Effects of Socio-Economic and Occupation on Beneficiary and non-Beneficiary Water-shed Management Catchment Areas in the State of Nagaland, India

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A B S T R A C T

The present study to access the socio-economic aspects of beneficiaries and non-beneficiary on watershed management implemented with especial reference to the purpose in selected both districts from the Nagaland state viz; Dimapur and Kohima; as both were selected purposely due to the maximum number of area covered under watershed in the zone further two blocks from each district were randomly selected, which was finally having 8 numbers of watersheds areas were selected. In the second stage of sampling a multi stage random sampling was used for the selection of beneficiary and non-beneficiary viz; 160 respondents (80 beneficiaries and 80 non-beneficiaries) were selected randomly from identified watershed areas. Further the beneficiaries were doing primary, secondary and tertiary occupation on small and medium group, were as large were engaged as primary and secondary occupation only.

Introduction

Nagaland, the 16th State of the Indian Union, came into being on 01st December 1963. Nagaland with a geographical area of about 16,579 Sq. Km. lies between 25°60' and 27°40' North latitude and 93°20' and 95°15' East longitude. The state is bounded by Assam in the North and West, by Myanmar and Arunachal Pradesh in the East and by Manipur in the South. Nagaland, being one of the "Eight Sisters" commonly called as the North-Eastern Region including Sikkim, is a land of lush green forests, rolling Mountains, enchanting valleys, swift flowing streams and of beautiful landscape. The inhabitants of Nagaland are almost entirely tribal with distinctive dialects and cultural features (Annon., 2017).

Agriculture is the backbone of Indian economy and largely dependent on natural

resources like soil, water and vegetation. Indian agriculture is to transform rain-fed farming into more sustainable and productive system to better support the population dependent upon it (Walling *et.al*., 2017). Out of the 142 million ha of cultivated land in India, 105 million ha under tainted agriculture, which contributes 44.00 per cent of total food basket and supporting 40.00 per cent of the production (Annon. 2016).

Watershed management activities is the process of guiding and organizing land, soil and other resource use on a watershed to provide needed goods and services and simultaneously conserving soil, water and land natural resources. The interrelationships among soil land used and water, and the linkages between up-stream and downstream area are given an explicit significance in watershed approach. Water shad management focuses on using resources in a productive and sustainable manner. The Government of Nagaland has launched many watershed projects financed by national and international donor agencies with a view to rehabilitate the degraded environment and improve the economy of the state (Walling and Sharma, 2015).

Watershed is defined as a hydro-geological unit area from which the rainwater drains through a single outlet. Watershed development refers to the conservation, regeneration and judicious use of all the natural resources (like land, water, plants, animals) by human beings (Sharma *et.al*., 2015).

A watershed provides a natural geo-hydrological unit for planning any developmental initiative (Sharma, 2012; Tangjang and Sharma, 2018). The approach would be treatment from "ridge to valley". The present study having the two specific objectives viz; To evaluate the resource use-

efficiency of the sample farmers, and to study the marginal value product of Integrated Watershed Management Programme.

Materials and Methods

For the present study In the first stage two districts were selected purposively viz; Dimapur and Kohima due to the maximum areas and catchment areas, while in the second stage of sampling a multi stage random sampling was used for the selection of beneficiary and non-beneficiary viz; 320 respondents (160 beneficiaries and 160 non-beneficiaries) were selected randomly from identified watershed areas. Study reveals that two blocks from each district will be selected randomly for the present study as these blocks are well covered the watershed programme successfully. Altogether eight villages were selected randomly from each district, while four villages from each block were selected and listed which would be obtained from the offices of SDO (Civil), R. D. block headquarter and other related offices. However, it is proposed to select four villages from each block randomly covered the water shed programme / schemes. After selection of the villages, a list of beneficiaries and non-beneficiaries of KVK will be prepared from each of the selected village. In order to have representative sample from each village a sample of 20 numbers of cases, out of that 10 from beneficiaries and 10 from non-beneficiaries will be drawn following the purposively random sampling method. This will result in selection of 320 respondents from 8 villages, out of which 160 will be beneficiaries of the schemes and 160 will be non-beneficiaries of the watershed schemes for comparisons.

Results and Discussion

Table 1 reveals the total percentage category was found maximum on old age group with

47.81, followed by middle age group with 42.19 per cent and it was recorded least with 10.00 per cent young age group, respectively. Even the chi-square value on both the group viz; beneficiary and non-beneficiary were found to be significant.

