Project Update: November 2018

In the previous update report, results obtained from the nest preparation and incubation stage regarding the breeding biology of Indian spotted eagle was presented. In this update report, findings during the chick rearing and fledgling stages are presented. One of the pairs of Lumbini (Nest "C") has failed to hatch their egg/s, monitoring of the same nest was done to determine if the pair has again laid the egg/s in the nest. The breeding pair weren't observed in the nest, not even at the periphery of the nesting trees during one whole observation period. Nest "A" and "B" of Lumbini were monitored twice i.e. 11th-18th June (8 days) and 26th June-2nd July (7 days) during the chick rearing period. Both of the above mentioned nests were observed at the same time (two researchers/ nest). Nest "E" from Koshi and Nest "D" of Dhanusa were visited at 20th of June to check if the egg/s has hatched. Koshi's pair was found still incubating the egg/s while the nest located at Dhanusa was found to be empty. The two researchers monitored the nest of Dhanusa whole day and didn't find the breeding pair even at the periphery of the nest. The Koshi's nest (Nest "E") was monitored twice i.e. 4th-11th July for 8 days and 7th-13th of August for 7 days later on. Each of the nests was monitored from 07:00-18:00 hrs. using camouflaged hide.

Photo 1 - Researcher Sandesh Gurung inside the camouflaged hide monitoring the nest during chick rearing stage. ©Dheeraj Chaudhary.

During the whole observation, only a male was recorded actively delivering the prey to the chick in the nest. During our observation the female was found in the nest when the eaglet get recently hatched from the eggs. As the eaglet grew bigger parents were found sitting nearby the branches of the nesting trees or trees nearest to the nesting tree rather on the nest. Only male were observed delivering the food items to the eaglet while female played active role to feed the delivered food to the eaglet. Of total 15 days observation, the male of nest "A","B" and "C" recorded delivering the prey items 36, 34 and 34 times for the eaglet (Fig 1). Frog (58.65%) was the major prey items followed by rodents (22.12%), birds (14.42%) and lizards (2.88%) was least sighted during the observation period. It was twice the prey items couldn't be identified (1.92%).

