Pit Lakes and Socio-Economic Status: An Explorative Study in Raniganj Coal Field Area of West Bengal, India

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Abstract

The study explores the potential beneficial effect of pit lake waters on the residents of its adjacent areas on Raniganj Coal Field (RCF) area of West Bengal state of India. Besides irrigation, pit lake waters are used for a wide range of purposes. Pit lake waters are used for bathing, cooking, washing clothes and also for diversified farming. In addition to these, pit lakes are considered to be significantly beneficial for the people of the adjacent areas, since these lakes provide them with different livelihood options. In spite of the several beneficial impacts on the society, the pit lake water and the adjacent areas of these lakes are frequently polluted and contaminated by the activities of the residents of the adjacent villages. In this paper, we endeavor to accentuate the significant benefits of the pit lakes and have also tried to find out how these water resources can be properly maintained, protected and preserved for the advancement of the socio-economic status of the adjacent areas.

Keywords: : Pit lake water, Water resource, Contamination, Preservation, Raniganj Coal Field Area, West Bengal.

Introduction

Although Pit lakes are considered as vast water resource, they are prone to contamination and pollution. If properly utilized, people living in the adjacent areas of these lakes can significantly benefit from this huge source of water. Individuals can use water of pit lakes for domestic purposes, such as for cooking, washing cloths and so on. They can also collect fish from the water of these lakes, which can be used as nutritious and palatable foods, or those collected fish can also be sold in the markets, which will provide them a means of livelihood. Instead of deep tube well irrigation, pit lake water can be easily distributed to the cultivated lands in the adjacent areas at low cost. This leads to an increase in agricultural productivity at a low cost. This convenient source of water enables the farmers of the adjacent farms to start diversified farming, it also enables them to cultivate throughout the year, since even in summer, these lakes contain sufficient water due to their deepness. It is also frequently observed that in the neighboring areas of the pit lakes natural forests are developed. Residents of the adjacent villages can use the woods of these forests as fuel for cooking, or they can earn money by selling these fuel-wood to the distant areas. Moreover, the people of the neighboring areas can earn and elevate their household incomes

by providing different services to the tourists, who frequently come to enjoy the scenic beauty of the pit lake areas.

In spite of the several beneficial impacts on the society, the pit lake water and the adjacent areas of these lakes are frequently polluted and contaminated by the activities of the residents of the adjacent villages. Our principle objective in this paper is to ascertain the benefits of the pit lakes as received by the local residents across diverse socio-economic backgrounds. In addition to this, we also endeavor to observe and study the activities of the local residents across different age and gender groups, which can pollute and contaminate the pit water and pit lake areas.

We have conducted a primary survey to collect data on the benefits and services provided by the pit lakes to the local residents and the activities of the local residents. The paper has been divided into the following sections: Primary data collection methodology, Usage of Pit lake waters for day-to-day purposes, Pit lakes as a means of sustaining livelihoods, Household economic status and dependence on pit water for daily needs, Socio-economic status and the usage of pit lake waters, Attitude of the local residents towards pit lakes water usage, Education as a catalyst for attitudinal change among the local residents, and Views of people regarding the differential usage of pit lake areas**.** The data collection methodology has been explained in brief in the following section. The third section analyses how the pit lakes fulfill the daily needs of the local residents by providing various good and services. Fourth section evaluates the contribution of the pit lakes to the local residents by means of helping them in sustaining their livelihoods. In the fifth and sixth sections, we again discuss the benefits of the pit lakes as reaped by the local residents in terms of satisfying their daily needs. We get the desired results by classifying the sample of households according to their economic status (measured in terms of owning household assets). The seventh and eighth sections of this paper provide an insight into the attitudes of the local residents towards pit lakes. In this section, we have classified the sample individuals by two markers, gender and age. Eighth section evaluates the contribution of education as a means of bringing a change in the attitudes of the individuals towards the pit water and pit lake areas. The ninth section reports the responses of the surveyed individuals to three questions regarding the improvement of the areas of the pit lakes and pit water. And finally the Conclusion sums up the basic arguments of the paper.

Primary data collection methodology

The primary data was collected from the neighboring two-hundred villages of the pit lakes, situated in Raniganj (RCF), as reported in Census India, 2011. We have selected the villages first, then the households and the members of the households were classified. So, the first stage units are villages and second stage or final stage units are the households and individuals. Therefore, we have used a multi-stage stratified random sampling method in this socio-economic survey.

After selecting the villages from the Census India, 2011 adjacent of the pit lakes in RCF, we have stratified the villages into four to six strata according to the

population size. We have applied the probability proportional to size sample, to select the two from four/six strata, then from each selected strata of a village we have selected two households by simple random sampling without replacement method (SRSWOR). So, on the whole, eight-hundred household and 3192 individuals were selected as respondents, and they have been interviewed based upon the well framed questionnaire. To obtain correct and reliable information, efforts were made to explain the questions and their purpose to the sample respondents.

Usage of Pit Lake waters for day-to-day purposes

It has already been mentioned earlier that pit lakes provide goods and services to the local households which prove to be significantly beneficial in satisfying their daily needs. The data of the allied filed reported in Table 1, according to our survey in the adjacent villages of the pit lakes of the RCF, 88 per cent of the surveyed households are using water of the pit lakes for domestic purposes. 79 per cent of the households are consuming fish of the pit lakes; 55 per cent the households are using woods of the forests nearest to the pit lakes as fuel; 52 per cent of the surveyed households are bathing in the pit lake water; and 41 per cent of the surveyed households take wild fruits collected from the forests near pit lakes. Therefore, it can be asserted that pit lake water and resources have immense value for the households living in the adjacent areas of the pit lakes.

Table 1. Percentage of local households using pit lakes for daily needs

Different types of beneficiaries	Percentage of households
1. Households using the water of pit lakes for domestic use	88
2. Households taking the fishes of pit lakes as food	79
3. Households using woods of forest nearest of the pit lakes as fuel in their households	55
4. Households bathing in the pit lake water	52
5. Households taking wild-fruits collected from the forests near the pit lakes	41

Source: Primary survey done by the investigators.

Note: Total number of households is the number of households in the nearby 200 villages of forty pit lakes as described in Census India, 2011.

Pit lakes as a means of sustaining livelihoods

Not only the goods and services provided by the pit lakes are used by the local households for satisfying their own needs and demands, but they also earn from the goods and services provided by these pit lakes. Table 2 provides us an overview of this benefit of the pit lakes. It is observed that 71 per cent of the surveyed households are using pit water for the purpose of irrigation in their cultivated lands; 54 per cent of the households depend on fish farming; 32 per

cent of the households earn from selling the fuel woods collected from the forests near the pit lakes to sustain their livelihoods; 80 per cent of the households living in the neighboring areas of the pit lakes use the grasses that grow on the adjacent lands of the pit lakes, as fodder for their cattle's; 19 per cent of the household earned from the wild foods collected from the forests near the pit lakes; and 27 percent households earned from the visitor and tourists of the pit lakes by providing different services. Thus pit lakes and their resources enable the local residents in sustaining their livelihoods by earning through the sale of the goods and services provided by the pit lakes in the market.

Table 2. Percentage of Local Households using Pit Lakes for Sustaining their Livelihood

Different types of beneficiaries	Percentage of households
1. Households using pit water for irrigating their cultivated lands	71
2. Households depend on fish farming	54
3. Households earn from selling the fuel woods collected from the forest nearby of the pit lakes	32
4. Households using the grasses nearby the pit lakes using as the fodder for cattle	80
5. Households using pit water for their diversified farming	38
6. Households earn from collecting wild fruits from the forests nearby of the pit lakes	19
7. Households earn from the visitors of the pit lakes by providing different services	27

Source: Primary survey done by the investigators.

