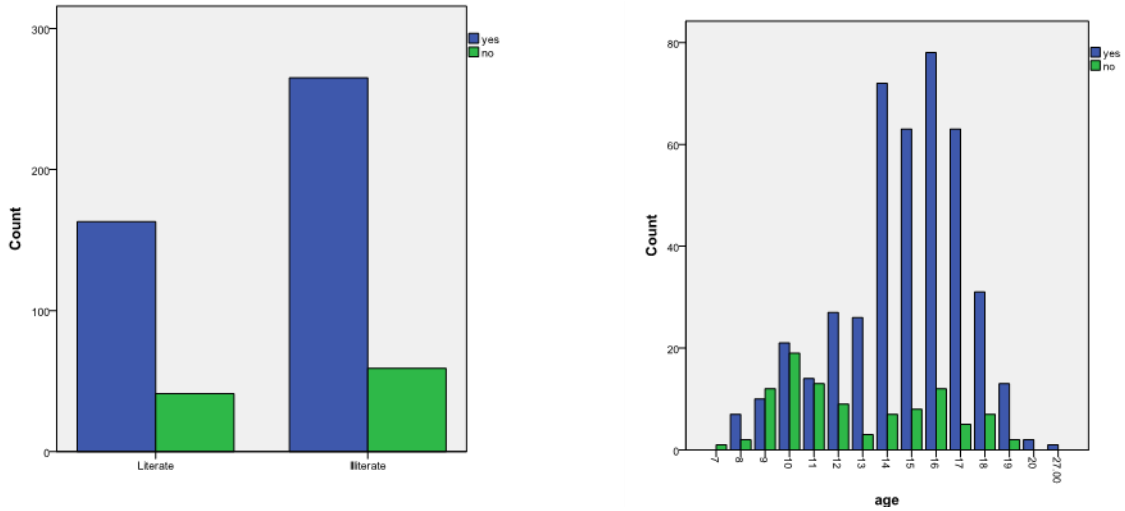
Left: Frequency by age in all schools. Right: Frequency by gender in all school.

Awareness of amphibian

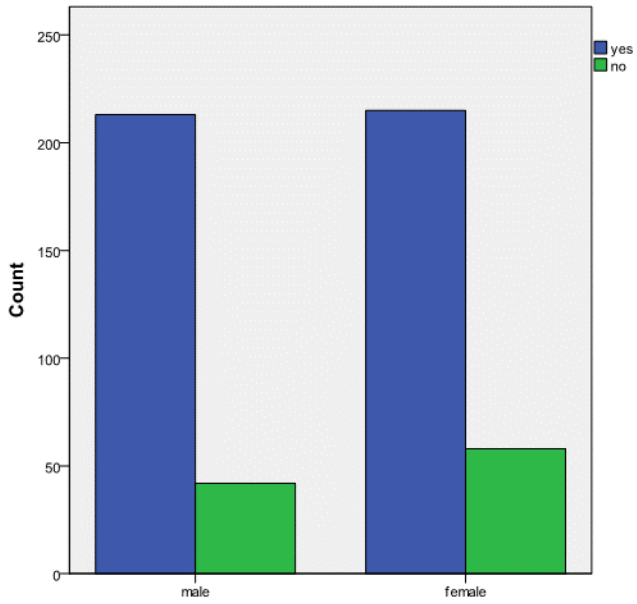
Analysis: cross-tabulation analysis, two-tailed test Pearson Chi-square test.

Do you know what amphibian is? Between the children of literate and illiterate parents, genders and age.

The children of illiterate parents know amphibian better than literate parent's children. However, the two-tailed chi-square tests shows no significant difference (p=0.648). Out of 255 males, 213 and of 273 females, 215, knows what amphibian is, however, Pearson Chi-square test shows no difference (p=0.162) in the awareness of amphibian between male and female students. Age group considered is 7-27 years old where more number of students are concentrated in the age of 16 (90 students) and least in the age of 7 and 27 (1 student each). Out of 528 students 428 knew amphibian and 100 do not know amphibian and the difference is significant (p=0.00).