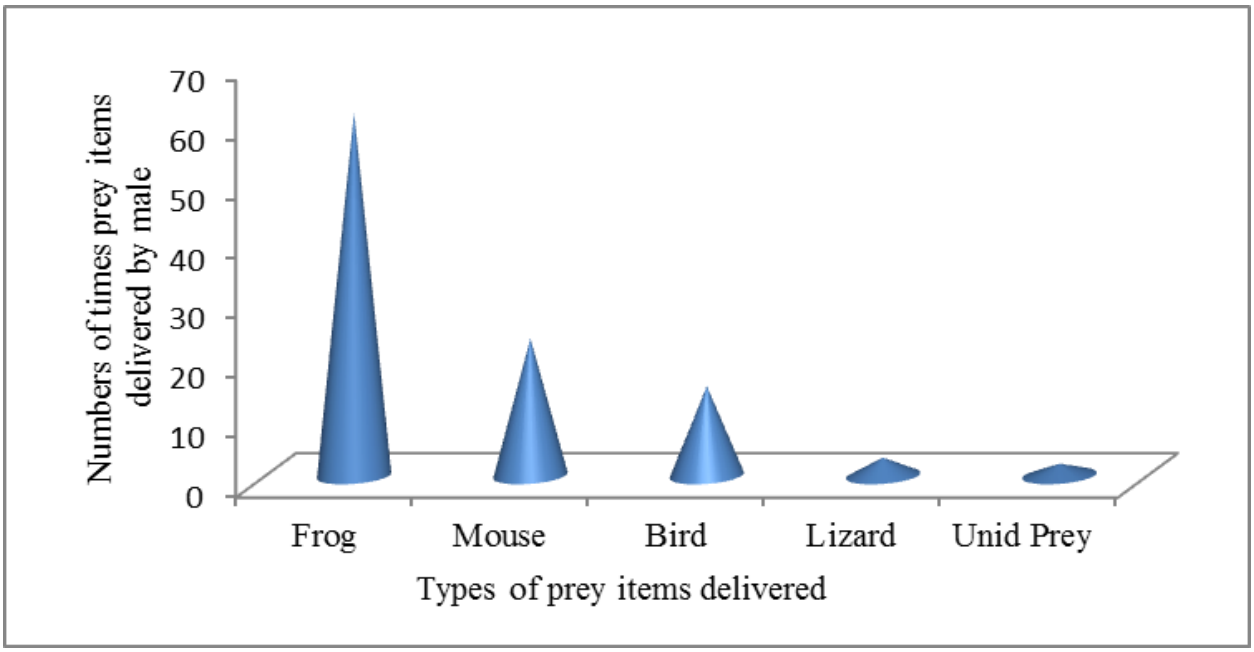

Fig 1: Prey items delivered in the nest by male for the eaglet

The prey items brought up by the male in the nest were recorded on hourly basis. The most preferred time periods to feed the eaglet were found between 08:00-09:00 am and 16:00-17:00 pm while 18:00-19:00 was preferred least (Fig 2).

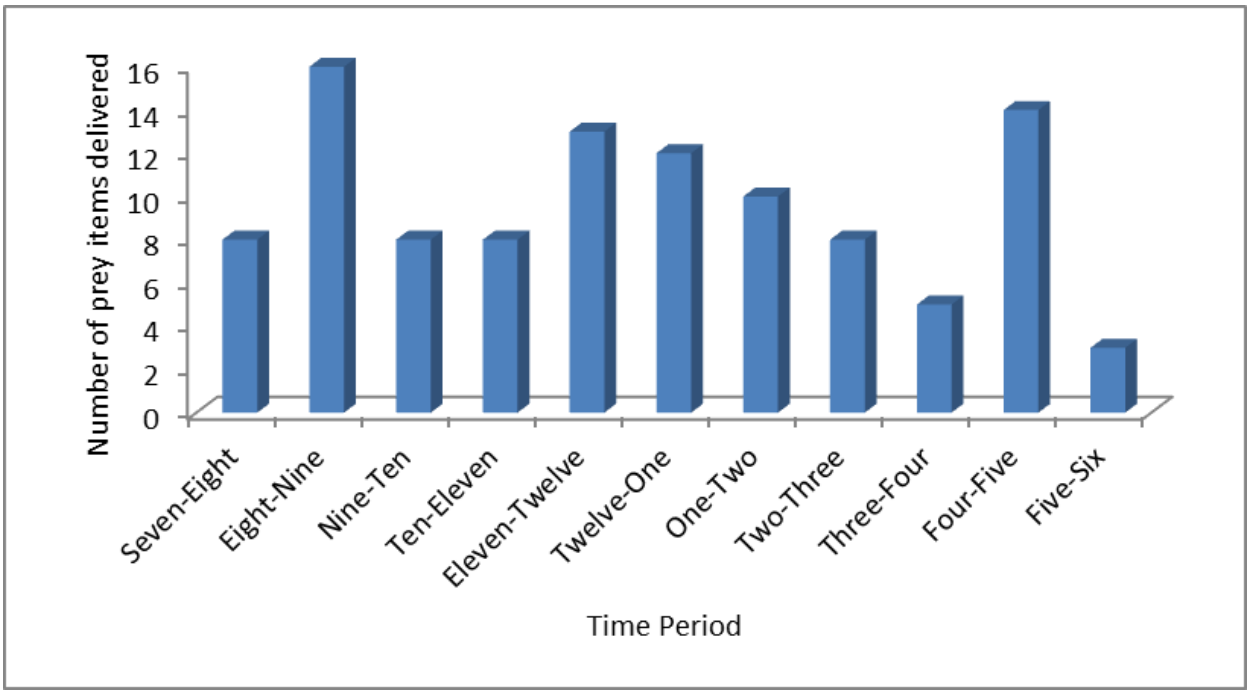

Fig 2: Prey items delivered to the eaglet recorded on hourly basis

On 5th August 2018, an assumption that the eaglet from the nest "A" would fledge was made, thus the nest "A" was monitored. The nest was found empty. Later on, a few crows were observed chasing the eagle. From the careful observation, it was found that the crows were chasing the fully fledged juvenile Indian spotted eagle (Photo 2). Then the chased eagle was assumed to be the offspring of nest "A". Meanwhile monitoring of the nest "B" was done. The eaglet wasn't visible for the whole day. During this time the eaglet should have been big enough to be easily seen in the nest. Thus suspicion about something wrong in the nest "B" was made. We went in the nesting tree and climbed up in the tree. Dead eaglet in the nest was found (Photo 3).