Note: Total number of households is the number of households in the nearby 200 villages of forty pit lakes as described in Census India, 2011.

Household economic status and dependence on pit water for daily needs

In this section we have briefly discussed the socio-economic status of the local households and their different usage of the Pit water lakes, which significantly varies according to their financial status. Figures 1, 2, 3, 4 and 5 are derived from the data reported in Table 3. It is found that domestic use of pit water declines with the improvement in the economic status of the households. For example, around 88 per cent of the households owning bicycles, are using pit water for domestic use, whereas only 10 per cent of the personal-car-households are using pit water for domestic purposes. This indicates that with an improvement in the economic status, and with a growing awareness of the polluted and contaminated water of the pit lakes among them, they avoid using the water for domestic use. In case of taking the fishes of pit lakes as foods household economic status plays a vital role, since 72 per cent of the households having bicycle are taking fishes of pit lakes as food and the figure declines while the household own bike,

tractor, and /or car. Household economic status has also important bearing on the household use of fuel woods from pit forests. In addition, it can also be stated on the basis of the figures reported on the Table 3 that rising economic status brings down the use of pit-water for bathing and taking wild fruits as foods.

Table 3. Households' economic status and dependence on pit water for their daily needs

	Having bicycle		Having bike		Having tractor		Having personal car	
	Yes	No	Yes	No	Yes	No	Yes	No
1. Households using the water of pit lakes for domestic use	87.77 %	90.11 %	60.31 %	94.12 %	54.34%	96.47 %	9.23 %	99.13 %
2. Households members fishing to take the fishes of pit lakes as food	72%	87.88 %	67.94 %	83.61 %	62.91%	86.11 %	17.19%	91.72 %
3. Households using woods of the forests nearest of the pit lakes as fuel in their households	49%	79%	23.78 %	70.55 %	19.89%	78.16 %	9.41 %	70.44 %
4. Households members bathing in the pit lake water	51.22 %	52.74 %	37.27 %	65.83 %	28.29%	71.86 %	4.59 %	61.89 %
5. Households taking wild-fruits as foods collected from the forests near the pit lakes	38.23 %	65.98 %	20.32 %	70.11 %	11.32%	85.27 %	3.73 %	44.15 %

Source: Primary survey done by the investigators.

Note: (i) Total number of households is the number of households in the nearby 200 villages of forty pit lakes as described in Census India, 2011.

(ii) Sum-total of each cell entry and 100 minus cell entry will always be 100.

Figure 1. Households using the water of pit lakes for domestic use

Figure 2. Households members fishing to take the fishes of pit lakes as food

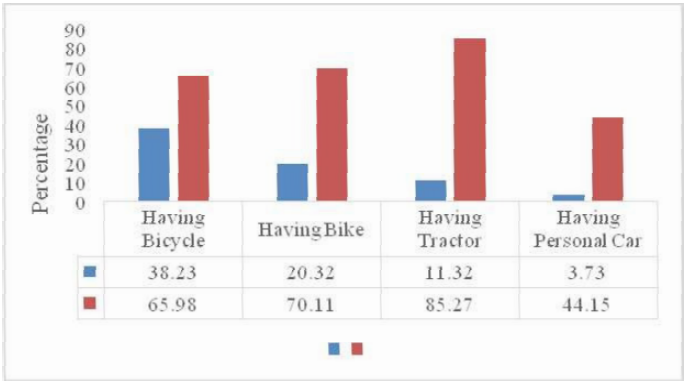

Figure 3. Households using woods of the forests nearest of the pit lakes as fuel in their Households

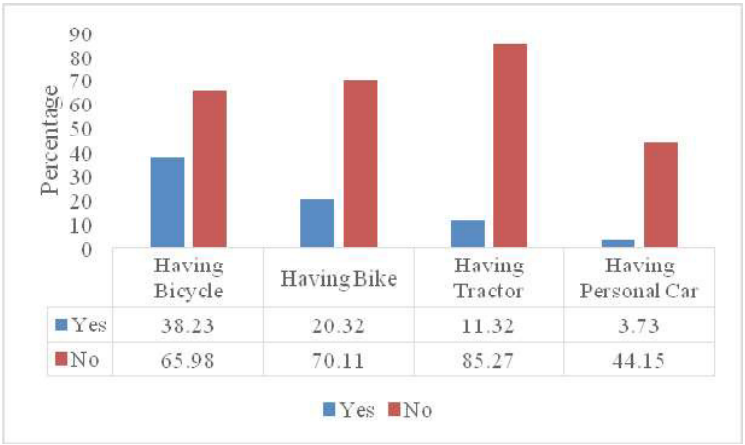

Figure 4. Households members bathing in the pit lake water

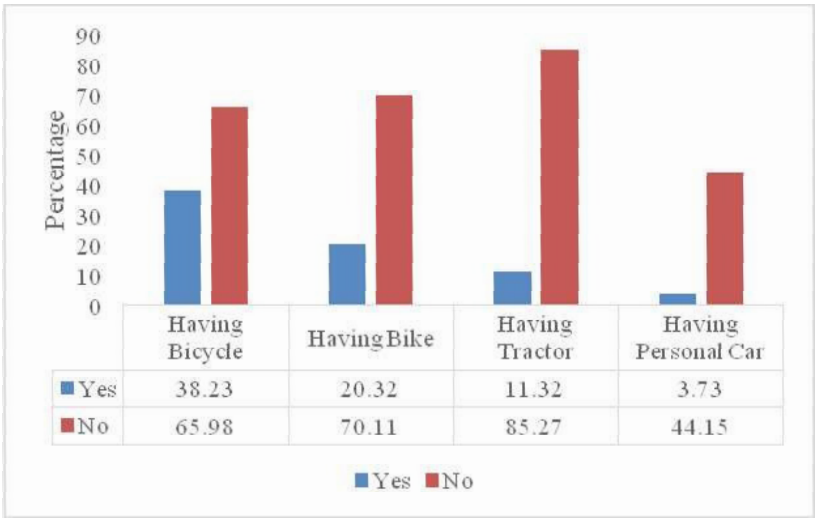

Figure 5. Households taking wild-fruits as foods collected from the forests near the pit lakes

Another way of explaining household economic status is the ownership of livestock of the households. Table 4 reports the dependence of the households on pit water and resources for their daily needs, where the households are classified by the small and big livestock. The small livestock comprises hens, duck etc., big livestock comprises cow, buffalo and so on. Reported values in Table 4 corroborates the findings of Table 3 where household economic status has been defines quite differently. It is observed that relatively poor households, i.e. the households having small livestock are more likely to use pit water for domestic purpose: taking fishes collected from pit lakes as foods; fuel woods collected from pit forests as fuel; using pit water for bathing and taking wild-fruits collected from pit forests as foods, compare to the households having the big livestock. For example, only 50 per cent of the households having big livestock are using pit water for domestic purpose, whereas around 90 per cent of the households having small livestock using pit water for domestic purpose.

Table 4. Ownership of livestock and dependence on pit lakes for daily needs

	Owning small livestock		Owning larger livestock	
	Yes	No	Yes	No
1. Households using the water of pit lakes for domestic use	85.36%	91.87%	49.28%	92.63%
2. Households members fishing to take the fishes of pit lakes as food	70.19%	81.37%	59.77%	90.05%
3. Households using woods of the forests nearest of the pit lakes as fuel in their households	51.44%	78.91%	40.18%	79.56%
4. Households members bathing in the pit lake water	50.02%	54.98%	40.12%	50.87%
5. Households taking wild-fruits as foods collected from the forests near the pit lakes	35.71%	69.88%	9.55%	80.98%

Source: Primary survey done by the investigators.