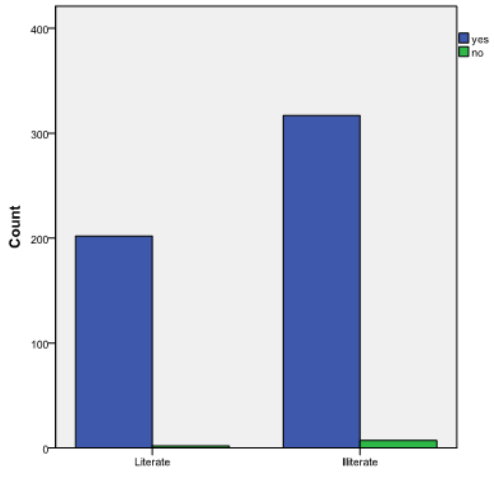
Left: Comparison of children of illiterate parents literate in amphibian awareness. Right: Age frequency of amphibian awareness.

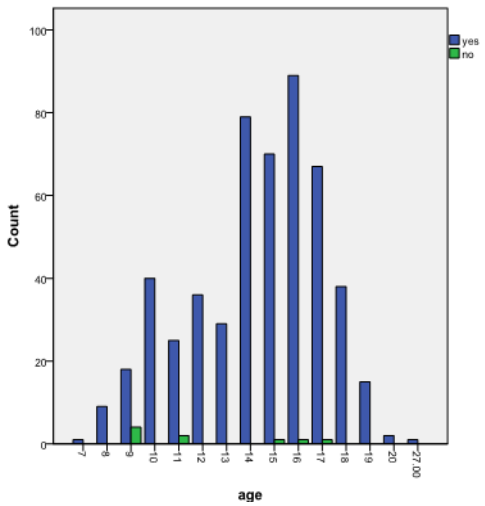


Frequency of by gender amphibian awareness

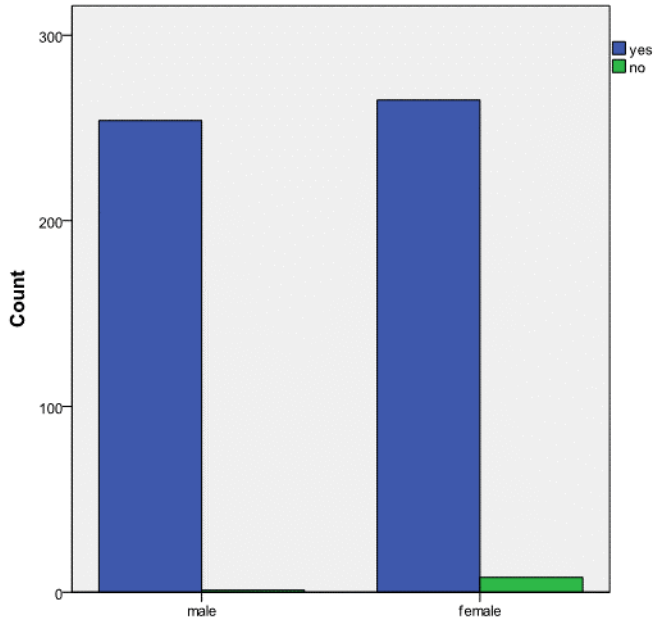
Do you know what frog is? Between the children of literate and illiterate parents, genders and age.

Of the 204 children of literate parents, 202 and of 324 children of illiterate parents, 317 knows what frogs is, however, two tailed Pearson Chi-square tests show no difference (p=0.308) in knowing the frog. Of the 273 females, 265 and of 255 males, 254, knows what frog is. However, two tailed Pearson Chi-square tests shows significant difference (p=0.024) between the male and female in terms of frog awareness. Age group considered is 7-27 years where more number of students are concentrated in the age of 16 (90 students) and least in the age of 7 and 27 (1 student each). Out of 528 students 519 knew what frog is and it is significant statistically (p=0.00).





