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Development of Marine Fish Production in India: An Analysis

D Amutha

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Abstract

In the Indian economy, fishery sector is one of the most important and contributory sectors. The study examines the trend and growth of marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu. The objectives of the present study are:

1. To find out the contribution of the fisheries sector production in India from 2005 to 2015.
2. To study the marine products market-wise exports from India to different countries during 2000-01 to 2017-18 and
3. To assess the trend and growth of marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu.

In order to analyze the trend and growth of marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu over a period, percentage methods, co-efficient of variations, linear trend and compound growth rate have used. The secondary data collected through the internet, books, newspaper, journals records and brochures from 2005 to 2015. It inferred that production performance of marine fish capture, on an average over a period was found to be higher than the production performance of inland fish capture. The study reveals that the marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu have been increasing at a compounded growth rate of 6.44 percent, 7.43 percent and 3.02 percent respectively. The trend coefficients are positive and significant at 5 percent level indicating a positive movement in the marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu. The trend coefficient for marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu is 0.032, 0.077 and 0.054. The analysis shows that trend in the marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu are positive and significant and the growth is increasing at a compounded rate of 6.44 percent, 7.43 percent and 3.02 percent respectively. The value R^2 indicates that the 86 to 68 percent variations in dependent variable explained by time variable.

Keywords: Marine resources; Fishery sector; Employment; Export earnings; Mechanised vessels.

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Introduction

Fishing is an ancient human production activity of mankind. It has developed universally throughout the world through centuries till today.¹ Fishery sector is the only sector which offers cheap and good animal protein to people, particularly to the economically weaker sections of society and thereby it is in an advantageous position to ensure

national food security.² The nature, process and problems of fishery are quite different compared to that of other sectors.³

The fishery sector is important to Indian economy as it provides employment for 95 lakhs fishermen, an average annual per capita supply of 3.5 kg of animal protein food, and about 4 percent of the nation's total export earnings.⁴ The actual annual average of marine fish production in India is 1.73 million tonnes.⁵ Fishery sector contributes about 4 percent to the Nation's total export earnings.⁶ The potential of average annual fish production is estimated to be 4.5 million tonnes.

The fishery sector has registered an impressive growth rate of over 60 percent in the last decade.⁷ Fisheries were essentially the source of livelihood for different sections of fish workers.⁸ The large scale exploitation of inshore fishery by mechanised vessels resulted in depletion of marine resources.⁹

There are fishing villages which are located among 13 maritime districts of Tamilnadu, namely, Chennai, Chengalpattu, Cuddalore, Nagapattinam, Mallipattinam, Pudukottai, Pathayr, Ramanathapuram, Rameswaram, Tuticorin, Mandabam, Colachel and Kanyakumari. The southern districts of Tamilnadu, Ramanathapuram, Tirunelveli, Thoothukudi and Kanyakumari together contributed 64.2 percent of total catch.¹⁰ The southern districts of Tamilnadu, Ramanathapuram, Tirunelveli, Thoothukudi and Kanyakumari together contributed 64.2 percent of the total catch.¹¹ The study examines the trend and growth of trend and growth of marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu.

Objectives

The objectives of the present study are:

1. To find out the contribution of the fisheries sector production in India from 2005 to 2015.
2. To study the marine products market-wise exports from India to different countries during 2000-01 to 2017-18 and
3. To assess the trend and growth of marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu.

Materials and Methods

In order to analyze the trend and growth of marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu over a period, percentage methods, coefficient of variations, linear trend and compound growth rate have used. The secondary data collected through the internet, books, newspaper, journals records and brochures from 2005 to 2015.

Fish Production in India

India lies to the north of the equator and it is bounded in the south by the Indian Ocean, in the west by Arabian Sea and in the east by Bay of Bengal. India consists of 28 states and 7 union territories of which there are 9 maritime states and 4 maritime union territories. In 1951 total fish production was about 0.8 million tonnes. This has increased to 3.8 million tonnes in 1990-91 and exceeds 5.6 million tonnes in 2007-2008.

The contribution from marine sources was slightly more than 51 percent. About 10 percent of fish production is exported bringing in foreign exchange earnings of ₹8607.97 crores in 2008-2009 (FSI, 2009). The traditional structure of Indian fishing is evident in the type of tools of production used in fishing and their ownership pattern. At present nearly 67 percent of fishing crafts engaged in marine fishing in India consists of purely traditional crafts (non-motorized); 20 percent are mechanized vessels, and about 13 percent are motorized traditional boats.

Traditional crafts, including motorized ones, therefore, comprise 80 percent of total boat population in India. It is interesting to note that as early as 1972, India had a total boat population of 230,000 of which traditional fishing crafts (including motorized) constituted about 94 percent and the remaining 6 percent were mechanized boats. Within a span of 37 years, the number of mechanized boats has increased from about 13000 to 57000, an increase by 270 percent and the number of traditional crafts has fallen from about 217000 to 150000, a fall by 15 percent.

Table 1 shows the total contribution of the fisheries sector production in India from 2005 to 2015.

Table 1: Fish production in India

Year	Marine (in million tonnes)	Percentage to total	Inland (in million tonnes)	Percentage to total	Total
2005	2.9	43.94	3.7	56.06	6.7
2006	3.2	45.07	3.9	54.93	7.0

(Contd.)

Year	Marine (in million tonnes)	Percentage to total	Inland (in million tonnes)	Percentage to total	Total
2007	3.1	44.29	3.9	55.71	6.9
2008	3.4	42.50	4.6	57.50	7.9
2009	3.3	41.77	4.6	58.23	7.8
2010	3.1	38.75	4.9	61.25	7.9
2011	3.8	43.68	4.9	56.32	8.2
2012	3.9	41.05	5.6	58.95	8.9
2013	3.8	42.22	5.2	57.78	9.0
2014	3.6	37.11	6.1	62.89	9.6
2015	3.4	34.34	6.5	65.66	10.0

Source: Fisheries Statistics, 2012, FAO Handbook on Fisheries Statistics, 2016, GoI, 2012, and CMFRI, various annual reports.

Comparative total fish production of inland and marine capture in India is presented in Table 1. In India, the total marine fish production was 6.7 million tonnes in 2005 and from which it increased to 10 million tonnes in 2015. The declining trend the marine fish production in the years 2007 and 2009 is due to monsoon conditions. However, in 2015 the marine fish production reached a peak level of 10 million tonnes. On the other hand, the marine capture fish production showed an increasing trend for 2.9 million tonnes in 2005 to 3.4 million tonnes in 2015, and the inland capture fish production showed an increasing trend for 3.7 million tonnes in 2005 to 6.5 million tonnes in 2015. From Table 1, it could

also see that production performance of inland capture of India's fish show a higher proportion than marine capture in all the years during the period 2005 to 2015. The proportion ranges from 56.06 percent during the year 2005 to 65.66 percent during the period 2015. The proportion of marine fish capture, which is 43.94 percent in 2005, had decreased to 34.34 percent during 2015 through the amount of production performance of marine capture showed a decreasing trend.

The average amount of fish production over a period and stability of performance of inland and marine fish capture in India during the period 2005 to 2015 presented in Table 2.

Table 2: Average level and stability of production of Inland and marine capture in India from 2005 to 2015

Particulars	Inland capture	Marine capture	Total fish production
Mean (X)	3.4091	4.9000	8.1727
Standard Deviation (S.D)	0.33001	0.90554	1.09735
Co-efficient of Variation (C.V)%	9.68	18.48	13.43

It inferred from Table 2 that production performance of marine fish capture, on an average over a period was found to be higher than the production performance of inland fish capture. The average amount over the period from 2005 to 2015 was 4.9000 million tonnes for marine fish capture and 3.4091 million tonnes for inland fish capture. The value of the coefficient of variation specifies that the production performance of inland fish capture was relatively stable over 11 years compared to production performance of marine fish capture. The marine products market-wise exports from India to different countries during 2000–01 to 2017–18 are exposed Table 3.

Table 3 brings the major fish export markets of India. USA, European Union, China, South East Asia and the Middle East are the dominant fish

export market for India. It is seen that the European Union and China have shown a positive trend, while Japan has shown a negative trend.

Fisheries in Tamil Nadu

Tamil Nadu supplying different species of inland and marine fish ranks fifth among Indian states. The fish production in the marine sector is better than that of inland sector. Tamil Nadu has a long and glorious tradition of maritime activity. It is by natural that marine fishing has become one of the earliest and important occupations of the people of Tamil Nadu.