Similar studies were find out by the Sharma (2004); Sharma (2004); Sharma (2011); Sangtam and Sharma (2015); Sharma *et al.,* (2016); Shuya and Sharma *et al.,* 2018.

Table 2 reveals that the demography on beneficiaries group the maximum percentage was recorded on medium (60.73), followed by small with 35.29 per cent and it was recorded least with 3.98 on large, while on non-beneficiaries group the maximum percentage was recorded on medium (57.81), followed by small with 35.15 per cent and it was recorded least with 7.03 on large, respectively.

Even the chi-square value on both the group viz; beneficiary and non-beneficiary were found to be significant. Similar studies were find out by the Sharma (2004); Sharma (2004); Sharma (2011); Sangtam and Sharma (2015); Sharma *et al.,* (2016); Shuya and Sharma *et al.,* 2018.

Table 3 reveals the educational status on beneficiaries group the maximum percentage was recorded on medium (60.15), followed by small with 35.78 per cent and it was recorded least with 4.06 on large, while on non-beneficiaries group the maximum percentage was recorded on medium (57.70), followed by small with 35.26 per cent and it was recorded least with 7.03 on large, respectively.

Even the chi-square value on both the group viz; beneficiary and non-beneficiary were found to be significant. Similar studies were find out by the Sharma (2002); Sharma (2004); Sharma and Sharma (2008); Sharma (2011); Sharma (2014); Sangtam and Sharma

(2015); Sharma *et al.,* (2016); Pongener and Sharma (2018), Sharma *et al.,* 2018.

Table 4 reveals that the primary on beneficiaries group the maximum percentage was recorded on medium (55.70), followed by small with 41.61 per cent and it was recorded least with 2.68 on large, while on non-beneficiaries group the maximum percentage was recorded on medium and small both with 44.97 per cent and it was recorded least with 4.14 on large, respectively.

Even the chi-square value on both the group viz; beneficiary and non-beneficiary were found to be significant. Similar studies were find out by the Dhakre and Sharma (2010); Sharma (2011); Shuya and Sharma (2014); Sharma *et al.,* (2016) Sharma *et.al*., (2018). Table 5 reveals that on beneficiaries group the maximum percentage was recorded on medium (53.50), followed by small with 43.95 per cent and it was recorded least with 2.55 on large, while on non-beneficiaries group the maximum percentage was recorded on small with 48.10 per cent, followed by medium with 47.47 per cent and it was recorded least with 4.43 on large, respectively.

Similar studies were find out by the Sharma (2004); Dhakre and Sharma (2010); Sharma *et al.,* (2016); Sharma *et.al*. (2018).

Table 6 reveals the tertiary occupation on beneficiaries group the maximum percentage was recorded on medium (61.11), followed by small with 38.89 per cent and it was recorded as zero (nil) on large, while on non-beneficiaries group the maximum percentage was recorded on medium (61.90), followed by small with 38.10 per cent and on large it was zero (nil), respectively.

Similar studies were find out by the Sharma (2002); Pongener and Sharma (2018), Sharma *et al.,* (2018).

Table.1 Age of beneficiaries and non-beneficiaries of respondent family

S. No.	Age	Beneficiaries	Non-beneficiaries	Total
1.	Young (<35 years)	19	13	32
		(5.94)	(4.06)	(10.00)
2.	Middle (36 to 50 years)	59	76	135
		(18.43)	(23.75)	(42.19)
3.	Old (51 & above)	82	71	153
		(25.63)	(22.2)	(47.81)
Total		160	160	320
		(50.00)	(50.00)	(100.00)
Chi square value		*105.368; p = 0.392**	*81.462; p = 0.618**	-

The figure in the parentheses indicates percentage in total; Asterisk showed non-significant. Data showed significant at p< 0.05)