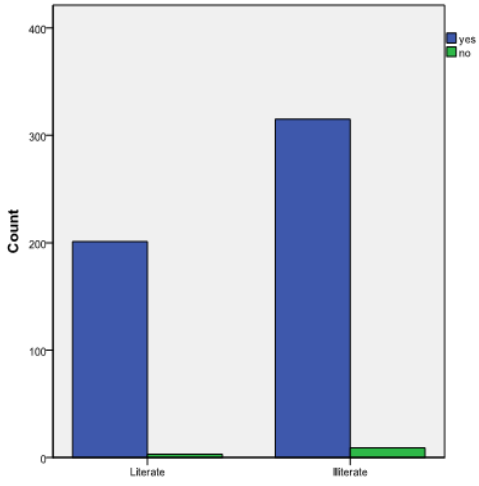
Left: Parents literate in frog awareness. Right: Age frequency of frog awareness.

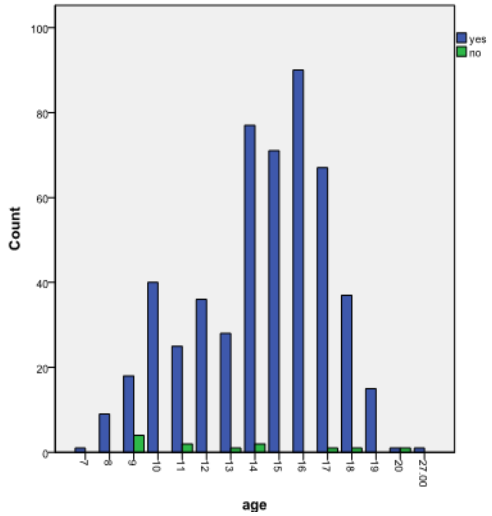


Frequency of by gender frog awareness

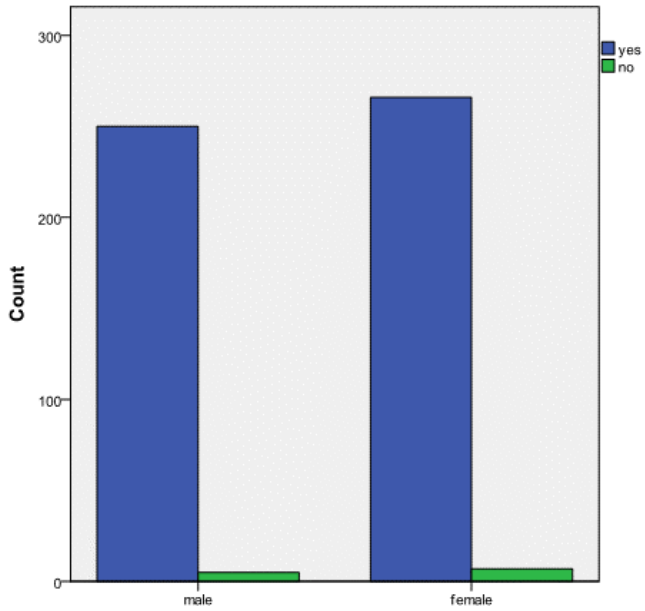
Have you seen a frog? Between the children of literate and illiterate parents, genders and age.

201 and 315 children of literate and illiterate parents respectively have seen the frog. However, chi-square test shows no significant difference (p=0.326) between the children of literate and illiterate parents in seeing the frog. With respect to genders, 250 male and 266 female students have seen the frog but statistically not significant (p=0.642) between the male and female students. From the age of 7-27 years, 516 have seen the frog where only 12 did not, which is significant (p=0.00) statistically.





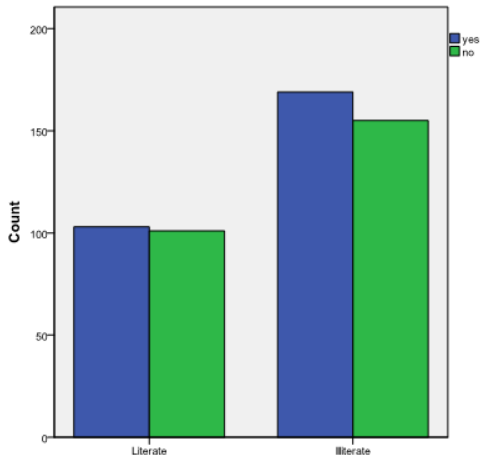
Left: Comparison of children of illiterate parents literate in seeing the frog. Right: Age frequency of seeing the frog.