Tamil Nadu is endowed with a long coastal length extending from Chennai to Kanyakumari, with 359 landing centres located on the coastline of

Table 3: Market wise marine products exports to different countries

Market	Quantity/ Value	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05	2005- 06	2006- 07	2007- 08	2008- 09	2009- 10	2010-11	2011- 12	2012- 13	2013-14	2014- 15	2015- 16	2016- 17	2017- 18
Japan	Quantity in ton	68983	64905	54916	50020	57832	59785	67437	67373	57271	62690	70714	85800	76648	71484	78772	75393	69039	85651
	Value in Crore	2560.39	1820.69	1534.76	1163.69	1202.45	1155.97	1353.38	1227.59	1234.01	1289.58	1683.39	2140.67	1999.59	2463.83	3040.26	2610.74	2621.37	2846.3
Usa	US\$ Million	562.75	383.07	317.17	253.86	266.96	262.79	299.2	305.49	278.61	278.56	373	456.35	372.57	410.95	502.29	403.48	394.5	445.27
	Quantity in ton	41747	49041	61703	53153	50045	55817	43758	36612	36877	33444	50095	68354	92447	110880	129667	153695	188617	247780
European Union	Value in Crore	1164.4	1421.38	2051.12	1682.06	1556.09	1639.24	1347.8	1016.94	1021.55	1012.52	1990.26	2977.53	4026.48	7744.67	8830.12	8633.4	11482.16	14769.8
	US\$ Million	255.93	299.05	424.51	365.84	345.52	372.62	297.08	253.05	227.29	213.52	438.49	637.53	747.45	1286.04	1458.24	1334.05	1731.81	2320.05
China	Quantity in ton	68827	82895	94541	96284	117742	136842	149773	149381	155161	164800	170963	154221	158357	174686	188031	186349	189833	190314
	Value in Crore	1025.34	1150.07	1388.47	1470.99	1819.28	2134.25	2760.32	2664.24	2854.07	3013.33	3459.4	3810.44	4176.42	6129.69	6715.58	6311.45	6892.19	7115.96
South East Asia	US\$ Million	225.37	241.97	287.84	319.95	405.4	484.02	610.95	663.18	635.34	637.4	765.15	805.38	777.41	1013.28	1106.67	970.77	1038.59	1116.74
	Quantity in ton	182771	134767	170811	123738	124826	137076	203513	139792	147312	144290	159147	84515	87776	75783	59519	50042	45443	49701
Middle East	Value in Crore	827.42	597.23	762.48	676.46	693.25	849.45	1156.96	1009.59	1296.39	1790.89	1977.81	1259.23	1444.86	1766.72	1349	1432.25	1341.94	1448.03
	US\$ Million	181.86	125.66	158.23	151.6	154.1	191.99	259.06	252.9	281.9	379.7	440.1	263.3	269.47	293.12	221.44	220.69	202.19	227.39
Others	Quantity in ton	40748	52424	44097	50670	63842	60140	67650	63818	88953	149353	233964	343962	340944	380061	409931	328900	484819	616707
	Value in Crore	462.97	538.75	642.38	545.77	628.83	585.85	616.7	573.97	873.09	1479.55	2114.48	4193.27	4357.28	8046.59	8620.85	7499.16	11461.83	14250.3
Total	US\$ Million	101.76	113.35	133.15	119.13	139.77	132.7	136.43	143.5	191.08	314.85	469.36	880.09	811.8	1320.95	1416.82	1152.86	1728.19	2237.07
	Quantity in ton	17236	19159	19668	14711	16624	22270	23585	25752	27177	34907	43983	38155	41419	58040	64608	5w3905	52973	62220
Others	Value in Crore	188.32	181.06	204.74	201.52	244.42	307.65	371.06	393.96	475.72	553.55	670.35	894.38	1113.34	1599.37	2020.86	1793.67	1830.58	1849.1
	US\$ Million	41.39	38.1	42.4	43.92	54.7	69.64	82.47	98.05	105.2	117.05	148.31	186.85	209.26	272.65	333.1	276.46	275.93	290.46
Total	Quantity in ton	20161	21279	21561	23441	30418	40234	56924	58972	90083	88953	84225	87014	130623	112822	120716	97609	104224	124871
	Value in Crore	215.05	247.87	297.36	351.46	502.37	572.9	757.3	734.62	853.11	909.11	1005.77	1321.72	1738.29	2462.4	2864.93	2140.16	2240.83	2827.4
Total	US\$ Million	47.26	52.15	61.6	76.46	112.03	130.44	167.75	182.93	189.22	191.77	222.5	278.94	323.71	410.71	472.56	329.62	406.4	444.57
	Quantity in ton	440473	424470	467297	412017	461329	512164	612641	541701	602835	678436	813091	862021	928215	983756	1051243	945892	1134948	1377244
Total	Value in Crore	6443.89	5957.05	6881.31	6091.95	6646.69	7245.3	8363.53	7620.92	8607.94	10048.5	12901.47	16597.2	18856.3	30213.26	33441.6	30420.8	37870.9	45106.9
	US\$ Million	1416.32	1253.35	1424.9	1330.76	1478.48	1644.21	1852.93	1899.09	1908.63	2132.84	2856.92	3508.45	3511.67	5007.7	5511.12	4687.94	5777.61	7081.55

Source: www.mpeda.gov.in, 2018

eight marine districts alleged with a number of fish landing centre. There are 8 major fishing harbours in Tamil Nadu. Marine fishing is predominant in the districts of Ramanathapuram, Nagapattinam, Kanyakumar, Pudukottai and Caddalore.

Actual marine fish production is for below the potential production because of adoption of traditional fishing technique. Modernisation of crafts is a need of the hour. Having almost reached a plateau in fish catch from the coastal water, deep sea fishing is to be given needed fillip. Survey of new fishing grounds, increased efficiency of fishing crafts through mechanization, creation of adequate infrastructure facilities at landing centres, improved trawlers, adoption of intensive fish cultures and additional thrust to brackish water fish farming is indispensable for elevating the marine fish production in the state.

In Tamil Nadu mechanised crafts, motorised crafts and non-mechanised crafts are operated with various gears combination. In 2000, an increase of 218.58 percent in the mechanized craft is recorded. Mechanisation of fishery operations has resulted in enhanced production. Such an increase in fish landings improves productivity and generates an income; promote development of infrastructural facilities in several areas and above all supplies

additional quantum of much protein rich fish for the growing population.

Mechanisation of fishing crafts is progressively on the increase in Tamil Nadu. Marine fish landings when worked out per boat show that mechanization had contributed to a much of higher level of efficiency than the traditional methods adopted. Fish catch by mechanized units is heavier than non-mechanised units in respect of Chennai, Pudukottai, Ramanathapuram, Tuticorin and Tirunelveli districts. In order to improve fishing production, besides speeding up mechanization offshore and deep sea exploitation should be encouraged by providing adequate cold storage and marketing facilities throughout the year.

The craft-wise marine fish production in Tamil Nadu for the year 2009–2010 is portrayed in Table 4. Portrays the craft-wise marine fish production in Tamil Nadu for the year 2009–2010. The total marine fish production during the year is 401566 tonnes. Among the districts of Tamil Nadu, Ramanathapuram District occupied the first place in marine fish production with 72281.88 tonnes. In non-mechanised also, Ramanathapuram District marked a high level of 14709.36 tonnes. In Tamil Nadu, mechanised fish production was more than non-mechanised and other types of crafts.

Table 4: Craft wise marine fish production by districts of Tamil Nadu

S. No.	District	Marine Fish (Quantity in Tonnes)								Total
		Mechanised	Percentage to total	Non-mechanised	Percentage to total	Motorized	Percentage to total	Shore Seine	Percentage to total	
1.	Chennai	17452.70	71.01	6374.06	28.99	7125.79	95.07	369.60	4.93	31322.15
2.	Tiruvallur	4475.05	71.01	1634.37	28.99	1827.13	95.07	94.77	4.93	8031.32
3.	Kancheepuram	11187.63	71.01	4085.93	28.99	4567.81	95.07	236.92	4.93	20078.30
4.	Villupuram	7831.34	71.01	2860.15	28.99	3197.47	95.07	165.85	4.93	14054.81
5.	Cuddalore	12306.39	71.01	4494.53	28.99	5024.59	95.07	260.82	4.93	22086.13
6.	Nagapattinam	50344.33	73.25	18386.70	26.75	20555.16	95.07	1066.16	4.93	90352.35
7.	Thiruvarur									
8.	Thanjavur									
9.	Pudukkottai	20585.24	71.01	7518.12	28.99	8404.78	95.07	435.94	4.93	36944.07
10.	Ramanathapuram	40275.46	71.01	14709.36	28.99	16444.13	95.07	852.93	4.93	72281.88
11.	Thoothukudi	31325.26	71.01	11440.62	28.99	12789.88	95.07	663.39	4.93	56219.24
12.	Tirunelveli	4475.05	71.01	1634.37	28.99	1827.13	95.07	94.77	4.93	8031.32
13.	Kanyakumari	23494.02	71.01	8580.46	28.99	9592.41	95.07	497.54	4.93	42164.43

Source: Commissioner of Fisheries, Chennai – 6

The result of the analysis showing trend and growth of marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu presented in Table 5.