Note: (i) Total number of households is the number of households in the nearby 200 villages of forty pit lakes as described in Census India, 2011.

(ii) Sum-total of each cell entry and 100 minus cell entry will always be 100.

(iii) Small livestock group comprises hen and duck, and big livestock comprises cow and buffalo.

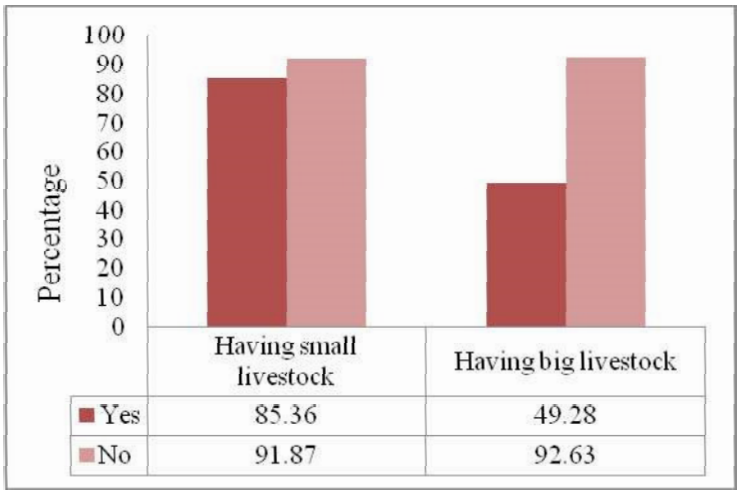

Figure 6. Households using the water of pit lakes for domestic use

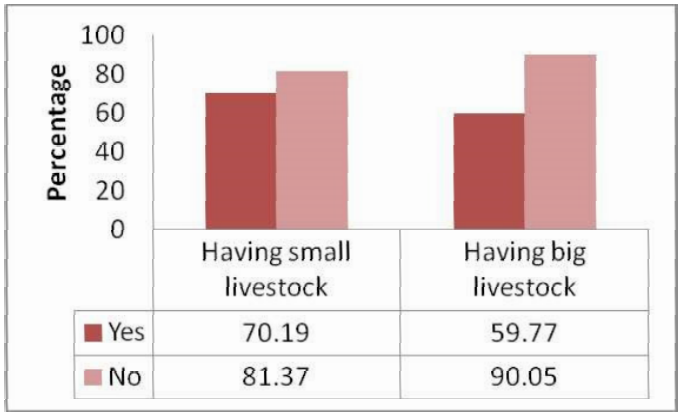

Figure 7. Households members fishing to take the fishes of pit lakes as food

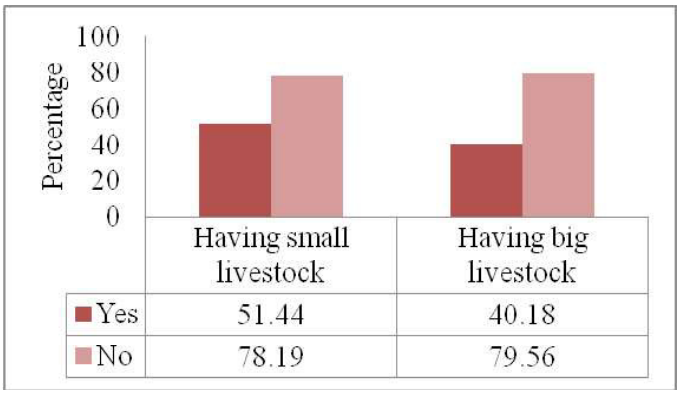

Figure 8. Households using woods of the forests nearest of the pit lakes as fuel in their Households

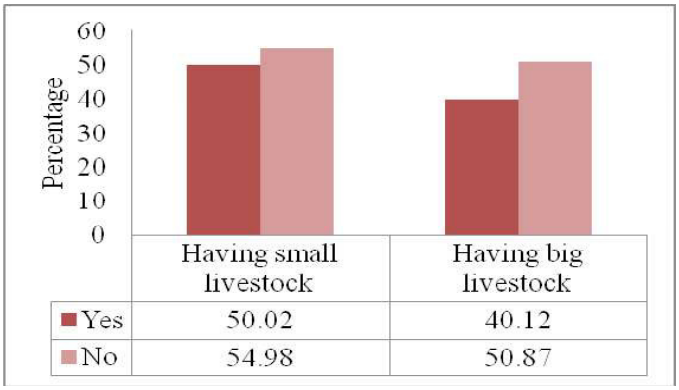

Figure 9. Households members bathing in the pit lake water

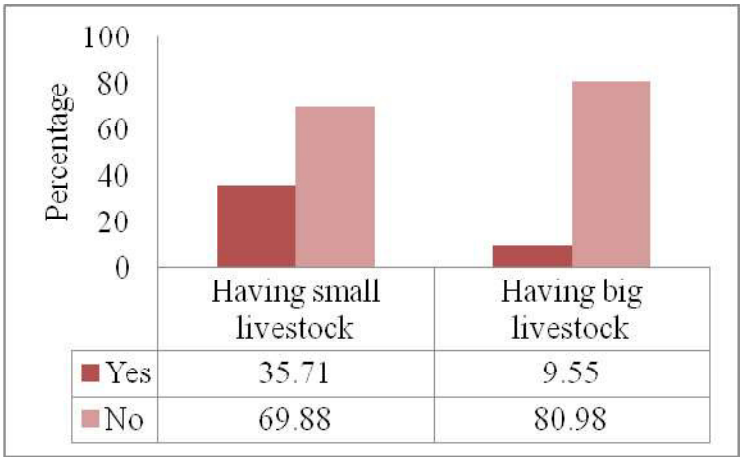

Figure 10. Households taking wild-fruits as foods collected from the forests near the pit lakes

Socio-economic status and the usage of pit lake waters

Similar to section four, in this section too, we have briefly discussed the potential beneficial effect of the pit lakes on the lives of the households residing in the adjacent areas of these lakes in the RCF areas. However, here we have taken into consideration the responses of the individuals belonging to different economic strata, selected on the basis of ownership of assets, such as vehicles and livestock.

It is observed from Tables 5 and 6, and Figures 11-23, that pit lake water usage varies widely depending on the socio-economic status of the people. Here, we have classified the samples based on the ownership of vehicles and livestock. The vehicles have been classified into four categories: bicycle, motor bike, tractor and car, and the livestock are classified into two groups, small livestock comprising duck and hen, and big livestock, including buffalo and cow. The households owning only bicycles are considered relatively poor, while households owning cars are considered rich. Households possessing not even a bicycle, are considered to be the poorest. Likewise, households are considered poor and rich based on the livestock owned by them.

From the data mentioned in Table 6, we can come to the conclusion that pit lake water usage is higher among those households, which possess not even a bicycle, and which earn primarily from the tourists and visitors. The pit-water dependence rate of these households are significantly higher in comparison to others. Thus, Pit-water dependence and economic status have a negative correlation, since the dependence of the households on pit water and pit lakes rises with a decline in the economic status of the households, which is measured in terms of owning motor bike, tractor and car.

The reported figures in Table 6 also corroborate the same fact, vice versa, that dependence rate of the households on pit lakes significantly declines, when the economic status of that particular household improves.