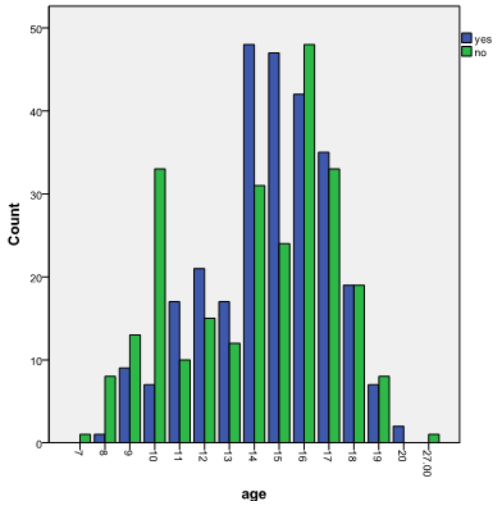


Frequency of by gender in seeing the frog

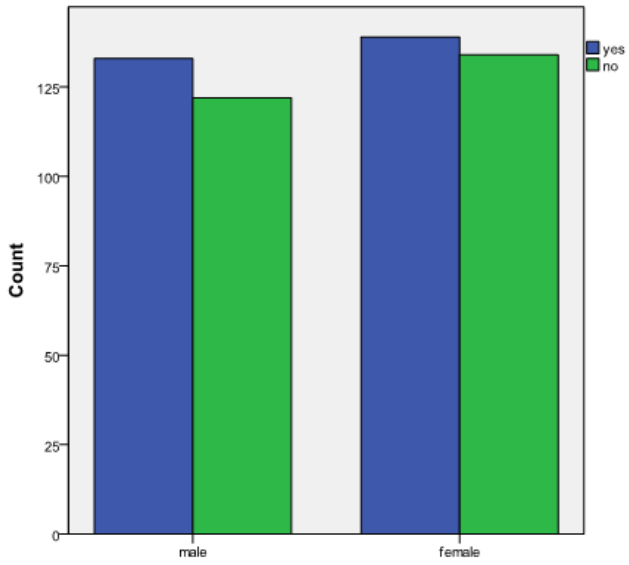
Is frog important for us? Between the children of literate and illiterate parents, genders and age.

103 students of literate parents and 169 students of illiterate parents said yes. However, it is statistically not significant (p=0.708). Regarding the gender, 133 males and 139 females responded as yes, however, it is not significant statistically (p=0.776). From the age of 7-27, 272 students said yes and 256 said no with the p-value<0.00.





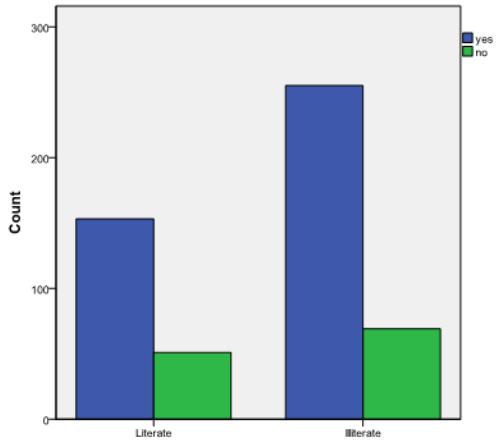
Left: Comparison of children of illiterate parents literate on importance of frog. Right: Age frequency of importance of frog.