Table 5 reveals that the marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu have been increasing at a compounded growth rate of 6.44 percent, 7.43 percent and 3.02 percent

respectively. The trend coefficients are positive and significant at 5 percent level indicating a positive movement in the marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu. The trend coefficient for marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu is 0.032, 0.077 and 0.054.

Table 5: Trend and growth of marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu

Trend Equation: $\log w = a + bt$

Particulars	Trend Coefficients		R^2	CGR (percentage)
	a	b		
Marine fish production in India	24.17	0.032* (13.73)	0.72	6.44
Market-wise exports from India	25.52	0.077* (19.22)	0.86	7.43
Craft-wise marine fish production in Tamil Nadu	21.11	0.054* (11.03)	0.68	3.02

*Significant at 5 percent level.

Note: CGR = Compound Growth Rate

Figures in parentheses indicate t -values.

The analysis shows that trend in the marine fish production in India, market-wise exports from India and craft-wise marine fish production in Tamil Nadu are positive and significant and the growth is increasing at a compounded rate of 6.44 percent, 7.43 percent and 3.02 percent respectively. The value R^2 indicates that the 86 to 68 percent variations in dependent variable explained by time variable.

Conclusion

The present study focuses on amplification the keenness of seafood trade of India and its competence and relative advantage in Indian market. These results have clearly shown that India does have relative benefit in exporting fish and fish products. It is optimistic sign for fisheries as rising business and highlighted for the additional growth and study in order to make fisheries more profitable and modest in international market.

However till the production of Fisheries in India is very less compared to other countries in the world. Hence, the proper attention and care has to be taken by the government, Fisher Folks, Tourists, People residing near coastal area to take a pledge against usage of plastics, petrol, oil based boats for fishing, using chemicals for faster growth of fish, following the restrictions made by the government.

Government has to take necessary steps to solve the problems between the countries to protect the fishermen and to have a cordial relationship between other countries. By following these production of fisheries can be increased. It will automatically increase the production of fishes in the coastal areas rather than the fish growing centres.

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Psycho-Social and Educational Impact of Flood among School Going Children

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Abstract

Background: Disasters being unanticipated events by their nature results in extremely destructive consequences. It disrupts the lives of trillions and among which children are the most vulnerable. There is a need for a study of the impacts of those events in the current society especially among children where always interventions used to meet their needs and demands are based on top-down approaches. The disasters especially, floods have a huge impact in all spheres of life including psychological, social and educational and its effects may persist for life long if not intervened properly. This study plan to measure the psycho-social and educational impact of flood among school-going children in Kerala in the background of 2018 flood.

Methods: Semi-structured Quantitative questionnaires along with CRIES 13 Scale was used among the flood-affected students under Aluva Sub-district who were in rehabilitation camps using random sampling with a size of 100 samples. The results of focused group discussions conducted among children and their class in charges were also accustomed to support the data. Statistical Package for the Social Sciences (SPSS) version 21 was used to analyze data.

Results: After six month of event 60% of the participants (41% of female and 19% of male) started to show PTSD symptoms. Lack of psychological first aid and counselling had impacted in absentism in schools after re-opening and children have reported poor concentration and other symptoms of psychological disorder in a context where they had lost properties, notebooks, uniforms, family members, close friends, pets, damaged school buildings and their family background where most of the parents are working in the informal sectors and are suffering to rebuild their homes.

Conclusion and Suggestions: The study established that floods impacted is more among girls than boys. It is also evident that the basic needs of the children were not taken into consideration in the camps and it's a violation of their fundamental rights to survival, development and protection. The study suggests that every child need to be given training on disaster risk reduction and prevention measures to avoid trauma after the disaster. It needs to be a mandatory part of the curriculum and policies.

Keywords: Disaster; Flood; Psycho-Social; Children.

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Introduction

Disasters are unanticipated events that can result in extremely destructive consequences. It disrupts the lives of millions. In a global context, a minimum average of one disaster occurs per day.¹ The Emergency Event Database (EM-DAT), shows that 10,733 lives were cost by 281 climate-related events only in 2018. And it also counts about that 6 crore

mankind were affected. Around half of total deaths due to disasters in 2018 were recorded in Indonesia, and it is India which recorded around half of its total population affected.² Floods are considered to be the second-most widespread natural disaster. Worst floods in the past 100 years were witnessed by China's yellow river valley among which flood of Yellow River in 1931 drowned about one million people and made many homeless.³ In the last century, the main cause of natural disasters and the reason for 6.8 million deaths were floods. The most flood-affected region of the last quarter of the previous century is Asia as there reported flood-related fatalities nearly to 50%.⁴

Floods in Indian Scenario

India is a vulnerable country due to the changing frequencies of large number of both natural and man-made disasters. The Disaster Management Policy, 2009 reveals that 4 crore hectares which is about dozen per cent of India's land are liable to floods and river erosion.⁵ River floods are common in India and about 5 million people are exposed to river flooding in every year.⁶ The last 65 years' estimation of damage due to flood is calculated as of amount ₹37,82,47,04,70,000.⁷ Data reveals that 2087.61 million people were high flown and 1,07,535 lives were lost by floods and heavy rainfall from 1953 till 2017 in India. The damage to Public Utilities has calculated as 2,12,060 crore rupees, loss of agricultural crops in 256.02 hectares area and 60,49,349 number of cattle lost and 8,07,17,993 houses were destroyed and an area of 466.335 million hectares affected.^{7,8}

"Floods are the most common natural disaster," says Encyclopaedia.⁹ The reports of CRED recorded 108 of floods in 2018. India witnessed the largest flood event of the year through the August flooding in Kerala where over 23 million humans were contrived with 504 deaths.² The downpour of monsoon floods which Kerala witnessed was the worst disaster in its 100 years.⁷ The impact of the flood can be due to both natural as well as human-induced factors. Intense rainfall in short span contributes to flood hazard.¹⁰ The Center for Research on the Epidemiology of Disaster (CRED) defines a flood as "a significant rise of water level in a stream, lake, reservoir or coastal region".¹¹ Climatological forces, vegetation clearing, urban development, exploitation on river catchments and land, deforestation and so on have increased the immensity and character of floods.^{12,13} Vulnerability of mankind to disaster is mostly contriving weaker section especially related with with social and

economic aspects. Elderly persons, women, children especially women rendered destitute, children orphaned on account of disasters and differently-abled persons are under high risk category.⁵

Impact of Disaster among Children

There are lots of studies related to the impact of disasters among children from different age groups. The damage caused to children's physical health, chances for malnutrition and diarrheal illness due to contaminated water are the three long-lasting effects that can cause harm to children during natural disasters disproportionately.¹⁴ 13.9% among 2030 children were reported subjection throughout life in a study conducted from the United States (US) and 4.1% were encountering a previous disaster. Its abide that the mental health of children exposed to victimization, disaster or both was worst compared to the rest.¹⁵ Psychiatric reports of Buffalo Creek dam collapse in 1972 after 2 years of the disaster found 37% of children with Post-Traumatic Stress Disorder (PTSD) symptoms. Also noticed that girls had higher symptom levels than boys.

Age, gender, parents' functioning, home environment and unique individual experience of disaster by children are the common factors of symptom.¹⁶ A positive correlation of PTSD criteria symptoms with measure of risk to trauma was evident from the study after 28 months of 1997 Flood in south-western Poland during the disaster. Also noted that young participants and girls showed more PTSD symptoms.¹⁷

It is also found that over parental control and infantilization of children for a long time after a disaster are harmful to adolescents' health and could be an obstacle in the recovery process.¹⁸ The study conducted in Namibia related to extreme flooding of 2011, have assessed post-traumatic stress disorder (PTSD) on school children after 2 years of the event and noted that even after 2 years, 55.2% of learners of age 12 and below and 72.8% of learners of age 13 and above have symptoms of trauma.¹⁹

The study which reviewed conceptual advances of last 10 years found less number of effective interventions for victims especially children and youth and suggested to bring informative strategies through researches to protect and promote resilience.²⁰ Early exposure is observed to be a threat factor for anthropometric failure in children in the study conducted in 14 flooded and 18 non-flooded villages of Orissa.²¹ The results of the study on the impact of the 2009 flood on children in North Karnataka indicated a higher level of intrusion and

avoidance aftermath of floods. It also mentioned psychological impact is more significant for boys than girls.²² Similar results with high levels of intrusion and avoidance shown by the children from a study conducted in Kashmir.²³

Floods in Kerala

The state Kerala, in India having two main monsoons as South-west and North-east, provides an average annual rainfall of about 3000 mm. It is this rainfall which results in 90% heavy oozing in 44 rivers of the state.⁶ Because of its geographical location with the Western Ghats on one side and the sea coast on other make Kerala highly vulnerable to natural disasters and the changing climatic dynamics. Devastating massive flooding of 2018, was an unexpected one because of which people were not prepared and resulted in heavy human and economic consequences. It was severe flash floods that are sudden flooding within the short duration that resulted in the damages, with cost 504 lives and two-thirds of the state's population affected (over 23 million people).