Table 5. Ownership of vehicles and dependence on pit lakes for livelihood

	Having bicycle		Having bike		Having tractor		Having personal car	
	Yes	No	Yes	No	Yes	No	Yes	No
1. Households using pit water for irrigating their cultivated lands	65.78 %	73.21 %	62.18 %	74.22 %	66.34 %	78.27 %	17.86 %	74.11 %
2. Households depend on fish farming	46.18 %	58.29 %	17.56 %	58.99 %	11.05 %	63.23 %	1.27 %	60.26 %
3. Households earn from selling the fuel woods collected from the forest nearby of the pit lakes	31.98 %	32.66 %	24.31 %	40.27 %	14.79 %	50.11 %	3.02 %	37.33 %
4. Households using the grasses nearby the pit lakes using as the fodder for cattle	78.62 %	81.21 %	76.05 %	85.49 %	58.13 %	90.32 %	43.66 %	87.15 %
5. Households using pit water for their diversified farming	37.78 %	40.13 %	23.99 %	44.65 %	19.87 %	49.55 %	11.09 %	54.77 %
6. Households earn from collecting wild fruits from the forests nearby of the pit lakes	13.48 %	21.72 %	7.35 %	20.46 %	3.22 %	24.69 %	0.87 %	19.88 %
7. Households earn from the visitors of the pit lakes by providing different services	8.92 %	27.77 %	4.55 %	18.18 %	3.41 %	19.14 %	0.31 %	20.36 %

Source: Primary survey done by the investigators.

Note: (i) Total number of households is the number of households in the nearby 200 villages of forty pit lakes as described in Census India, 2011.

(ii) Sum-total of each cell entry and 100 minus cell entry will always be 100.

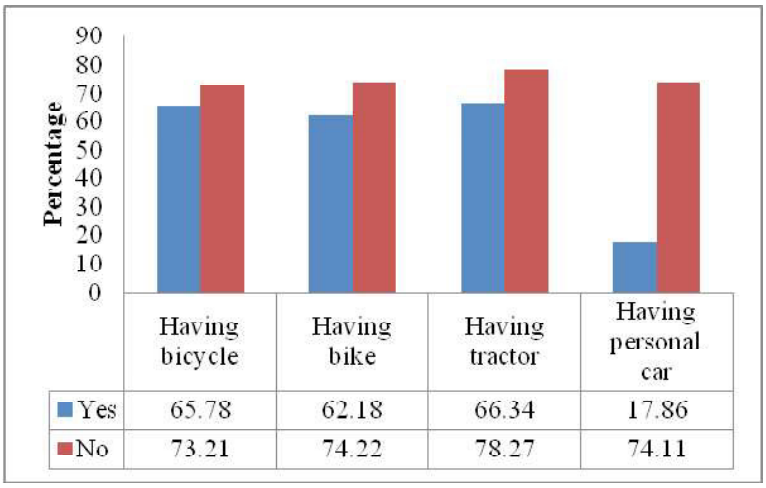

Figure 11. Households using pit water for irrigating their cultivated lands

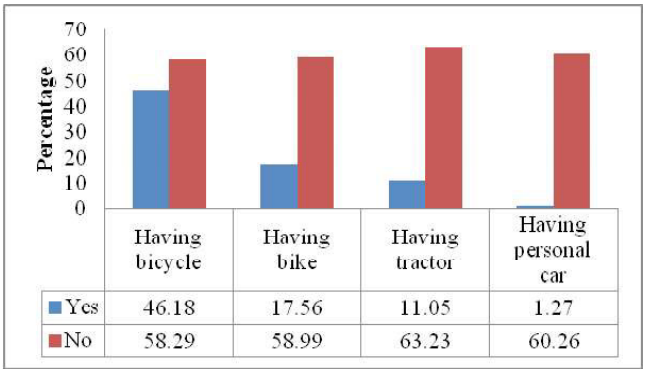

Figure 12. Households depend on fish farming

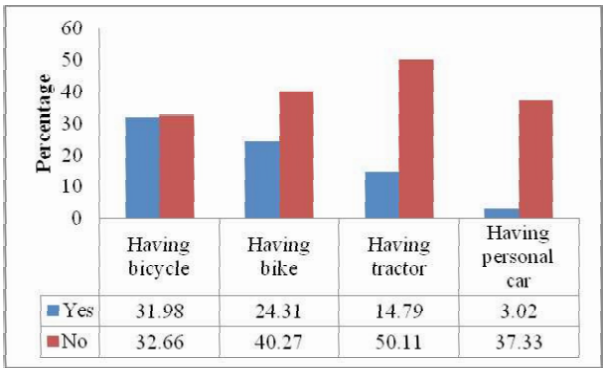

Figure 13. Households earn from selling the fuel woods collected from the forest nearby of the pit lakes

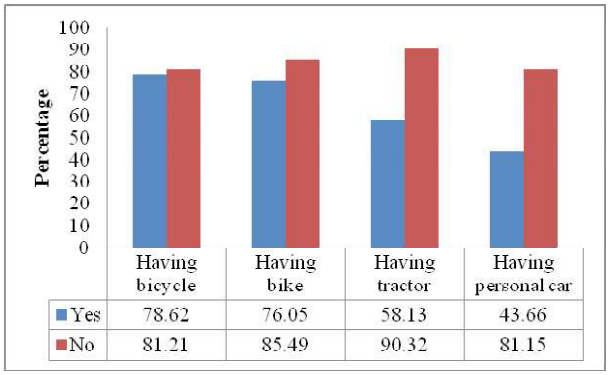

Figure 14. Households using the grasses nearby the pit lakes using as the fodder for cattle

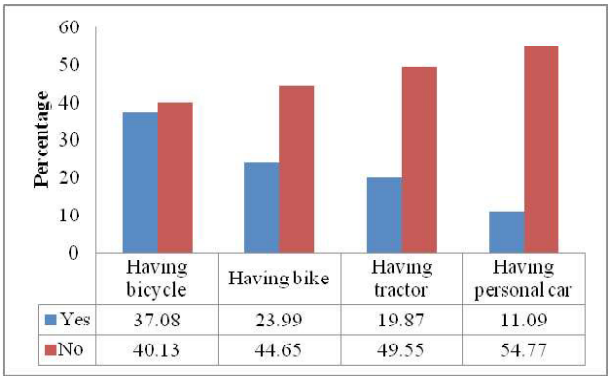

Figure 15. Households using pit water for their diversified farming

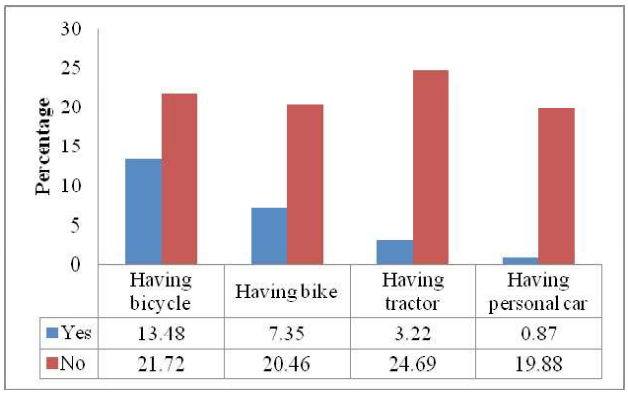

Figure 16. Households earn from collecting wild fruits from the forests nearby of the pit lakes