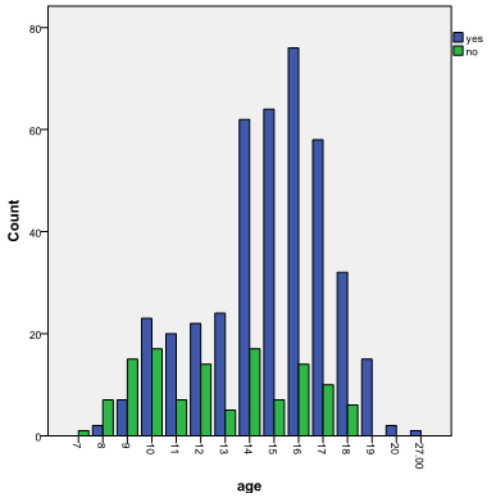


Frequency of by gender on importance of frog

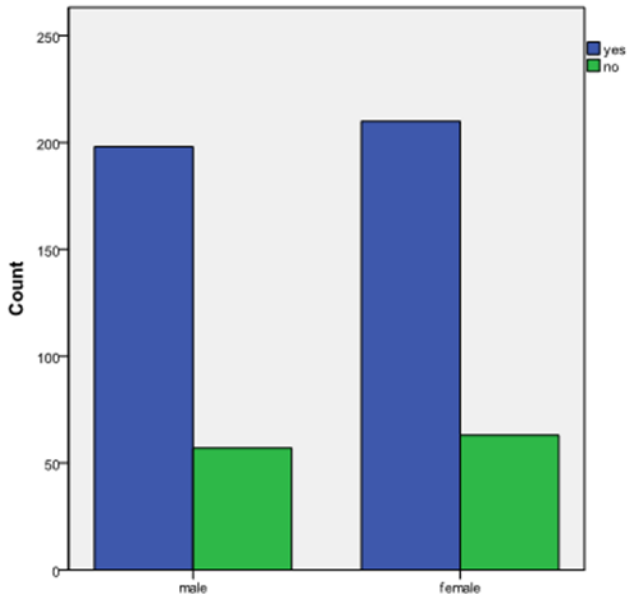
Is frog important for nature? Between the children of literate and illiterate parents, genders and age.

153 children of literate and 255 children of illiterate parents responded yes however, two tailed chi-square test show no significant difference (p=0.323). 198 males and 210 females responded yes however, it is not statistically significant (p=0.843). From the age of 7-27, 408 students responded yes and 120 no with the difference statistically significant (p<0.00).





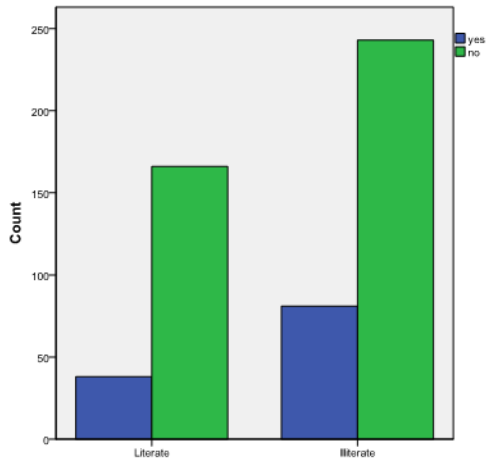
Left: Comparison of children of illiterate parents literate on importance of frog for nature. Right: Age frequency of importance of frog for nature.