Due of the highly mobility of the fully fledged juvenile eagle fledgling stage couldn't be accomplished. They just flew at farther distance and to monitor fully fledged eagle weren't possible.

Left: Photo 2 - Fully-fledged juvenile Indian Spotted Eagle of nest "A" chased by the crow. Right: Photo 3 - Dead eaglet in the nest "B" of Lumbini.

In September 2018, the nest "E" in the Koshi was monitored. An estimation about the young eaglet would fledged at this month was made. During the visitation in the study site, a fully-fledged Indian spotted eagle near to the nesting tree was observed (Photo 4). Single chick was found in the nest of Indian spotted eagle.

Photo 4 - Fledged Indian Spotted Eagle of Koshi, Nest E. ©Hari Basnet.

Questionnaire Survey

Since the cause of the decline of the Indian spotted eagle is unknown, a questionnaire survey was conducted. A structured questionnaire survey with key informants, mainly farmers residing near to the nesting area of Indian spotted eagle, was done. The questionnaire survey from 7th-10th August in Lumbini, 12th-15th August in Dhanusa and 17th-20th August in Koshi was done mainly at the human settlement nearest to the nesting site. Four days were taken on each site to acquire 40 questionnaires. The participants were mainly questioned related to the perception of people towards raptors, hunting, killing, persecution, egg snatching, nest destruction, probable presence of carnivore, measurement of rodenticides, pesticides, insecticides and chemical fertilizers too. The deforestation rate and establishment of human infrastructure rate were questioned too.

Out of 120 samples of questionnaire collected from key-informants, 84 were found to be traditional types of farmers while 33 were found to be modern farmers while three were reported to be emerging farmers. On gender basis, 97 respondents were male while 23 were female. Categorisation of the age group of farmers showed that the main respondents were between the age of 40-60 years comprising of 56.7%, 30-40 years comprised of 31.7%, 60 years above comprised of 10% while 18-30 years comprised of 1.6% (Fig: 3).