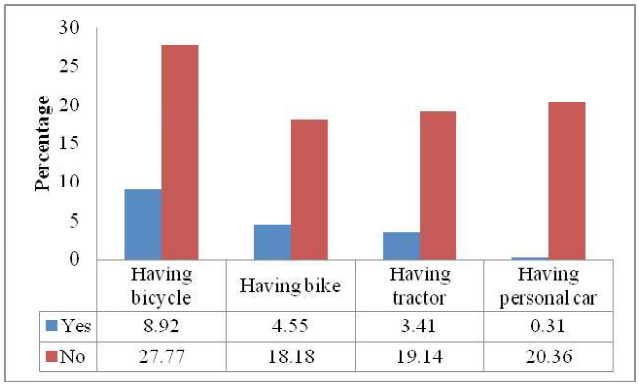

Figure 17. Households earn from the visitors of the pit lakes by providing different services

Table 6. Household ownership of vehicles and dependence on pit lakes for livelihood

	Owning small livestock		Owning larger livestock	
	Yes	No	Yes	No
1. Households using pit water for irrigating their cultivated lands	60.99%	83.52%	61.48%	80.61%
2. Households depend on fish farming	44.06%	60.18%	10.72%	72.49%
3. Households earn from selling the fuel woods collected from the forest nearby of the pit lakes	33.33%	38.82%	12.38%	52.72%
4. Households using the grasses nearby the pit lakes using as the fodder for cattle	-	-	72.13%	-
5. Households using pit water for their diversified farming	40.33%	41.27%	16.68%	50.23%
6. Households earn from collecting wild fruits from the forests nearby of the pit lakes	23.25%	37.11%	8.47%	29.76%
7. Households earn from the visitors of the pit lakes by providing different services	17.82%	34.54%	9.51%	27.46%

Source: Primary survey done by the investigators.

Note: (i) Total number of households is the number of households in the nearby 200 villages of forty pit lakes as described in Census India, 2011.

(ii) Sum-total of each cell entry and 100 minus cell entry will always be 100.

(iii) Small livestock group comprises hen and duck, and big livestock comprises cow and buffalo.

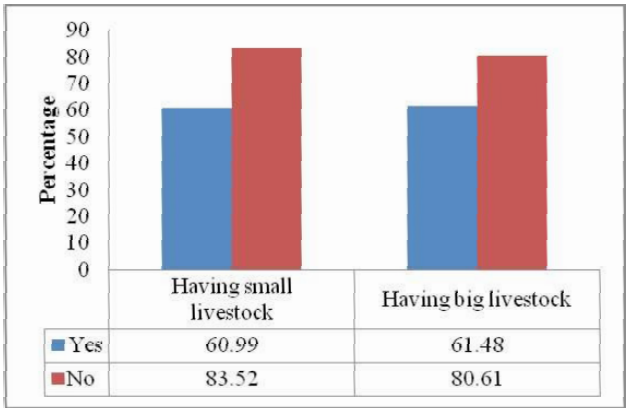

Figure 18. Households using pit water for irrigating their cultivated lands

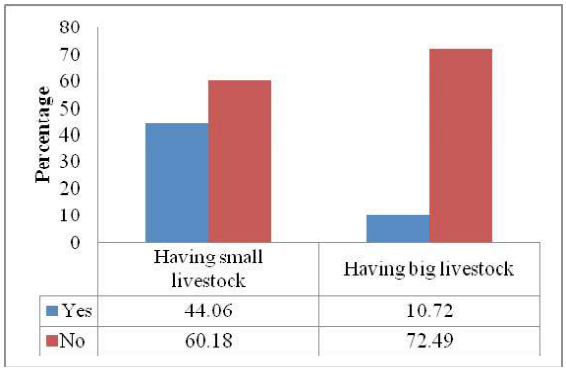

Figure 19. Households depend on fish farming

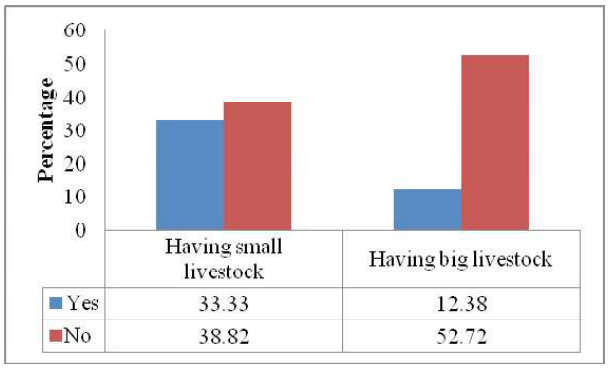

Figure 20. Households earn from selling the fuel woods collected from the forest nearby of the pit lakes

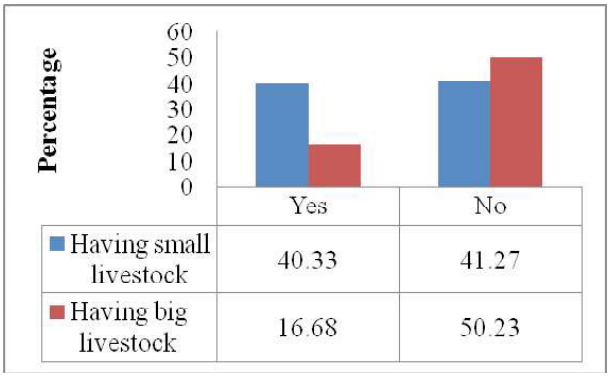

Figure 21. Households using pit water for diversified farming

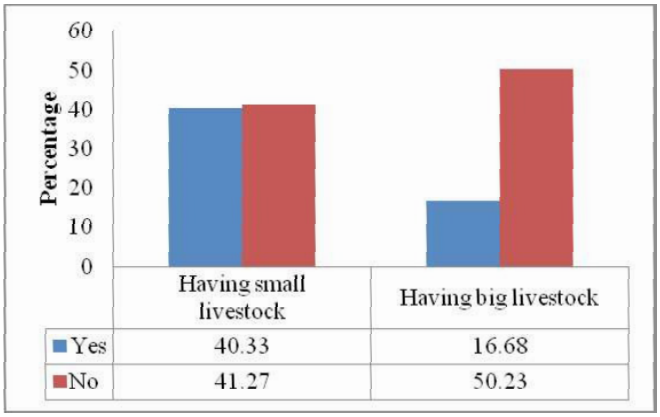

Figure 22. Households earn from collecting wild fruits from the forests nearby of the pit lakes

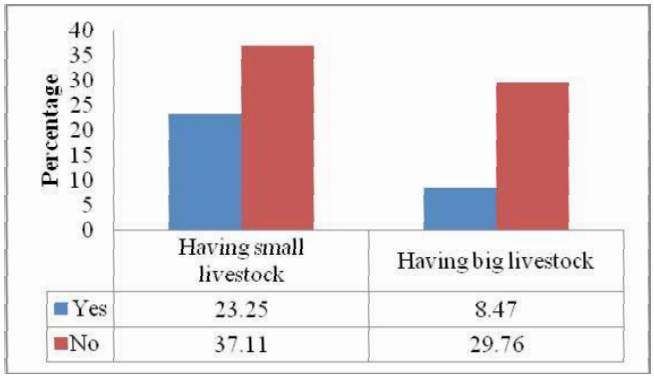

Figure 23. Households earn from the visitors of the pit lakes by providing different services

Attitude of the local residents towards the pit lakes

Based upon the earlier analysis it can be perceived that the pit lakes in the RCF areas have significant beneficial impacts on the lives of the residents of the neighboring villages of these lakes. Now, the question arises that – what is the attitude of these individuals towards these lakes, i.e., their environmental awareness, their views regarding the conservation, preservation and protection of these pit lake areas. To get the answer, we have classified the sample by two markers – gender and age. Gender-wise classification generates two groups, males and females, and age wise classification creates three groups - age group one, two and three. Age group one comprises the individuals aged between 15 to 30 years; age group two incorporates the individuals belonging to the age-group 36 to 60, and age group three includes individuals aged 61 and above.