Table.2 Demography of beneficiaries and non-beneficiaries and association

	Groups	Sample Size	Child	Female	Male	Total	Average
Beneficiaries	Small	72	79	104	136	319	4.43
		(45.00)	(8.74)	(11.50)	(15.04)	(35.29)	
	Medium	84	125	184	240	549	6.53
		(52.50)	(13.82)	(20.35)	(26.55)	(60.73)	
	Large	4	6	11	19	36	9
		(2.50)	(0.66)	(1.22)	(2.10)	(3.98)	
	Total	160	210	299	3905	904	5.65
		(100.00)	(23.23)	(33.07)	(43.70)	(100.00)	
	Chi square value	-	21.533 p = 0.001	69.324 p = 0.00	167.955 p = 0.00	-	-
Non-beneficiaries	Small	76	95	103	117	315	4.15
		(47.50)	(10.60)	(11.49)	(13.06)	(35.15)	
	Medium	77	173	156	189	518	6.73
		(48.12)	(19.30)	(17.41)	(21.09)	(57.81)	
	Large	7	18	18	27	63	9
		(4.38)	(2.00)	(2.00)	(3.01)	(7.03)	
	Total	160	286	277	333	896	5.6
		(100.00)	(31.92)	(30.92)	(37.16)	(100.00)	
	Chi square value	-	34.459 p = 0.001	41.815 p = 0.00	82.835 p = 0.00	-	-

(The figure in the parentheses indicates percentage in total; Data showed significant at p< 0.05)

Table.3 Educational status of beneficiaries and non-beneficiaries

	Groups	Illiterate	Primary school	High school	Graduate & above	Total
Beneficiaries	Small	87	133	92	14	**326**
		(9.55)	(14.60)	(10.10)	(1.54)	**(35.78)**
	Medium	121	197	192	38	**548**
		(13.28)	(21.62)	(21.07)	(4.17)	**(60.15)**
	Large	8	10	14	5	**37**
		(0.88)	(1.09)	(1.54)	(0.55)	**(4.06)**
	Total	**216**	**340**	**298**	**57**	**911**
		(23.71)	**(37.32)**	**(32.71)**	**(6.26)**	**(100.00)**
	Chi square value	16.730 $p = 0.01$	13.191 $p = 0.105*$	75.652 $p = 0.00$	34.531 $p = 0.00$	-
Non-beneficiaries	Small	76	158	76	6	**316**
		(8.48)	(17.63)	(8.48)	(0.67)	**(35.26)**
	Medium	110	270	100	37	**517**
		(12.28)	(30.13)	(11.16)	(4.13)	**(57.70)**
	Large	13	33	13	4	**63**
		(1.45)	(3.70)	(1.45)	(0.45)	**(7.03)**
	Total	**199**	**461**	**189**	**47**	**896**
		(22.20)	**(51.45)**	**(21.09)**	**(5.25)**	**(100.00)**
	Chi square value	54.668 $p = 0.00$	124.453 $p = 0.00$	41.867 $p = 0.00$	33.549 $p = 0.00$	-

(The figure in the parentheses indicates percentage in total; Asterisk showed non-significant. Data showed significant at p< 0.05)

Table.4 Primary occupation of beneficiaries and non-beneficiaries

	Groups	Agriculture	Business	Services	Others	Total
Beneficiaries	Small	58	0	4	0	62
		(38.93)	(0.00)	(2.68)	(0.00)	(41.61)
	Medium	61	21	1	0	83
		(40.94)	(14.10)	(0.67)	(0.00)	(55.7)
	Large	3	1	0	0	4
		(2.01)	(0.67)	(0.00)	(0.00)	(2.68)
	Total	**122**	**22**	**5**	**0**	**149**
		(81.88)	**(14.77)**	**(3.35)**	**(0.00)**	**(100.00)**
Non-beneficiaries	Small	63	13	0	0	76
		(37.28)	(7.69)	(0.00)	(0.00)	(44.97)
	Medium	52	20	4	0	76
		(30.77)	(11.83)	(2.37)	(0.00)	(44.97)
	Large	5	2	0	0	7
		(2.96)	(1.18)	(0.00)	(0.00)	(4.14)
	Total	**120**	**45**	**4**	**0**	**169**
		(71.01)	**(26.62)**	**(2.37)**	**(0.00)**	**(100.00)**

(The figure in the parentheses indicates percentage in total)

Table.5 Secondary occupation of beneficiaries and non- beneficiaries

	Groups	Agriculture	Business	Services	Others	Total
Beneficiaries	Small	14	50	3	2	**69**
		(8.92)	(31.85)	(1.91)	(1.27)	**(43.95)**
	Medium	23	48	8	5	**84**
		(14.65)	(30.57)	(5.09)	(3.18)	**(53.50)**
	Large	1	3	0	0	**4**
		(0.64)	(1.91)	(0.00)	(0.00)	**(2.55)**
	Total	**38**	**101**	**11**	**7**	**157**
		(24.20)	**(64.33)**	**(7.01)**	**(4.46)**	**(100.00)**
Non-beneficiaries	Small	13	58	4	1	**76**
		(8.23)	(36.71)	(2.53)	(0.63)	**(48.10)**
	Medium	24	43	5	3	**75**
		(15.19)	(27.22)	(3.16)	(1.89)	**(47.47)**
	Large	2	5	0	0	**7**
		(1.26)	(3.16)	(0.00)	(0.00)	**(4.43)**
	Total	**39**	**106**	**9**	**4**	**158**
		(24.68)	**(67.09)**	**(5.70)**	**(2.53)**	**(100.00)**