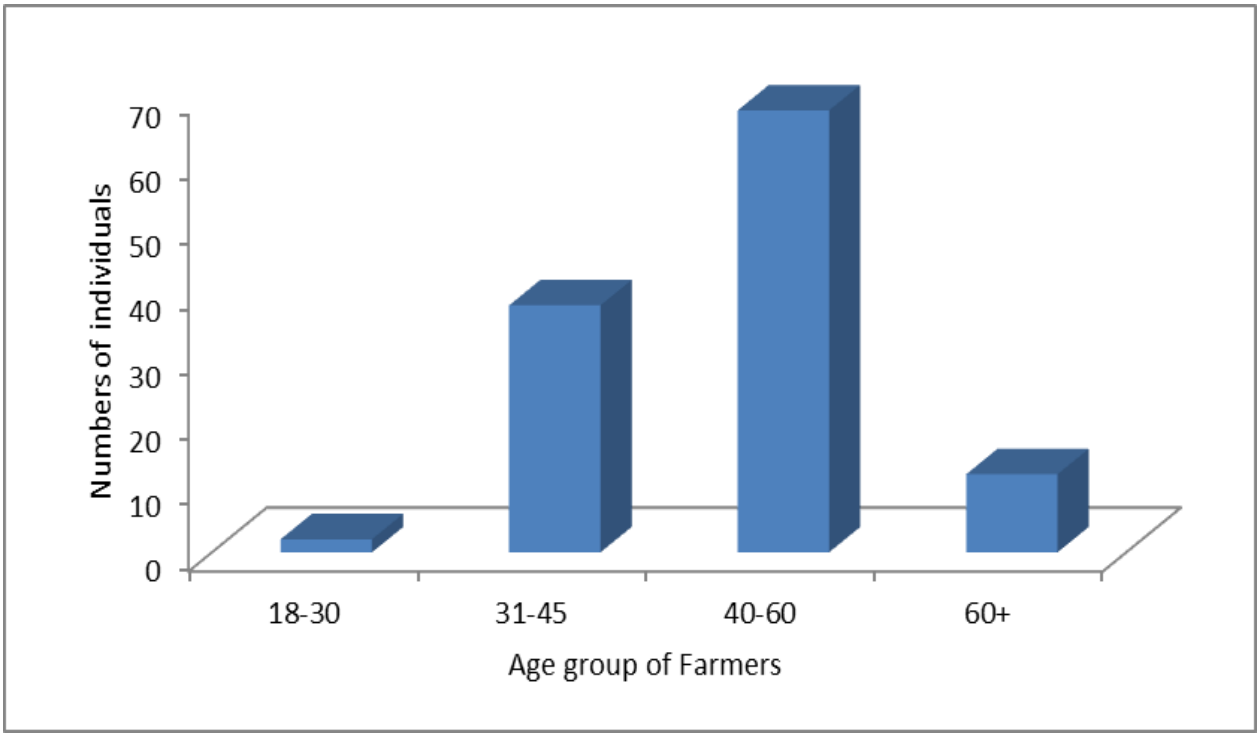

Fig 3: Categorisation of age group of key-informants and numbers of respondents

Data for the determination of the dependency percentage of the people on agriculture was recorded. Out of 120 respondents from three sites, 90 respondents have

their yearly income more than 90% from the agriculture while two respondents were found to have about 20-40% of their annual income obtained from farming (Fig: 4).