The Post-Disaster Needs Assessment (PDNA) report of Kerala says that people have been affected in multiple of ways during the anticipatory period, cleanup and recovery phase. Stress and emotional hardship because of damage to properties including personal properties like homes, vehicles and so on creating financial burden. Floodwaters damaged land by eroding shorelines and disrobing soils. The fertility and natural vegetation is also lost in the path of the flowing water. Hazardous living conditions since the water was not cleaned up immediately. Floodwaters carried with them many health and injury risks, including diseases and hazards such as sharp glass or metals. Alluvion also contaminated water sources, demolished drainage systems and afflicted farm crops.²⁴ CRED reports that it was flash floods which Kerala faced and it was the intense rainfall resulted in inland flooding. Previously it was in 1924 unparalleled heavy floods was witnessed in almost all rivers of Kerala that resulted in huge damage to properties and crops, losses to life, and so on.⁶

Table 1: Impact of floods in the state Kerala (last 6 decades)

Year (in decades)	Affected area (in M.ha)	Population affected in millions)	Loss of human life (in numbers)	Total damage crops, houses, public utilities (in ₹ Crore)
1957-1966	0.49	1.39	215	2.338
1967-1976	1.39	8.13	369	60.404
1977-1986	1.8	43.26	791	1231.753
1987-1996	3.711	24.947	1089	3399.968
1997-2006	0.585	2.139	462	1412.312
2007-2016	0.043	4.708	926	2016.683

Source: (Central Water Commission, 2018)

Objective of the Study

To explore the psychosocial and educational impact of flood among school-going children in Kerala with special reference to 2018 flood.

Materials and Methods

This exploratory study was conducted in Educational Institutions under the Aluva Sub-District Education Office in Ernakulam District of Kerala. The sample size of the study was 100 (Boys 50 and Girls 50). The study followed random sampling. The qualitative narrations and results of focus group discussions are added to support the data collected through a survey conducted among the children of age between 12 and 18 who stayed

in rehabilitation camps atleast for one week. The CRIES-13 Scale tool.²⁵ which is stable across age and gender with arousal items to classify children with and without PTSD^{26,27} were used to measure PTSD symptoms. Data were analysed through the Statistical Package for the Social Sciences (SPSS) version 21.0. The data collection was done from the middle of February to March 2019.

Results

The present study explored the psychosocial and educational impact of flood among 100 with 50% Girls and 50% Boys school-going children in the context of 2018 Kerala floods. All the participants ($n = 100$) were aged between 12 and 18 years.

Table 2: Socio-demographic details of the respondents

(N = 100)

Parameters		Frequency	Percentage
Gender	Male	50	50
	Female	50	50
Age	12 to 14 years	72	72
	15 to 17 years	28	28
Community	General	9	9
	OBC	68	68
	SC	18	18
	ST	5	5
Education	7 th	35	35
	8 th	19	19
	9 th	20	20
	10 th	17	17
	11 th	1	1
	12 th	8	8
Type of family	Nuclear	89	89
	Joint	3	3
	Extended	2	2
	Single Parent	5	5
	Other guardians	1	1
Number of earning members in family	None	4	4
	One	47	47
	Two	43	43
	Three	5	5
	Four and above	1	1

Table 2 shows the classification of school-going children based on the socio-demographic details. 72% of children belonged to the first category of the age group from 12 to 14 years and the rest 28% belonged to the next category of age from 15 to 17 years of age. It is clear from the table that 50 out of 100 respondents were girls and the next 50 were boys. 68% of respondents belonged to Other Backward Class (OBC) and 18% to Scheduled Caste

(SC), 9% General category and 5% Scheduled Tribe (ST). 35% of the respondents were studying in 7th standard, 20% in 9th standard, 19% in 8th standard, 17% in 10th standard, 8% in 12th standard and 1% in 11th standard. 89% of the total respondents belong to nuclear family set up which is common in Kerala and 5% single parent-child, 2% from a joint family, 3% from extended family and 1% are looked after by other guardians.

Table 3: Physical losses and psychosocial-educational impact

Parameters	Frequency	Percentage
PTSD Symptoms	60	60
Female	41	41
Male	19	19
Loss of property	7	79
Loss of family members	18	18
Yes	Avoidal of functions/events	31
	Thought of suicidal attempt	14
	Fear to word "flood"	49
	Irritability while discussing flood	28
	Reminders of flood	74
	Damage to School	17
	Loss of notes	53
	Loss of uniforms	59
	Continuous leave	40
	Support from parents/ guardians	94

(Contd.)

Parameters	Frequency	Percentage
Receival of counselling	75	75
Able to concentrate	74	74
Support from teachers and friends	93	93
Syllabus coverage	92	92
Training in disaster risk reduction/ prevention measures	41	41

Table 3 reveals that 60% of the respondents are having PTSD symptoms even after months of flood disaster. The researcher observed gloomy disturbed faces of respondents while discussing flood. 79% of them reported loss of property while 21% of them had no such severe losses. It shows that 18% of the respondents lost their family members or relatives in the flood while the rest 82% of them reported not. 31% of the respondents used to avoid functions like marriages or other events after the flood. 64% of them had no such problems. 14% of the respondents reported that either themselves or close ones to the respondents had thought of suicidal attempts or have tried. Among which 9% are girls. 49%, nearly half of the total respondents said that still, they have fear while hearing the word 'flood'. Children were responding "Let it never come again," "If another flood happens, we will die" the responded during focus group discussions. 72% of the respondents have no issues while discussing flood but the rest of the 28% feels irritability while discussing it. "Why are you asking about flood even after all those got settled down?" reacted a respondent during the focus group discussion. 17% reported the damage to their schools. The researcher found the broken desks and benches in school compounds. 53% of the respondents had lost their notebooks during

the flood. From the above-given table, it is clear that 59% of the school-going children have lost their uniforms in flood. The table discloses 40% of the respondents have taken continuous leave from schools even after the flood got settled. "Contaminated water, House Cleaning, fever,, to change the house, lack of uniform, lack of dresses, No reason, Eye operation, For consulting doctor, Diseases, Lost books, bag, uniform, Bad water, Repair of house, School Cleaning, Stomach pain, Sneeze, Hospitalized" were the responses. 94% of the respondents were receiving support from their parents or guardians to continue studies and focus the studies. The data in the table depicts that 75% of the children received counselling from the school after rejoining. But 15% disclosed they havenot received. 74% of the children affected by the flood have no concentration problems. But the remaining 16% have issues. About 93% of the students responded that they got help and support from friends and teachers to maintain their focus on studies. 92% of respondents say that the syllabus has been covered by the teachers and 8% reported not. The data given in the table shows that only 41% received disaster risk reduction or prevention training from schools. But 59% of them reported not.

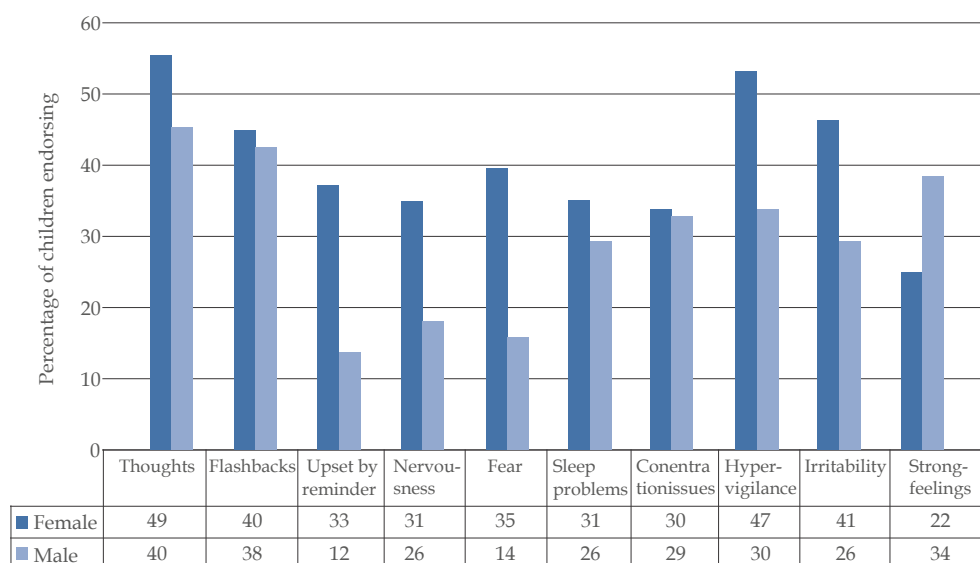


Fig. 1: Percentage of children endorsing with symptoms of PTSD

The Fig. 1 indicates that 89% of the total participants were still worried by the thoughts or memories of flood among which 49% are female and 40% male. 78% of them reported flashbacks,

45% shows upset by reminders, 57% nervousness, 49% fear, 57% sleep problems, 59% are facing concentration issues, 77 with hypervigilance, 67 with irritability, 44% waves of strong feelings.