(The figure in the parentheses indicates percentage in total)

Table.6 Tertiary occupation of beneficiaries and non- beneficiaries

	Groups	Agriculture	Business	Services	Others	Total
Beneficiaries	Small	0	0	7	0	**7**
		(0.00)	(0.00)	(38.89)	(0.00)	**(38.89)**
	Medium	0	0	5	6	**11**
		(0.00)	(0.00)	(27.78)	(33.33)	**(61.11)**
	Large	0	0	0	0	**0**
		(0.00)	(0.00)	(0.00)	(0.00)	**(0.00)**
	Total	**0**	**0**	**12**	**6**	**18**
		(0.00)	**(0.00)**	**(66.67)**	**(33.33)**	**(100.00)**
Non-beneficiaries	Small	0	0	8	0	**8**
		(0.00)	(0.00)	(38.10)	(0.00)	**(38.10)**
	Medium	0	0	8	5	**13**
		(0.00)	(0.00)	(38.1)	(23.81)	**(61.90)**
	Large	0	0	0	0	**0**
		(0.00)	(0.00)	(0.00)	(0.00)	**(0.00)**
	Total	**0**	**0**	**16**	**5**	**21**
		(0.00)	**(0.00)**	**(76.19)**	**(23.81)**	**(100.00)**

(The figure in the parentheses indicates percentage in total)

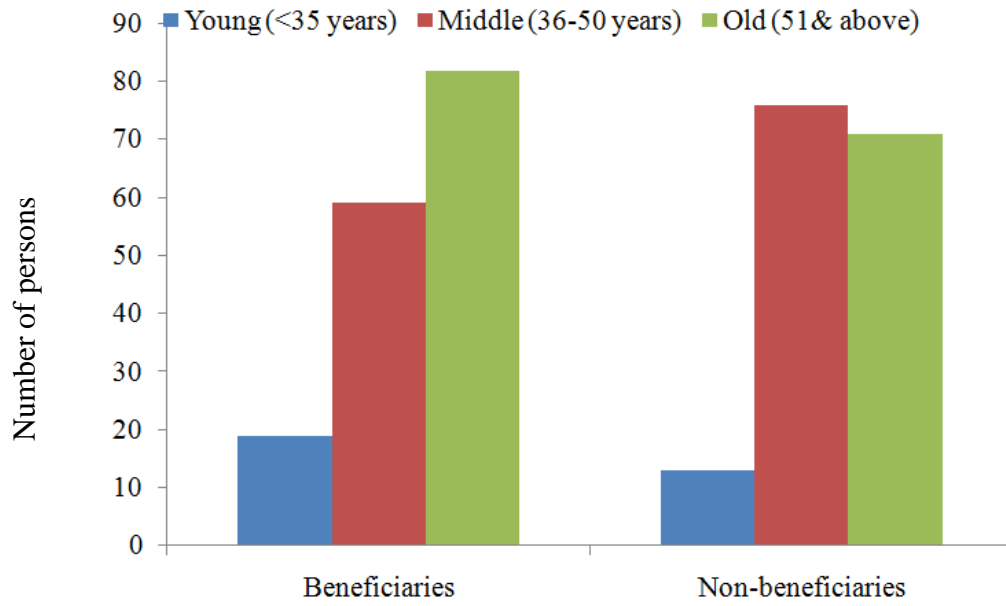**Fig.1** Age respondent family demography of beneficiaries and non-beneficiaries