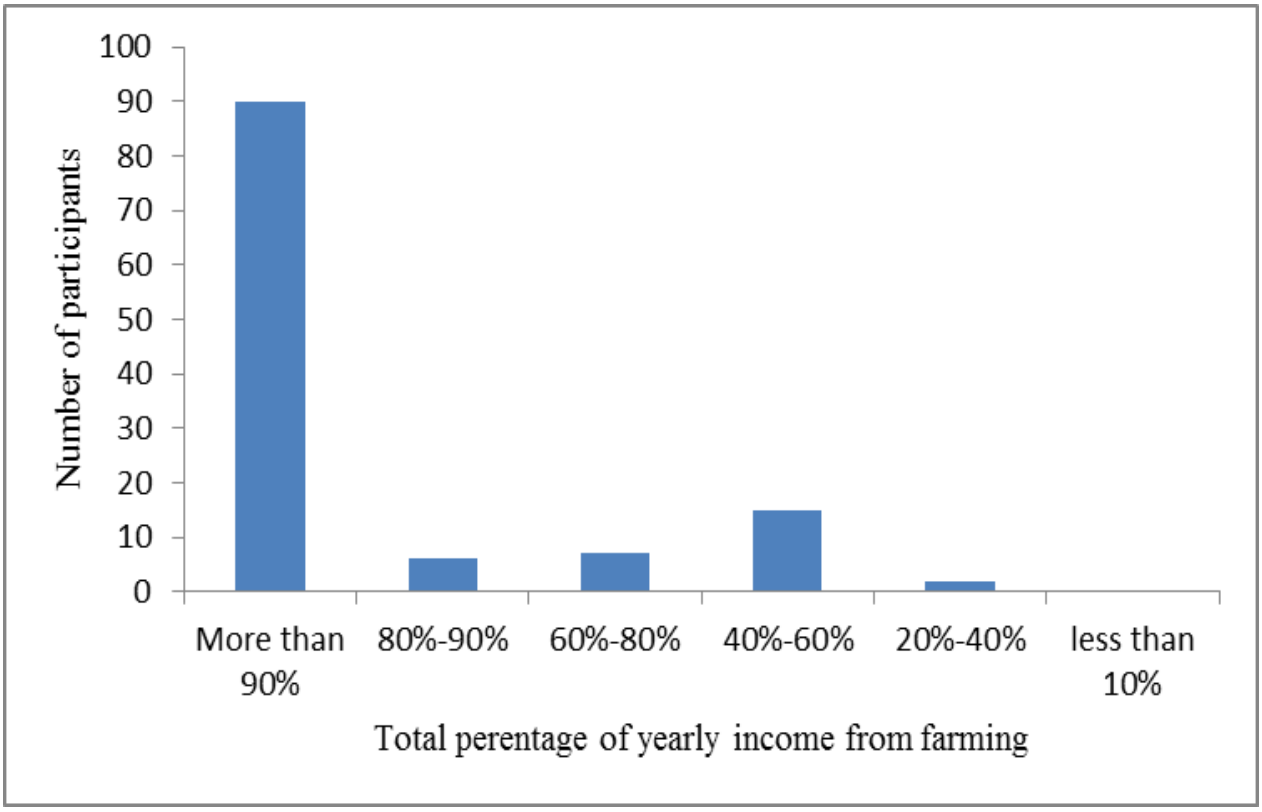

Fig 4: Annual income of the farmers from the farming

Questions were designed in the questionnaire to understand the perception of people towards raptors. Out of 120 respondents, 95% of the respondents didn't like to see the raptors in their farmland while 5% decided to stay neutral. 92.5% didn't prefer to share their farmland with raptors while 7.5% didn't mind at all. A statement "The presence of raptors in the farmland reduces its value" was included in the questionnaire, 19 respondents showed disagreement with the statements, 25 respondents decided to stay neutral (they ticked on the option "Don't have Answer", 47 agreed the statements while 29 respondents replied "may or may not be" (Fig 5).

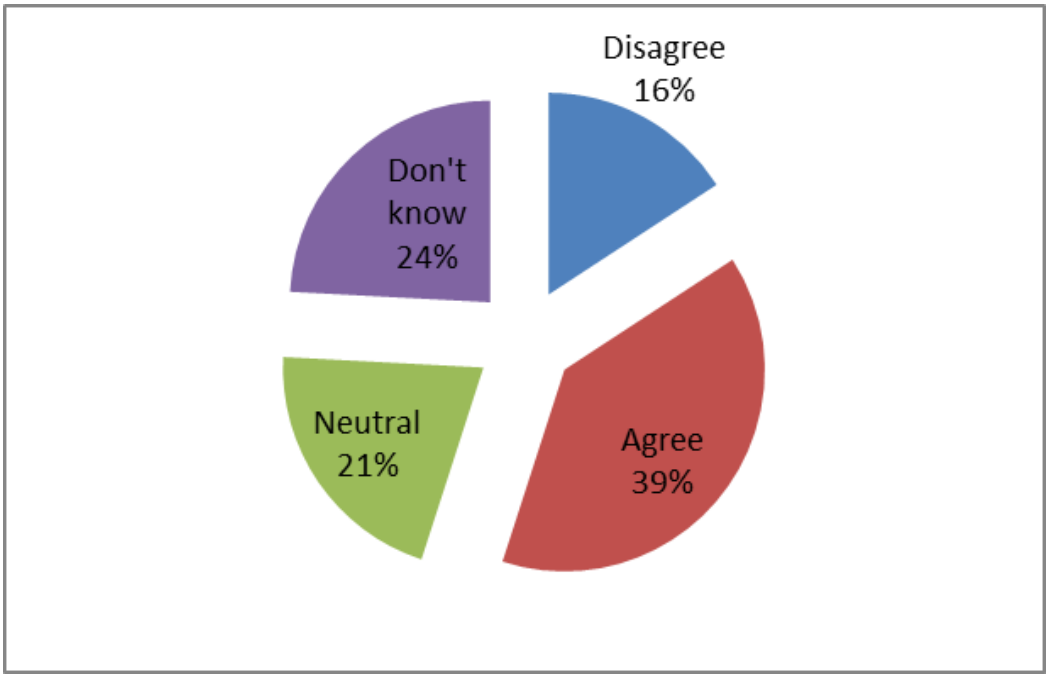

Fig 5: Respondents opinion on the statements "The presence of raptors in the farmland decreases the land value"

"We have another important things to do than to conserve raptors on my farm" was included in the questionnaire and the respondents were asked to tick either any one of these four answer- " disagree", " Agree", "Neutral" and " Don't know". "Disagree" infers that we ought to conserve raptors, "Agree" infers that we do have important business than conserving raptors, "Neutral" refers they don't want to answer this question while "Don't know " infers that they may/may not have important things rather than conserve raptors. We got the followings results as shown in pie charts (Fig 6).