Table 4: Impact on basic child rights

(N = 100)

	Parameters	Frequency	Percentage
No	Enough food in the camp	20	20
	Safe water	19	19
	Injuries	70	70
	Disease	63	63
	Medical assistance	32	32
	Satisfaction with camp facilities	26	26
Yes	Physical abuse	6	6
	Discrimination	17	17
	Non-receipt of PFA or counselling	26	26
	Lack of enough face to sleep	72	72

The data represented in Table 4 reveals that 80% of the respondents got enough food in the camp while the condition of 20% of them was pathetic. "The food that we received was having bad smell and taste, it seemed to be old food" In contrast to this respond "We were having biriyani, fried rice...it was like a festival for us" responded two different participants. The quality water was available for 81% of the respondents and the remaining 19% suffered even for safe water in some camps. "It was difficult to catch the water bottle dropping from helicopters to the camp... most of them were lost to mud water" "Our camp was isolated as it got surrounded by water" responses from focus group discussion. 30% of the respondents reported injuries during the flood. "I and my brother got injured while running away from home seeing flood" responded during focus group discussion.

From the table 4, it is clear that 37% of respondents suffered from diseases during the flood. Fever, Cough, Cold, Jaundice, Stomach pain were some of it. 68% of the respondents reported that medical assistance was available in the camps but for 32% of the respondents, it was not in the camp. "My brother suffered from fever for many days, but no medicines were provided". 6% of the respondents mentioned that they were physically abused in the camps. 17% of the respondents felt

that they have been discriminated in the camp. Only 26% of the respondents received either Psychological First Aid (PFA) or counselling in the camp. 72% of the respondents reported for enough space to sleep and the rest 18% reported its lack." It was congested, so we changed the camp after one week" from focus group discussion. 74% of the respondents indicated high satisfaction level while others, 26% of them were not. Lack of sanitation facilities, unavailability of food and water, difficulty in sanitary pad disposal and so on. No electricity, Lack of water, Lack of sanitation facilities, Pad disposal, congested area, light, Not hygienic, Lack of water in toilet, Lack of enough number of toilets, Pipe leakage in the toilet, Camp submerged and so on were the responses.

From the figure 2, it is clear that the basic fundamental rights of children especially for girls seem to be violated more. 17% of girls reported that they were not provided with enough food, 15% with issues related to water, 16% mentioned that lack of space to sleep was a problem in the camp, 4% of them even revealed that they were physically abused, 9% of them disclosed that they felt discriminated also. 39% of them reported neither receipt of psychological first aid nor counselling. Injuries were reported more by boys of 23%, lack of medical assistance was endorsed by 17% boys and 15% girls.

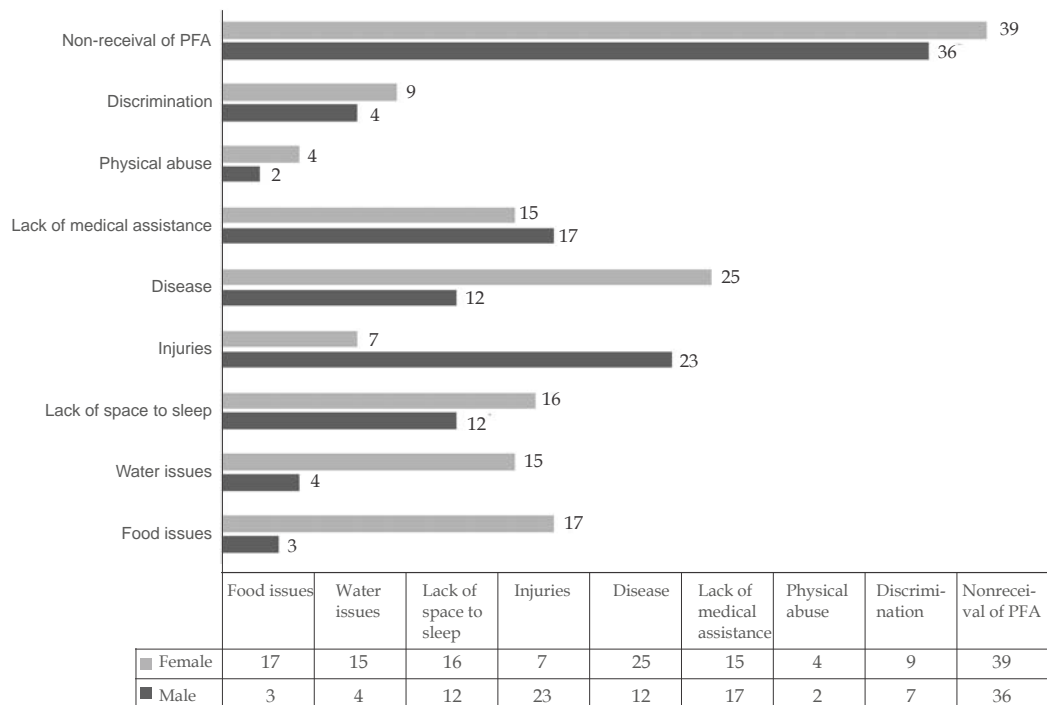


Fig. 2: Descriptive statistics of flood impact on basic child right by gender.

Discussion

Sixty percent of the participants are having PTSD symptoms after six months of the event. During the flood, 20% of the children reported that they faced difficulty in getting enough food in the camps and 19% suffered even for safe water. 28% of them reported a lack of enough space to sleep which are the basic needs of a human being. 32% of the respondents reported that medical assistance was unavailable for them in the camp in a context where 30% of the respondents reported injuries and 37% of respondents suffered from diseases during the flood.

Psychosocial impact of flood

The findings of the CRIES 13 Scale questionnaire are alarming as it shows that, 6 months after the event, children were still experiencing symptoms of trauma. The score greater than or equal to seventeen of PTSD symptoms which was shown by 60% of the total participants, among which, both gender categories of children with mean score of 17 included 41% of female and 19% of male suggesting that the effects of the floods are a cause for concern to the researcher. 49%, nearly half of the total respondents said that still, they have fear while hearing the word 'flood.' According to the findings and observation of the researcher with this current study, it's found that psychological injuries, physiological problems, re-encountering, avoidance,

intrusion, arousal, the tenacity of emotional trauma, troublesome behaviour, depression, abstention, disappointment and so on which are symptoms of other psychological disorders were existing. The Post Disaster Need Assessment (PDNA) reports the pathetic condition of 90% informal sector workforce of Kerala whose employment displacement for 45 days resulted in wage loss.²⁴ To this context the findings can be added and understood in connection to it as 80% of the 39 respondents' fathers are working in unorganized sector and 51% of the mothers of respondents are homemakers. 79% of them reported loss of property and 18% of the respondents lost their family members or relatives in the flood. 49% of them reported that their houses are not still in sound condition. Even 31% of the respondents used to avoid functions like marriages or other events after flood. 14% of the respondents reported that either themselves or close ones to the respondents had thought of suicidal attempts or have tried.

Impact on basic child rights

Twenty percent of the children reported that they faced difficulty in getting enough food in the camps and 19% suffered even for safe water. 28% of them reported a lack of enough space to sleep which are the basic needs of a human being. 32% of the respondents reported that medical assistance was unavailable for them in the camp in a context

where 30% of the respondents reported injuries and 37% of respondents suffered from diseases during the flood. Though no epidemic burst out but reported considerable destruction to health facilities.²⁴ Receival of Psychological First Aid (PFA) or counselling were reported by only 26% of the respondents. At the same time, 6% of the respondents said that they were physically abused in the camps. 17% of the respondents felt that they have been discriminated in the camp.

Impact and psychosocial support for educational attainment

Loss of note-books by 53% of the respondents, loss of uniform by 59%, continuous leave by 40% of the respondents, poor concentration by 26% were the impacts of the flood. PDNA reported 20% of less attendance in schools, the anxiety of class X and XII students in a context where they faced lots of loss as books and notes. Though PDNA expected more dropouts from school especially girls, such cases were not reported from the institutions where the research was conducted. 17% reported for damage occurred to their school. Academic activities were affected all over Kerala because of the shutdown of schools for about 23 days and about 1613 schools directly got affected during the floods.²⁴ The 94% of the participants reported support from parents/guardians to continue studies and focus the studies and 93% of the students responded that they got help and support from friends and teachers to maintain their focus on studies. Also, 92% of respondents say that the syllabus has been covered by the teachers. Among the total participants, 75% of the children received counselling from the school after rejoining and 49% of the children reported training in disaster risk reduction and prevention measures

Limitations of the Study

The sample design did not take into consideration of all age groups of school-going children and also excluded those flood affected who were at relatives' and friends' home and children with special needs. Due to the random selection, an age-wise impact assessment was not possible. The study is confined to a particular region while the whole State of Kerala has been affected by 2018 floods.