Table 7. Attitudes of the local residents towards the pit lakes may varied by sex

Different types of use	Percentage of individuals
1. Use the pit lake areas as dustbin:	
(a) Males	79.22
(b) Females	72.66
2. Use the pit lake areas as lavatory:	
(a) Males	91.03
(b) Females	84.28
3. Use the pit lakes for idol immersion:	
(a) Males	94.91
(b) Females	4.77
4. Sustainable use of the pit lakes:	
(a) Males	78.49
(b) Females	77.12

Source: Primary survey done by the investigators.

Note: (i) Sustainable use of the pit lakes means that the individuals residing in the adjacent areas of the pit lakes do not do any work which can pollute the water of the pit lakes

It has been observed, that three activities of the local residents can severely pollute the pit water and pit lake areas, and can also distort the scenic view of these areas. These activities include - the use of the pit lake areas as dustbin, as lavatory and for idol immersion. Table 7 reports the percentages of males and females, who use the pit lake areas as dustbin, as lavatory and for idol immersion. It is observed that the contribution of female respondents towards polluting the pit water and pit lake areas is much less than that of the male respondents. However, when the males and females were questioned regarding the sustainable use of the pit water and pit lake areas, the percentage response of males was higher than the females. Figures 23, 24, 25 and 26 depict the story reported in Table 7.

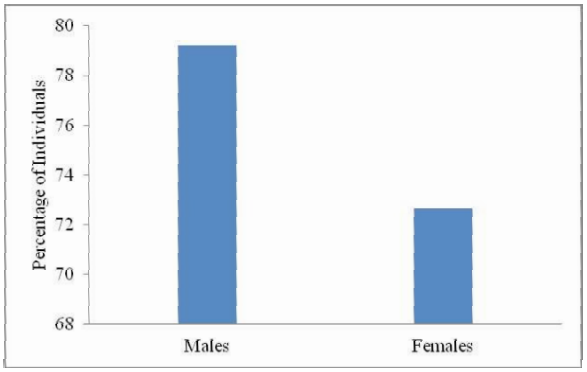

Figure 23. Percentages of males and females using the pit lake areas as dustbin

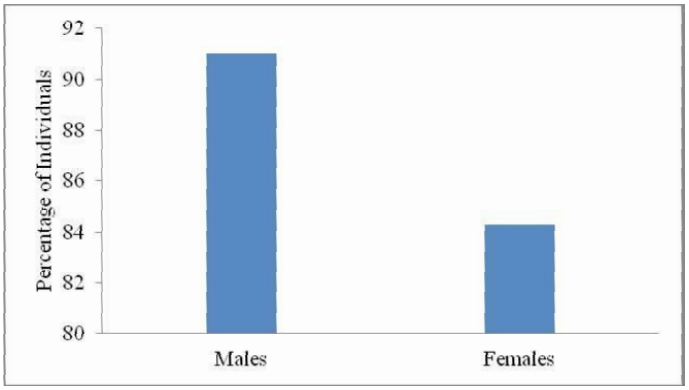

Figure 24. Percentages of males and females using the pit lake areas as lavatory

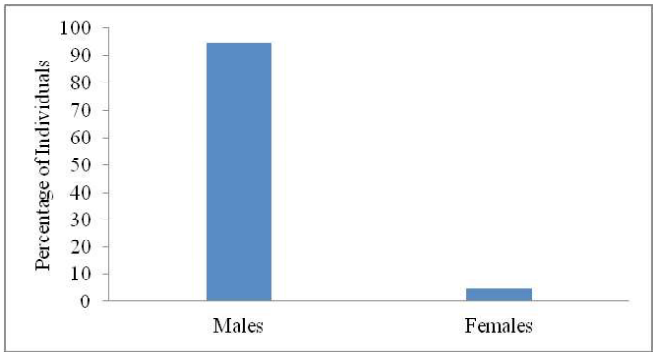

Figure 25. Percentages of males and females using the pit lakes for idol immersion

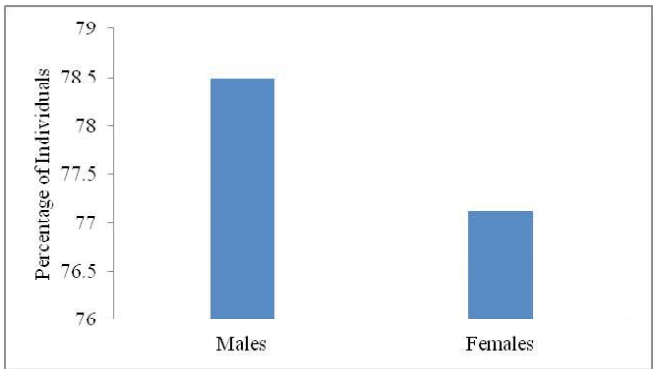

Figure 26. Percentages of males and females using the pit lakes sustainably

If we look at the reported figures in Table 8, and the Figure 27, it can be found that with age people become more aware regarding environment and their own activities that cause harm to it. It has been found that around 80 percent of the individuals belonging to the youngest age group, use the pit water and pit lake areas as dustbin, the percentages for age group two and three are 50 per cent and 55 percent respectively. When the question was regarding the use of the pit lake areas as lavatory, then the responses of the age groups reversed, since around 20 percent of the individuals from the youngest age group, 24 percent of the respondents from medium age group and 45 percent of the respondents of the oldest age group assured that they usually use the adjacent areas of the pit lakes as lavatory. Likewise, in the third situation, i.e., in the case of idol immersion denial of the respondents from the

Table 8. Attitudes of the local residents towards the pit lakes may varied by age

Different types of use	Percentage of individuals
1. Use the pit lake areas as dustbin:	
(a) Age group one	78.42
(b) Age group two	48.35
(c) Age group three	53.34
2. Use the pit lake areas as lavatory:	
(a) Age group one	19.64
(b) Age group two	23.77
(c) Age group three	45.13
3. Use the pit lakes for idol immersion:	
(a) Age group one	27.88.
(b) Age group two	54.29
(c) Age group three	60.52
4. Sustainable use of the pit lakes:	
(a) Age group one	94.78
(b) Age group two	81.32
(c) Age group three	56.59

Source: Primary survey done by the investigators.

Note: (i) Age group one comprises the individuals aged between 15 years to 30 years; age group two contains the individuals aged between 36 years to 60 years, and age group three includes the individuals aged from 61 years and above.

(ii) Sustainable use of the pit lakes means that the individuals residing in the adjacent areas of the pit lakes do not do any work which can pollute the water of the pit lakes

Youngest age group is much higher. Similarly, in the context of the sustainability, youngest age group occupies better place than the medium and oldest age groups. Figures 28, 29 and 30 are the pictorial representations of the last three cases are reported in Table 8, which enable us to understand the condition more clearly and quickly.