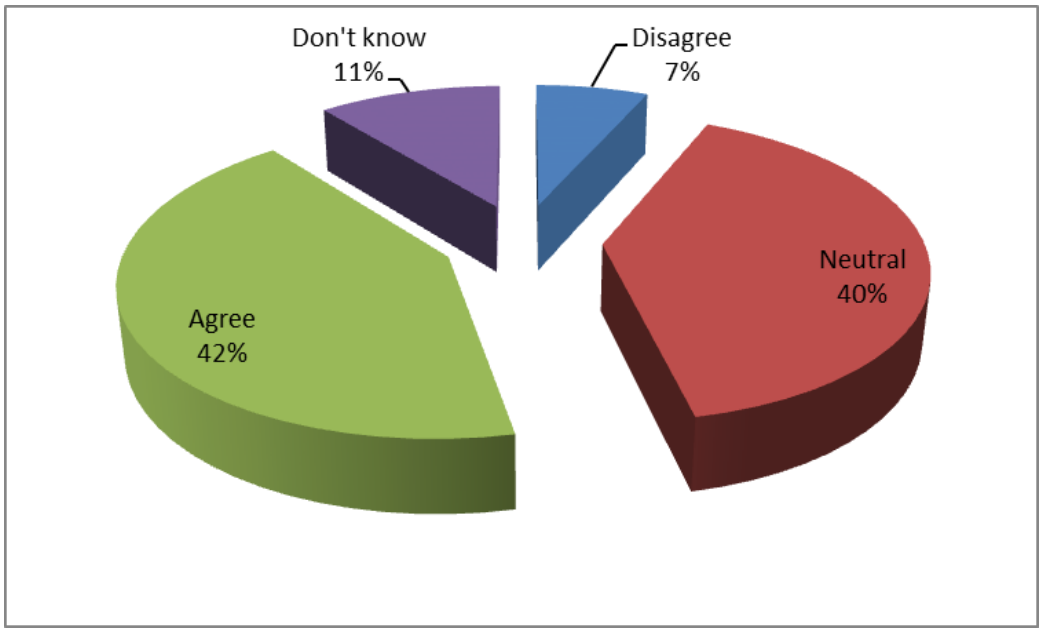

Fig 6: Percentage of the respondents on a question that was asked

Another question regarding on the people perception on where raptors can nest was asked. Three options were given as "raptors have their own right to nest anywhere", "should nest only in the protected area" and "don't know the answer". Majority of people (67) responded that they should nest only in protected area in contrast 38 respondents told that they have a rights to live anywhere as human do have while 14 respondents partially agree both the above mentioned opinion of respondents.