Ethical Consideration

The researcher has obtained permission from the Head of the institutions where the respondents

were studying. The researcher administered the questionnaire and has ensured participation with own will. The procedure of research along with nature, and duration, their rights as participants were also informed. The confidentiality of the respondents and collected data are ensured as safe.

Conclusion and Suggestions

It is obvious from the study that floods have adverse psychosocial, physical and educational impact on children. The current study discloses that more than half of the children (60%) including 49% of girls even 6 months after the disastersuffer from symptoms of PTSD. While considering the consequences of this issue, psychological counsellingis inferred as the topmost necessary service to be provided for them. Also, it's really important to be provided immediately after the disaster to avoid the trauma that may persist for life long. It is also found that the fundamental rights of children are not always getting protected or taken into consideration in humanitarian settings like rehabilitation camps during disasters. There are also issues related to gender insensitiveness in the camps. Girls were facing issues of sanitary napkin disposal, hygiene issues and so on in camps. Other major problems in the camp include unavailability of food and water while it gets accumulated in some other camps.

The services such as psychological first aid and counselling though existed for the name in both schools and camps, it was not reached properly. It reminds of the need for enough experts as well as professionals especially Social Work professionals in every school as well as in camps isto provide these services. Networking and coordination issues were also there in the camps. This context also reminds us of the need for Social Work professionals. Children need to be given training on disaster risk reduction and prevention measures to avoid trauma after the disaster. It needs to be part of the curriculum and policies. If implemented properly, present state government policy, Nava Kerala Mission can also bring about changes which plan for rebuilding a green and resilient Kerala by making use of crisis as an opportunity that has also given importance to education. Also, there is a real need for inclusive and children-centred-researches considering their gender and physical as well as psychological needs and issues of those children during and after such disasters and the policies need to be modified based on it.

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Antecedents of Dependence on Informal Credit by Rural Households: Evidences from Kerala

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Abstract

Informal credits are penetrating into the normal life of rural households in an unprecedented manner. There are several factors which influence rural households to borrow money from informal lenders at a rate unusually higher than the normal rate. This study identifies the antecedents of dependence on informal credit using empirical evidences from rural households in Kerala. Quick access to informal credit, poor access to formal credit and consumerism are found to be the factors influencing rural households for dependence on moneylenders.

Keywords: Rural credit; Informal credit; Moneylenders; Rural households; Kerala.

Introduction

Rural credit system assumes importance in India because in most of the rural families their savings are inadequate to finance their economic activities. It is primarily on account of lack of income and lack of assets with the rural households (Thuruman, 2007). Small credits from exclusive Micro Finance Institutions, self-help groups, commercial banks, cooperative banks and Non-banking Financial Institutions are the major sources of formal credit for the rural households (Wu, Si, & Wu, 2016; Deshpande & Prabhu, 2005; Adikari, 2014; Akoijam, 2013; Bhavani & Bhanumurthy, 2012). However, the increasing dependence of the rural households on informal moneylenders for their credit needs are alarming (Household Finance Committee,

2017; Lainez, 2014; Basu, 2005; Deshpande & Prabhu, 2005; Okurut, Schoombee, & Berg, 2005; Pham & Lensink, 2007; Gupta & Chaudhuri, 1997; Tanaka & Molnar, 2008; Buckley, 1997; Guérin, Roesch, Venkatasubramanian, & D'espallier, 2011; Madestam, 2014; Ayyagari, Demirgüç-Kunt, & Maksimovic, 2010; Aliber, 2002). Though the formal credit sources have proven their potential to serve the poor households, provision of adequate credit on time was always been a challenge for the formal sources of credit (Tanaka & Molnar, 2008; Wu, Si, & Wu, 2016; Schrader, 1997; Pradhan, 2013; Timberg & Aiyar, 1984; Basu, 2005). The informal sources of credit include occasional lending (funds from friends and relatives), regular lending (moneylender transactions), inter-linked credit (continued relationship between the lender and the borrower), collective agreement (ROSCAs, credit unions) and corporate level financiers (finance corporations). It is quite evident that the informal credits are penetrating into the normal life of rural households in an unprecedented manner (Household Finance Committee, 2017; Lainez, 2014; Basu, 2005; Deshpande & Prabhu, 2005; Okurut, Schoombee, & Berg, 2005; Pham & Lensink, 2007; Gupta & Chaudhuri, 1997; Tanaka & Molnar, 2008; Buckley, 1997; Guérin, Roesch, Venkatasubramanian, & D'espallier, 2011; Madestam, 2014; Ayyagari, Demirgüç-Kunt, & Maksimovic, 2010; Aliber,

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2002). There are several factors which influence rural households to borrow money from informal lenders at a rate unusually higher than the normal rate (Berensmann, et al., 2002; Kislal, Menkhoff, & Neuberger, 2017; Dasgupta, 1989; Ayyagari, Demirgüç-Kunt, & Maksimovic, 2010; Sharma & Chamala, 2003; Jeromi, 2007; Pham & Lensink, 2007; Soyibo, 1997; Adikari, 2014; Mohieldin & Wright, 2000; Caskey, 1991; Chan, 2001; Tanaka & Molnar, 2008; Timberg & Aiyar, 1984; Schrader, 1997). The antecedent factors may differ from country to country and from region to region. The current study makes a pragmatic effort to identify the antecedents of dependence on informal credit among the rural households in Kerala.

Review of Literature

There are a lot of studies confirming the fact that most of the people uses a combination of formal credit and informal credit for their financial needs (Adikari, 2014). Informal credit has become a necessity as households are reluctant to tap formal credit as it involves rigid procedures, lengthy sanctioning time, stringent requirements of collateral and heavy documentation (Tanaka & Molnar, 2008; Wu, Si, & Wu, 2016; Schrader, 1997; Pradhan, 2013; Timberg & Aiyar, 1984; Basu, 2005). Guérin, Roesch, Venkatasubramanian, & D'espallier (2011) conducted a study to assess the magnitude of credit borrowed from various sources and its utilisation to various purposes. They found that the households are rational about the utilisation of fund availed from different sources of credit and so both the informal and formal credit will persist and expand in future. Mohieldin & Wright (2000) in their study found that most of the poorer households depend on informal financial sector for their needs. Poor households once rejected by formal financial sector turn towards informal lenders. It is also noted that formal financial sector serves the richer households as their collateral requirements can only be met by them. Times of India (2016) reports that households prefer moneylenders over banks as the requirements for granting a loan is cumbersome in the case of the latter. Time being a constraint, the high interest rate charged by the moneylenders are most of the times ignored by the households. Inability of banks to cater to the needs of poor and lack of easiness in doing business with formal institutions forces poor households to rely on informal lenders. They cater to the needs of households, but on default of payment of credit obligations, the borrowers' life are haunted by them. Even studies have found that the magnitude of the collateral requirement by

informal lenders are forty per cent lower than the formal lenders requirement that really paves the way for informal financiers to operate (Basu, 2005; Mohieldin & Wright, 2000; Adikari, 2014; Pradhan, 2013; Timberg & Aiyar, 1984).

The influencing factors for informal credit reported by studies are to a larger extent location specific factors though the lower income and assets are the primary causes (Household Finance Committee, 2017; Buckley, 1997; Okurut, Schoombee, & Berg, 2005; Mohieldin & Wright, 2000; World Development Report, 2000). Informal sources of finance are preferred even due to personal relations and family ties, and easy access to borrowing. Bhavani & Bhanumurthy (2012) in their study reveals that the Kerala households having loans from formal sources has decreased by 10% and from informal sources has increased by 9%. Factors such as suitability, convenience, timeliness, adequacy and informal nature of moneylenders are found by Jeromi (2007). Above all, unserved households by formal financial sectors find the moneylenders as the only hope (Biswas, 2018).

Research Problem

The unemployment rate is higher in Kerala (12.5%) third among the states in India and youth unemployment marked a high of 29 percent (Ravi, 2019). Financial distress is crucial among rural households and they struggle to meet the daily expenditure. Demand for credit is rising day by day with increasing price in commodities also (Jeromi, 2007). To meet their needs, the rural households borrow either from formal channels like commercial banks, regional rural banks, cooperative societies or through informal channels like moneylenders, friends and family, landlords, traders, and so on. Due to various reasons, the needy households are left unserved or underserved by the formal lenders (Okurut, Schoombee, & Berg, 2005; Mohieldin & Wright, 2000). There are several factors which influence rural households to borrow money from informal sources of credit. There are even evidences for borrowing money from moneylenders to repay formal credit obligations from bank, co-operative banks and other micro finance institutions (Mallick, 2012; Jain & Mansuri, 2003). Though a large number of studies have been done on informal sources of credit and its negative impact on borrowers. A comprehensive study focusing the antecedents of dependence on informal credit by rural households in Kerala is almost missing. Thus the investigation on the antecedents of dependence on informal credit in Kerala is the research problem.