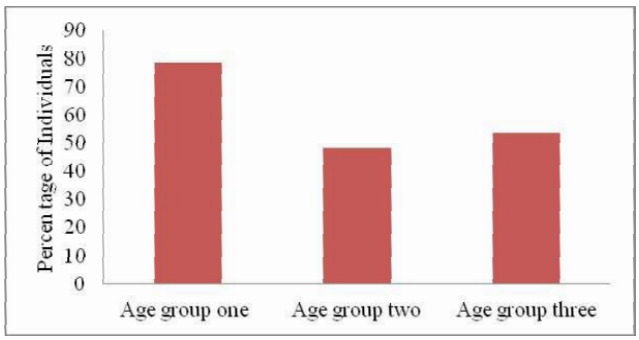

Figure 27. Percentages of individuals across different age groups using the pit lake areas as dustbin

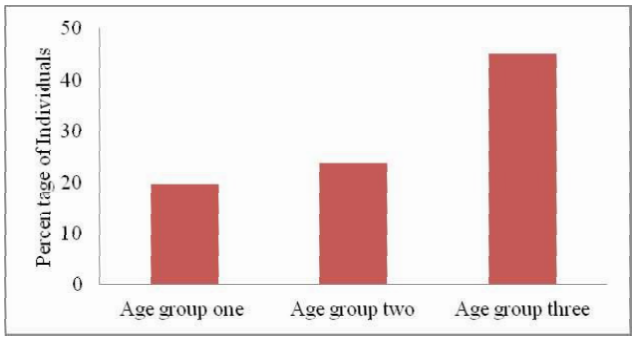

Figure 28. Percentages of individuals across different age groups using the pit lake areas as lavatory

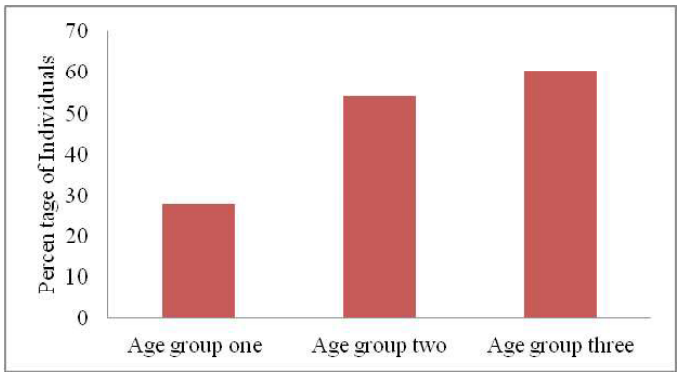

Figure 29. Percentages of individuals across different age groups using the pit lakes for idol immersion

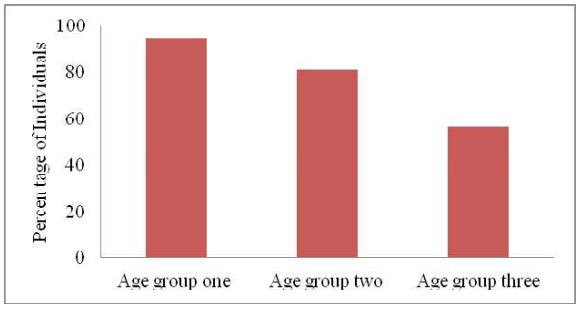

Figure 30. Percentages of individuals across different age groups using the pit lakes Sustainably

Education as a catalyst for attitudinal change among the local residents

It is rather commonplace that education can raise the socio-economic status. More educated persons are more eligible to get work, which raises their incomes, and they are more health conscious than the less educated people. Reported figures in Table 9, and the figures drawn from these reported figures of this table also support this view. We classify the sample of the respondents into three educational classes - illiterate and low educated implies without any formal schooling and formal schooling upto 5 years; medium educated implies formal schooling upto 12 years, and higher educated implies educated more than higher secondary level of education.

Table 9. Educational achievement can change the attitudes towards pit lakes

Different types of use	Percentage of individuals
1. Use the pit lake areas as dustbin:	
(a) Illiterate and low educated	92.79
(b) Medium educated	61.82
(c) Higher educated	20.34
2. Use the pit lake areas as lavatory:	
(a) Illiterate and low educated	78.22
(b) Medium educated	31.49
(c) Higher educated	5.66
3. Use the pit lakes for idol immersion:	
(a) Illiterate and low educated	98.03
(b) Medium educated	88.17
(c) Higher educated	70.33
4. Sustainable use of the pit lakes:	
(a) Illiterate and low educated	34.67
(b) Medium educated	65.99
(c) Higher educated	81.43

Source: Primary survey done by the investigators.
Note: (i) Illiterate and low educated implies without any formal schooling and formal schooling upto 5 years; medium educated implies formal schooling upto 12 years, and higher educated implies educated more than higher secondary level of education.
(ii) Sustainable use of the pit lakes means that the individuals residing in the adjacent areas of the pit lakes do not do any work which can pollute the water of the pit lakes.

It is found that 93 per cent of the illiterate persons, 62 per cent of the moderately educated persons and 20 per cent of the higher educated persons are using pit water and pit lake areas as dustbin. Likewise 78 per cent and 98 per cent of the illiterates, 31 per cent and 88 per cent of the moderately educated persons, and 6 per cent and 70 per cent of the higher educated persons are either using pit water and pit lake areas as lavatory or supporting the activity of idol immersion in the pit water.

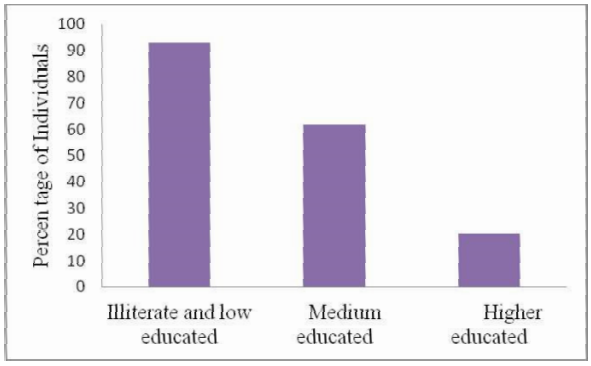

Figure 31. Percentages of individuals with differential educational achievement using the pit lake areas as dustbin

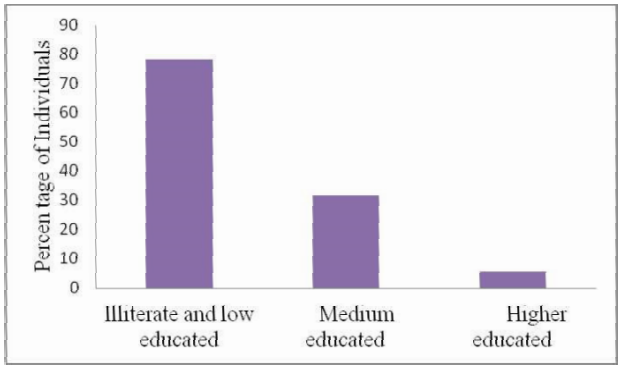

Figure 32. Percentages of individuals with differential educational achievement using the pit lake areas as lavatory

If the sustainable use of the pit water and the areas of the pit lake is concerned, higher educated persons occupies better place compared to the illiterate and moderately educated persons. These results indicate that rise in educational achievement not only improves the socio-economic condition of the individuals, but it also improves their attitudes and knowledge on the contribution of the pit lakes towards the development of the society. This prevents them to pollute the pit water and pit lake areas.