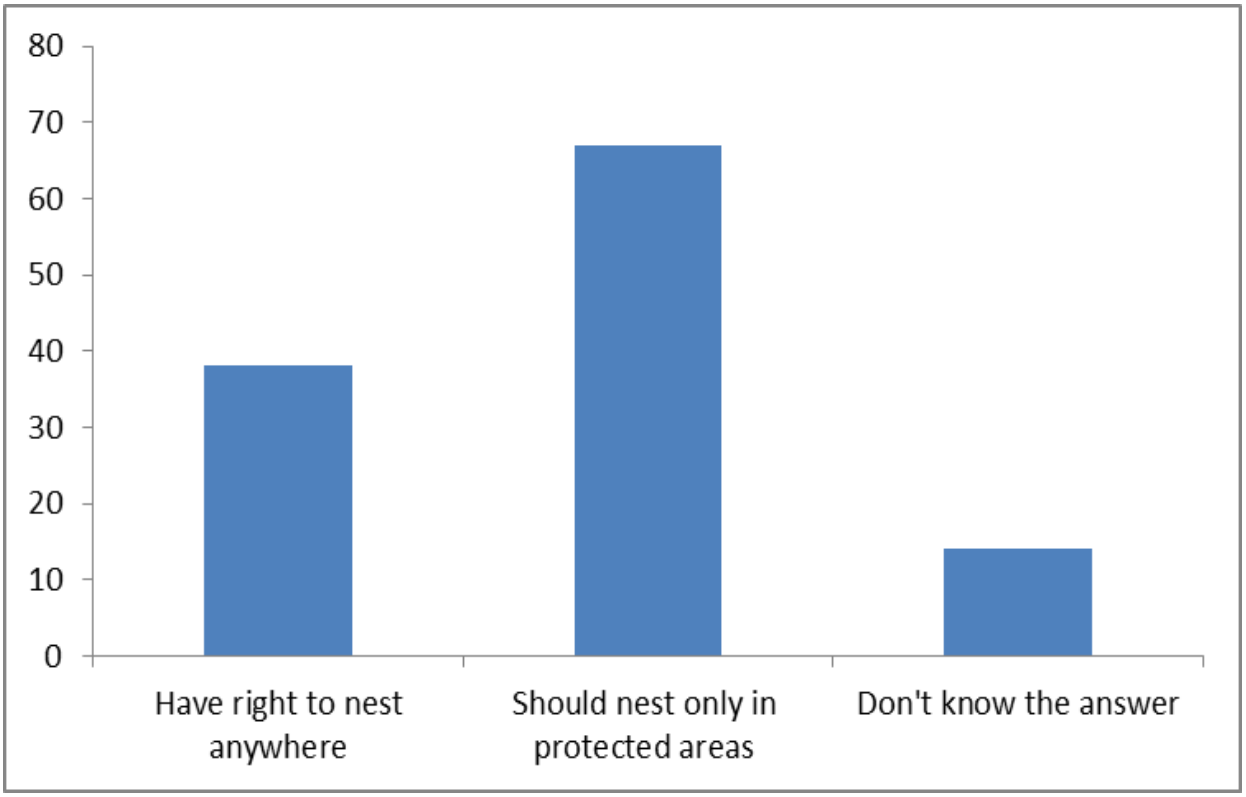

Fig 7: People perception on the place where raptors should build nest

Data regarding on the types of crops grown in the farm, the size of their farmland, crops harvest per year in the farmland, name of the chemical fertilisers, amount of chemical fertilisers used before planting the crops, the name of the chemical pesticides, number of times the chemical pesticides used per year and the amount of chemical pesticides used were collected.

It was found that two types of crops were grown every year. The two main crops were rice and millet. The mostly used chemical fertilisers were found to be urea, DAP, potash and zinc. Out of 120 respondents, 60 used urea twice in a year, 33 thrice a year, 24 four times in a year while one respondent use the dung of cow, buffalo in their farmland and didn' use chemical fertilizers. The land size were converted from Katha to hectare (30 Katha= 1 ha). The mean utilization of the urea was found to be 7.73 kg per Katha, 5.15 kg per Katha for DAP and 4.45 kg per Katha for potash in every year. The amount of the chemical fertilizers doesn't seem worrisome and has been found to be using on reasonable amount.

The average numbers of times the pesticides used in the farm was found to be 3.91 times for each crop including pre- and post-harvesting time, higher compared to the number of times the Nepal Government has proposed. The study showed that of the different pesticide formulation types used by farmers in the area most were insecticides (80.12%) with the remaining 19.88% being rodenticides. The average amount of pesticides used in the study area was found to be 500 gm/ha higher than the result proposed by PPD (2014). The pesticides were found highly utilised during pre- and post-harvesting the crops. The most preferred insecticides by the farmers were found to be carbine while Ratile (zinc phosphite) for rodenticides. It was found that 89.12% of farmers didn't have proper knowledge on use of the pesticides. Pesticides Association of Nepal (PAN) has ranked the carbine at a red level which infers that it is one of the most dangerous pesticides that has a direct impact on the users, plants and the fauna in the farmland. The residual stays at larger amount and longer period of time even after 10-15 days of application of such pesticides in the field. Intoxicated plants when eaten by the prey of eagles intoxicate them and indirect intoxication on eagle and its eaglet might happen when the prey gets eaten by the predator. Deterioration of health could happen and can lead ultimately to the death of the eaglet and eagle when eaten such intoxicated prey items time again and again. On the other hand, zinc phosphate has been kept under the green label. Such rodenticides don't have fatal impact as that of carbine and the residuals don't store for longer period of time in plants as well as in intoxicated rodents. Thus it doesn't have a quick impact on the eagles however the smaller amount of residual get stored in the body and collection in the body might result on the long term condition.

Photo 5 - Dheeraj Chaudhary conducting questionnaire survey with local people of Koshi

Photo 6 - Research assistant collecting information through questionnaire method at Dhanusa from Key-informant

Photo 7 - Research assistant collecting pesticides information from local farmers at Dhanusa

Photo 8 - Questionnaire survey with local farmer in Lumbini

Left: Photo 9 - Scanning the areas to find the fledged juvenile Indian Spotted Eagle in the nesting area of Koshi by Dheeraj Chaudhary and Sandesh Gurung. ©Hari Basnet. Right: Photo 10 - Female Indian Spotted Eagle about to feed the prey item (Frog) to the eaglet.