Objective, Materials and Methods

The study intends to identify the factor structure of the antecedents of dependence on informal credit by rural households in Kerala. A sample of 960 rural households were selected from six districts out of the 14 districts across Kerala using a multi-stage sampling method. A structured interview schedule was used for collecting the data. The views of rural households on the abstract variables relating to the antecedents of dependence on informal credit were recorded on a five- point Likert-type scale wherein '5' denotes 'strongly agree', '4' denotes 'agree', '3' denotes 'neutral', '2' denotes 'disagree', '1' denotes 'strongly disagree'. An Exploratory Factor Analysis (EFA) is done on the 21 statements which could reflect the possible antecedents of dependence on informal credit by rural households so as to identify the factor structure. The statistical package for social science (SPSS 23) is used for analysis of the data.

Results and Discussion

The results obtained from the EFA on the 21 statements of dependence on informal credit and discussions on it follow. A brief profile of the rural households precedes the results and discussions.

Profile of the sample

Majority of the main income earners of the rural households (94%) belong to the age between 31 years and 60 years. On the whole 91.35 per cent of the breadwinners of the family are male members and 89.06 per cent of them are married. Among the households, 40.73 per cent are daily workers, 18.44 per cent are self-employed, 18.33 per cent are private employees, five per cent work in the government sector, meager three per cent are farmers and two per cent are professionals, and about ten per cent are jobless. Regarding the ownership of house, 89.06 per cent of households, lives in self-owned houses and 10.63 per cent in rented houses and mere 0.31 per cent in leased houses. Regarding the family size, about 87 percent of the households have up to six members in their family; 12 per cent have seven-nine members and less than two per cent have members above ten in their family. About 48 per cent of households earns annual income up to Rs.2 lakh, 47 per cent belongs to a band of Rs.2- Rs.4 lakh and mere five per cent earns above 4 lakh (Table 1).

Exploratory Factor Analysis (EFA)

The responses on the 21 statements on the antecedents of dependence on informal credit

Table 1: Profile of the Sample Rural Households

S. No.	Profile		Frequency	Percentage
1.	District	Kottayam	160	16.67
		Kollam	160	16.67
		Ernakulam	160	16.67
		Thrissur	160	16.67
		Mallappuram	160	16.67
		Kozhikode	160	16.67
		Total	960	100.00
2.	Gender of main income earner	Male	877	91.35
		Female	83	8.65
		Total	960	100.00
3.	Age of the main income earner	19-30	49	5.10
		31-50	673	70.10
		51-60	233	24.27
		61 & Above	5	0.52
		Total	960	100.00
4.	Marital Status	Single	55	5.73
		Married	855	89.06
		Widow/Widower	42	4.38
		Divorcee	4	0.42
		Seperated	2	0.21
		Total	960	100.00

(Contd.)

S. No.	Profile		Frequency	Percentage
5.	Job Status of Head of the Family	Jobless	70	7.29
		Daily Worker	391	40.73
		Govt. Servant	49	5.10
		Private Sector	174	18.13
		Self-employed	177	18.44
		Farmer	31	3.23
		Profession	15	1.56
		Homemaker	30	3.13
		Other	23	2.40
		Total	960	100.00
6.	Ownership of house	Self-owned	855	89.06
		Rented	102	10.63
		Leased	3	0.31
		Total	960	100.00
8.	Number of Family Members	1-3	142	14.79
		4-6	691	71.98
		7-9	115	11.98
		10 & Above	12	1.25
		Total	960	100.00
9.	Annual income of the household	Below 1,00,000	14	1.46
		1,00,001-2,00,000	445	46.35
		2,00,001-4,00,000	453	47.19
		4,00,001-6,00,000	36	3.75
		6,00,001--8,50,000	12	1.25
		Total	960	100.00

Source: Author's Data

Table 2: Antecedents for dependence on informal sources of credit- 21 statements

Sl. No	Antecedents
1.	There are less cumbersome initial formalities for informal credit
2.	Proximity to informal lenders led to availing credit from them
3.	Informal lenders charge less processing fees
4.	Little or no collateral requirements for informal credit
5.	There is speedy disbursement of loan from informal lenders
6.	Informal lenders allow flexibility in repayment of credit
7.	Informal lenders won't ask the purpose of borrowing
8.	We have difficulty in accessing available formal finance
9.	Unavailability of collateral to avail credit from formal sector
10.	Cumbersome formalities with formal sector led to informal credit
11.	Formal lenders requires long period to sanction a loan
12.	Insufficient sanctions by formal lenders led to informal credit
13.	Low family income forces us to rely on informal lenders
14.	Accidents/Death of family member led to informal credit
15.	Sufferings from long- term illness or disability led to informal credit
16.	Poor money management by the family led to informal credit
17.	Our tendency to imitate others led to informal credit availing
18.	Our excessive attraction to some products led to informal credit
19.	Alcoholism and other addictions of family members leads to credit
20.	Lack of influence with formal sector officials led to informal credit
21.	Bribing requirements with formal sector led to informal credit

Table 3: Antecedents for dependence on informal sources of credit-dimension reduction with EFA model fit

No. of variables	Kaizer- Meyer- Oklin measure of sampling adequacy	Barlett's test of sphericity chi-square	df	Sig.
21	0.759	9084.512	210	0.000

Table 4: Antecedents for dependence on informal sources of credit-factor classification based on PCA

Name of factor	Antecedent variables	Factor loading
Quick access to informal credit (QAIC)	Proximity to Informal sources of credit	0.600
	Less cumbersome Initial Formalities	0.716
	Little or no collateral requirements	0.698
Poor access to formal credit (PAFC)	Difficulty in accessing available formal finance	0.701
	Unavailability of collateral	0.591
	Cumbersome formalities	0.691
	Lengthy sanctioning time	0.554
	Insufficient sanctions	0.503
Consumerism (CON)	Poor money management	0.660
	Tendency to imitate others	0.656
	Excessive attraction to some products	0.617

is given in Table 2. Using Principal Component Analysis (PCA) by Varimax rotation method, the data are reduced into correlated factors. The communalities matrix in PCA revealed that only 11 antecedent variables out of the 21 variables

have a significant factor loading of 0.5 and above. The Kaizer- Meyer- Oklin Measure of Sampling Adequacy was 0.759, exceeding the recommended value of 0.6 and the Barlett's Test of Sphericity chi-square 9084.512 reached statistical significance,

Table 5: Reliability test

Construct	No. of items	Cronbach's alpha	Composite reliability
Quick access to informal credit	3	0.864	0.888
Poor access to formal credit	5	0.839	0.839
Consumerism	3	0.883	0.893

supporting the factorability of the correlation matrix (Table 3). The classification of variables based on the factor loading for the variables of antecedents for dependence on informal sources of credit is listed in Table 4.

Reliability Test

The Cronbach's coefficient of the three constructs ranges from 0.839 and 0.883, and it is considered acceptable (Hair et al., 2010). The composite reliability which indicates internal consistency of the latent variables ranges from 0.83 to 0.89 which is well above the suggested threshold of 0.70 (Fornell and Larcker, 1981) (Table 5). These numbers are considered adequate for confirming a statistically satisfactory level of reliability. The confirmed factor structures are explained below.

Factor 1: Quick Access to Informal Credit

The increased proximity to informal lenders, less initial formalities to obtain credit and lesser

collateral requirement by informal lenders are providing quick access for rural households to informal credit. In other words, these distinct features of informal sources of credit induces rural households to depend more on them.

Factor 2: Poor Access to Formal Credit

Difficulty in accessing available formal credit, cumbersome formalities, stringent collateral requirements, lengthy sanctioning time and insufficient sanctions restrain rural households from accessing formal credit. Poor access to formal credit lead rural households to depend on informal sources of credit.

Factor 3: Consumerism

The tendency of rural households to imitate others, their excessive attraction to some products and poor money management has increased the consumerism among them. These leads to dependence on informal sources of credit.

Conclusion

The study was focused on the identification of the factor structure of antecedents of dependence on informal credit by rural households in Kerala. Though Kerala is the most literate state in India, is not free from the clutches of the informal moneylenders. They do depend on the informal moneylenders on account of their poor access to formal credit accompanied by easy access to informal credit and the ever increasing consumerism among them. These dependence can cause significant economic erosion among the rural households which may ultimately result in a permanent debt trap.