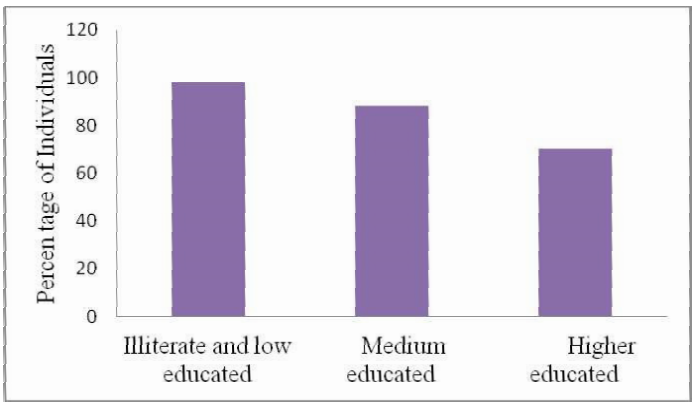

Figure 33. Percentages of individuals with differential educational achievement using the pit lakes for idol immersion

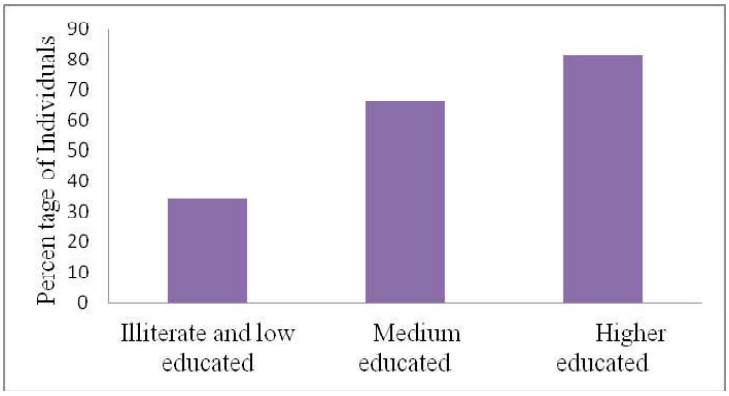

Figure 34. Percentages of individuals with differential educational achievement using the pit lakes sustainably

Views of people regarding the differential usage of pit lake areas

Finally, last three questions of the questionnaire were on the improvement of the pit lake areas. These questions are – (i) Can the extensive use of the pit lake areas for tourism develop the local economy? (ii) Can the extensive use of the pit lake areas as picnic spots develop the local economy? and (iii) Is there any aesthetic value of the pit lakes?

Table 10. Local people arguing for the development of the pit lake areas for entertainment and other uses

	Percentage of respondents			
	Yes	**No**	**No answer**	**Total**
1. Can the extensive use of the pit lakes areas for tourism develop the local economy?	67.34	20.19	10.47	100
2. Can the extensive use of the pit lakes areas for picnic spot develop the local economy?	70.12	18.53	11.35	100
3. Is there any aesthetic value of the pit lakes?	53.79	28.62	17.59	100

Source: Primary survey done by the investigators.

Table 10 reports the responses of the respondents on the improvement of the pit lake areas for different purposes. Pie charts Figures 34, 35 and 36 are drawn from the responses reported in Table 10, each for a separate question.

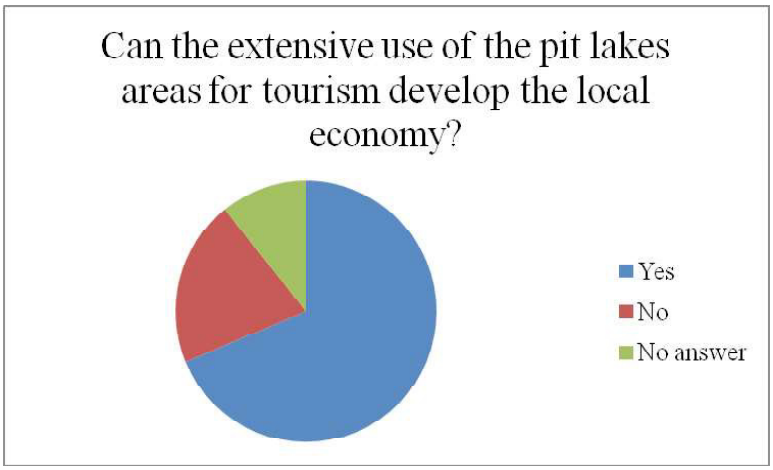

Figure 35. Pie chart drawn on the basis of the responses of the surveys persons on the question – Can the extensive use of the pit lakes areas for tourism develop the local economy?

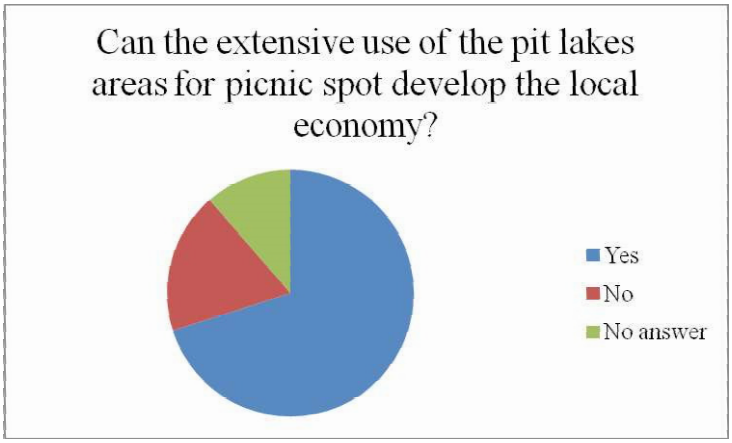

Figure 36. Pie chart drawn on the basis of the responses of the surveys persons on the question - Can the extensive use of the pit lakes areas for picnic spot develop the local economy?

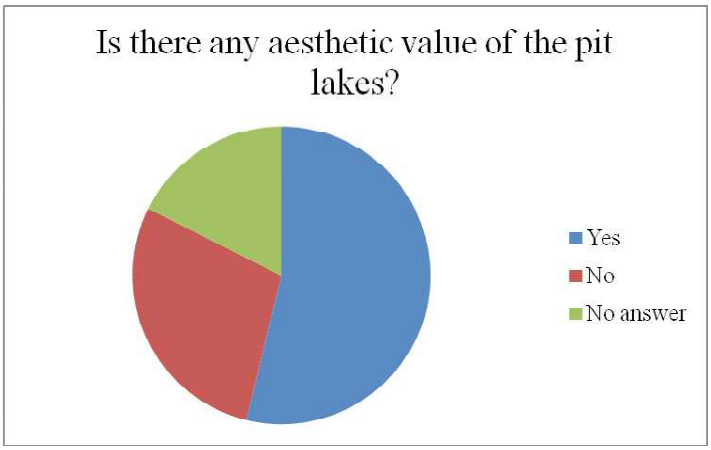

Figure 37. Pie chart drawn on the basis of the responses of the surveys persons on the question – Is there any aesthetic value of the pit lakes?

Conclusion

In this paper, I have discussed the contribution of the pit lakes and their water resources to regional communities, their attitude towards the pit lakes, and their activities which are polluting the pit lake areas of RCF and also the water of the these lakes. I have also tried to show in this paper, that the Pit lake waters can be used for a wide range of purposes and can actually help people in maintaining their livelihoods, if the residents of the adjacent areas change their attitude and properly utilize the lake water without polluting it. With a rise in educational achievement an individual's value judgment can be completely

changed. So, with the rise in income of the households through developing some projects, the educational achievement of the members of the households can be improved, as there is a direct relationship between household income and educational achievement of people. Literacy and environmental awareness can change the attitude of individuals and this can minimize the risks of pollution and contamination of the pit lake area and pit lake water. In addition, this rise in educational attainment can also minimize the health problems, and other problems related with low income and low education.

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