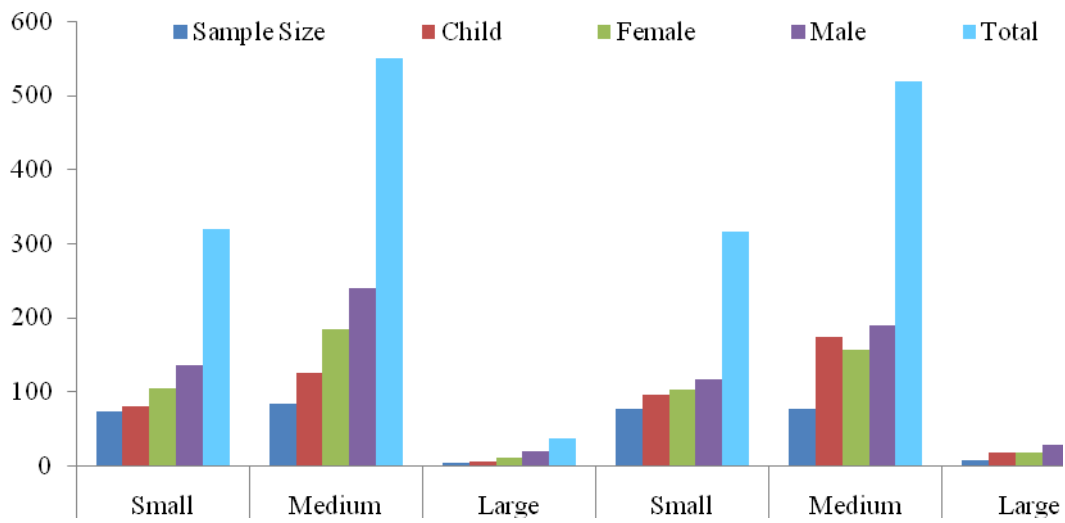**Fig.2** Distribution of respondent family demography of beneficiaries and non-beneficiaries.

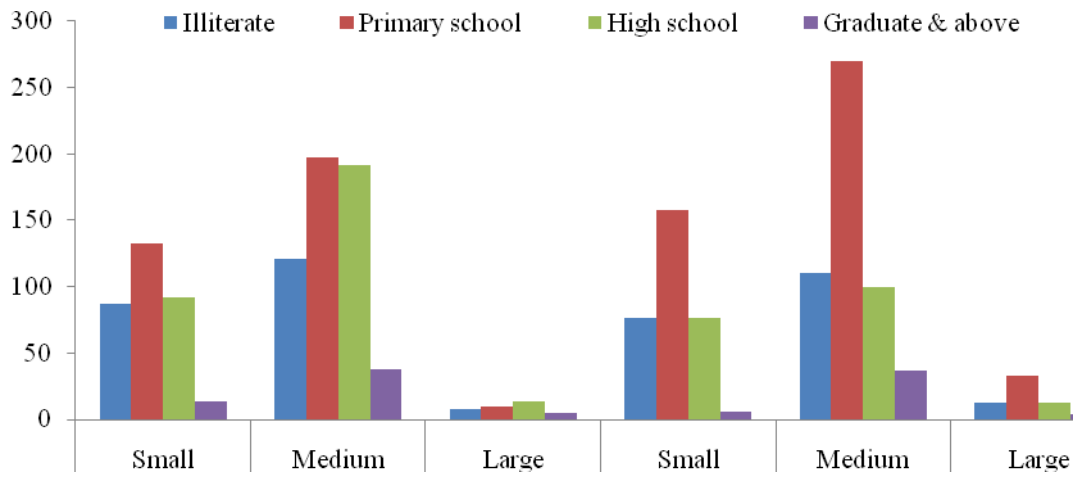**Fig.3** Distribution of respondent's of beneficiaries and non-beneficiaries

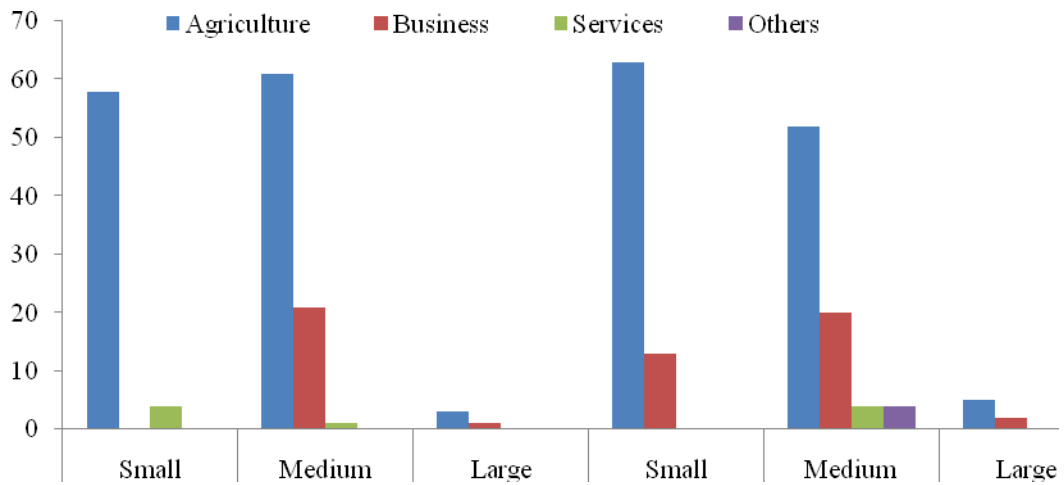**Fig.4** Primary occupation on beneficiaries and non-beneficiaries