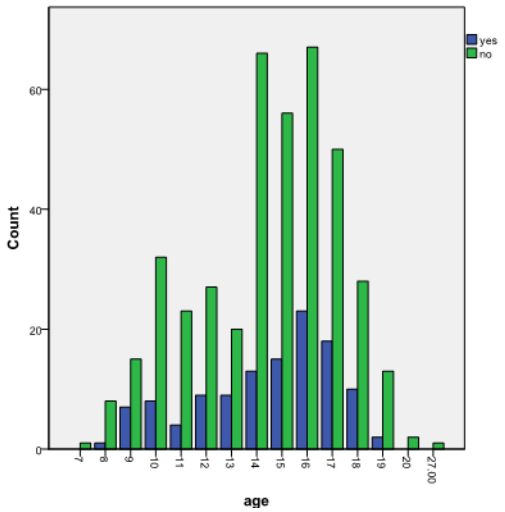


Frequency of by gender on importance of frog for nature

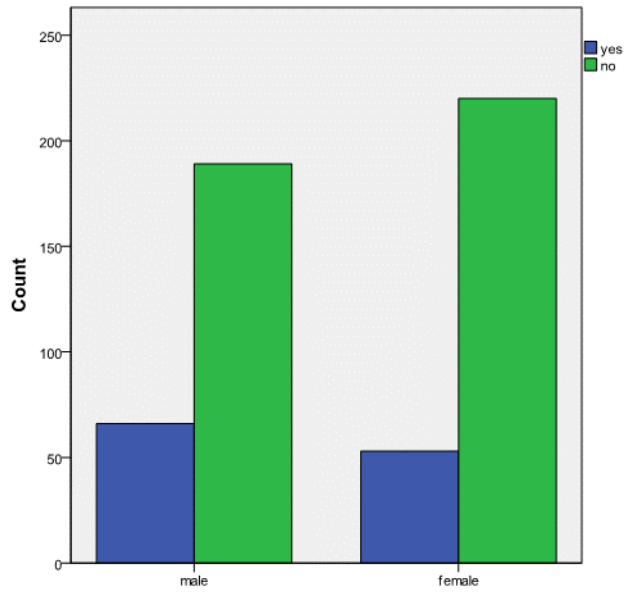
Do you like frog? Between the children of literate and illiterate parents, genders and age.

38 students of literate parents responded yes and 166 no, 81 students of illiterate parents said yes and 243 responded no. however, it is not statistically significant (p=0.088). Majority of both male and female students do not like frog (male: 189; female: 220) however, it is statistically not significant (p=0.075). From the age of 7-27, 410 responded yes and 119 responded no, however, it is not significantly different (p=0.819).





Left: Comparison of children of illiterate parents literate on perception of frog. Right: Age frequency of perception on frog.



Frequency of by gender on perception of frog

Role of culture in amphibian awareness

389 students responded yes (male: 182; female 207) and 139 no (male: 73; female: 66) with highest in class X+I (97 students) and at the age of 16 years (90 students). Pearson Chi-square test also showed that the difference is statistically significant (p=0.002). When the students are asked whether the stories are in the textbook between the age of 7-27, 216 responded yes and 311 no, which is also statistically significant (p=0.001). When compared between the gender, both male and female agrees that they did not learn the stories from the textbook, where more number of students responded no (male: 144; female: 167). However, Pearson Chi-square test shows the difference is not significant (p=0.324). The children of literate and illiterate parents also agree that they did not learn stories from the textbook (literate parents 129, illiterate parents 183), however, it is not statistically significant (p=0.214). It is also found that the source of stories are grand parents', parents, brothers, sisters, teachers, friends, internet, library and books. However, teacher is found to play the major role where 244 students learnt the stories from their teachers and most of the class X+I (49 students) responded as learnt for their teachers. Dzongkha played the major role, where 276 students learnt the stories in Dzongkha language followed by English (217 students). Local dialects like Sharchopkha, Lhotsham Kha and Dzalakha are found to play less role.

Fieldwork and training

On 11th May, 2019, a team comprised of Tshering Nidup, Nob Tshering Lepcha, Kencho Thinley and Namgay Rinchen visited Bamri Drang at night to survey the amphibian species and train the students in the sampling and study of Amphibia. Students were taught how to conduct visual encountering survey specifically and to collect DNA samples for phylogenetic study. They were also taught to preserve specimen and tissue samples for future study, record data, how to hunt for the frogs and other field related techniques.

During the survey, we could find 3 individuals (2 female and 1 male) of *Amolops* species which is similar to *Amolops himalayanus*. We collected DNA samples from all the three

individuals. The frog species that are emerged this season includes *Megophrys* sp., *Philautus* sp. and *Amolops himalayanus*, however, we could not find these species in the site.

Way forward

In the next visit to other field I will train them on how to collect skin swab for the study of Chytrid fungi.

Amolops sp.