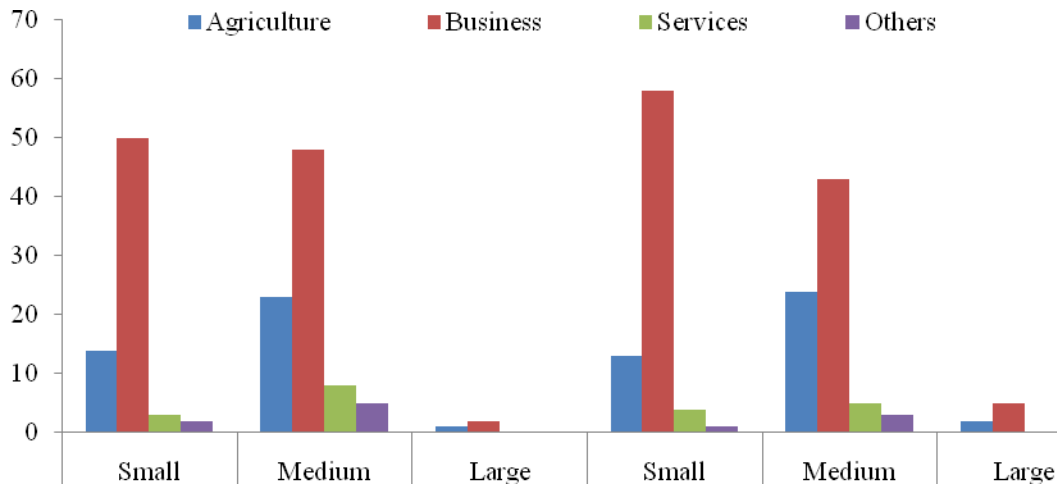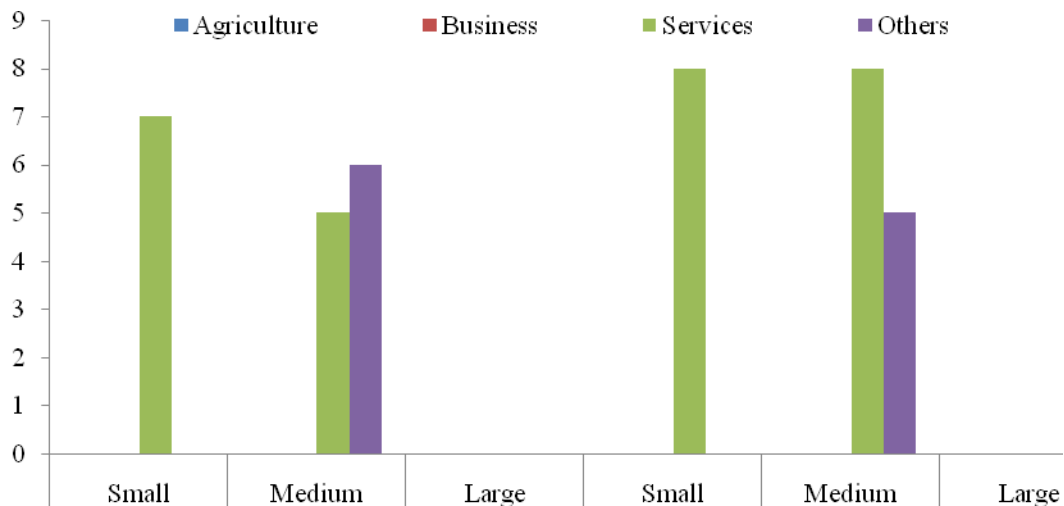**Fig.5** Distribution of occupation on beneficiaries and non-beneficiaries

Fig.6 Distribution of tertiary occupation of beneficiaries and non-beneficiaries

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