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Proclaiming Growth and Development: Visualizing Bhutan from the Perspectives of GNH and ICTs

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Abstract

Bhutan is a tiny monarchy lying in the lap of gigantic Himalaya, and striving hard to graduate from the list of LDCs by 2023. The progress of any nation depends on the level of educational development, and ICT is a powerful tool to improve it. The developmental goals of Bhutan revolve around the unique concept of 'Gross National Happiness' (GNH), rather GNH is Bhutan's compressive development doctrine. The GNH has been associated with various aspects of Bhutan; whether it is economic, social or cultural. To go further on the path of development Bhutan has set long term goals for the nation to become a "knowledge-based society" with ICTs as the major platform. This paper aims to understand and examine the co-relation between GNH, ICTs, and development paradigms of Bhutan. Secondly, whether ICT can be helpful in achieving the developmental goals of the nation is the question that this paper will try to address with reference to Bhutan. Thirdly, will try to know how Bhutan has been successful in striking the balance between development, environmental conservation, and spirituality; as Bhutan is suppose to present a notable example.

Keyword: Bhutan; ICT; GNH; Education; Development; Ecotourism; Paradigm.

Introduction

Bhutan a democratic Empire in lofty Himalaya, where images of magical grandeur hide their challenges, provide an approach to understanding the conflicts that developing economies face when they move towards collective learning. Till 20 years ago, this Himalayan nation was completely isolated

from the world if observed in the light of global exchanges going on the fast face. Different in every sense of the word from the outside world, with the exception of the mythology that surrounds it, Bhutan tries to shift from the agrarian social framework, as it did in the 1800s to the feudal reign. In the techno-lover affair of the 21st century, it is observed that "the demand for such a transition requires teachers and politicians at all levels to rethink the role of schooling and what it means to be educated in this country at this level. To provide guidance, the government set up a special task force, the Royal Council on Education, to develop a curriculum and pedagogy that would require young people to develop those skills without sacrificing their past" (Gordon, 2013). The challenges are faced by educators who work in difficult situations with minimal support. Later on, Corbett, Venendal and Ugel (2017) argued that in the modern era of monarchical legal orders and representative institutions, monarchical governance will be

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eroded. Yet, persistent waves of democratization have accumulated their worldwide authority, some emperors particularly of small states are devoid of. Based on extensive “historical research” conducted in small states that have desired “to reconcile democratic governance and monarchy” - it is argued that, unlike Huntington, the emperors of small states were dedicated not likely to disappear; “overwhelmed by the dilemma posed by modernist development”, in the context of Bhutan.

Child Care, Education and Progressive Changes

The societal developments and changes could be untouched till late in the Himalayan kingdom due to resistance towards the major changes taking place at global level. The infusion of information and technologies has been late yet the Bhutanese societies and governance have taken it strongly. Though ICTs have not been entirely imbibed in the education sector but the waves of changes from the neighboring countries and at global level have been influential to motivate the nation. While till the 1960s, there was no education roadmap or school scenario, yet the current situation shows the inclusion of English language since elementary level in education leading³ it towards the preparedness for ICTs among kids and youth. The evolution of the school assessment in Bhutan, as a context for examining current and future school assessment problems, particularly in terms of quality and education improvement in Bhutan. The national education evaluation program in Bhutan, inspired by an initiative launched in South Asia in 2002 and financed by the World Bank, is a reference point for Bhutan. The development of NEA in year the 2003 has been instrumental in understanding the information methods. Various technical issues such as methods and need to administer the comparative NEA in the year 2010 have been able to invite concern of the review panel of Bhutan (Maxwell, Rinchen and Cooksey, 2010). At the level of the system at different levels of interest to achieve improvements, the research should be of “interest to educational systems in developing countries that have undertaken or intend to establish national programs for the evaluation of education”.

Lately, few authors (Pisani; et al. 2017) examined and demonstrated that early childhood development and protection services are constantly expanding and have structures at “the community, national and international levels.” However, many “low- and middle-income countries still have very limited DPCDE coverage, and there are

no comprehensive guidelines on good practice for effective primary education development”. Around the middle of this decade, during 2015, Bhutan achieved an effort towards the national assessment of existing DPCA programs to engage the evidence route with this process. With the help of “International Assessment of Early Development and Early Learning” program, the nation could evaluate and understand the effect of the same program on learning, growth and development. The results showed that children with access to the center’s programs gain more capacity than children who do not have access to these programs. There have been few factors in this context, related to the child benefits such as the higher quality centers, with fewer children. These factors also include family wealth, nurturing environments, positive home care, and learning methods. While moving towards higher education which is always related to the speedy growth and progress of a nation, Maxwell (2019) examined to show that “higher education in Bhutan in 2003 has irrevocably changed with the amalgam of unequal colleges to form the country’s first university”. The university and college system caters to the youth and guiding towards the higher education, careers, and nation building prospects. The research activities and outputs are directly related to the intellectual growth converting into economic growth. The observations from Maxwell’s study reflect that during the last two decades, the research doctorate degrees were obtained from outside Bhutan. The diverse nature of higher education and research included various aspects such as considerable professional benefits, tutoring, and researches on leadership roles.

Cultural heritage and Happiness Economics

Sonnenberg and Lham argue that the concept of researching gross national happiness (GNH) - or the idea that a country’s development strategy should aim to maximize the happiness of a people rather than maximizing its economic output - is attractive by its humanist simplicity. When drafting the concept for the first time in 1979, Bhutan’s 4th Druk Gyalpo told the world that “Bhutan’s integration into the global community” should not be rewarded by blindly accepting the standard definitions of the development of progress. The ability to define “success, and focus on economic growth and environmental preservation, the preservation of culture and communities, and good governance” are few of the aspects that may vary from a country to another one. In retrospect, Bhutan’s insistence on

GNH has been on legislators, legal academicians and development partners in Bhutan.

Economic, religious and community norms are associated with environmental values in many villages of three major communities in Bhutan. Using a multi-level logistic regression, Brooks (2011) analyzes four questions related to environmental values, and concludes that not economic rather religious factors are better indicators of environmental values, thus supporting the “conservation and development” approach. Besides, traditional community norms have little relation to environmental values. However, a national environmental standard may emerge as a result of government efforts and based on Buddhist principles. Although the economic reasons and objectives are significant, Bhutan’s approach to development suggests that commitment to the environment; expressed religiously, may also affect environmental values. Suntikul and Dorji (2016) understand that the “Himalayan nation of Bhutan” has been known for adopting gross national happiness. It has been used as a check and measurement for gross national product where the “happiness, spirituality and cultural authenticity” are significant causes in the tourist image of Bhutan. The various characteristics of the GNH have been reflected in the society as traditional festivals, which intrigue and attract many foreign tourists. The ethnic aspects and cultural practices of various celebrations and festivals in Bhutan expresses the relations and effects of tourism. The survey of monks and Bhutanese laity about the effects of tourists on festivals; the “Tsechu Festival connected with the aim to increase the number of annual tourists more than four times to 200,000 by 2018”. In this perspective, the Government of Bhutan has been proactive and it provides some glimpses of “perceived impact of tourism” on religious and cultural festivals of Bhutanese people.

Attacking cultural stability issues by examining traditional festivals in Bhutan, Suntikul (2018) attempted to identify a “cultural gap” in the sustainable tourism literature. It is considered “Cultural tourism is the main driver of tourism in Bhutan and religious festivals are among the main contexts in which locals and tourists interact. Tourism puts the forces of modernization and globalization in contact with traditional practices with various consequences.” Mainly based on on-site visits and observations of religious activities, community involvements, festivals and specific interviews with monks and monasteries of Bhutan, the modernization events are disguised in the

traditions of religious festivals. Baumann’s idea related to “fluid modernism” is applied to clarify the difference between “traditional and modern practices and to express the frame of reference in a constantly changing way”. This leads to a significant discussion of the fact that the case of festivals in Bhutan reveals the need to see “cultural stability in fluid and evolving terms”, especially in the “modern liquid” era. The tourists and young people from the region are recognized as special agents of fluid modernity in festivals, bringing attitudes and behaviors different from those of traditional yet contemporary Bhutanese society. Understanding the relations of climate, economics and cultural roles, Yangka, Rauland and Newman (2019) researched on climate policy around the world, which evolves at a very variable rate. Some places are very committed to decarbonising their economies and others are just beginning. However, Bhutan is one of the few states committed to achieving carbon neutrality as the country reconciles its aim to develop “economic opportunities (GDP) and human happiness (GNH)”. The policies and processes should be in tandem with the idea of how Bhutan will maintain carbon neutrality. The recent developments conform to the history of Bhutan and its utility for policy framing, and the exchange of information, particularly in the context of climate governance in emerging countries.

Development through Embracing Changes

The rich heritage and strong convictions towards the growth based on preservation of climate, sustainable development, and use of information, have compelled Bhutan to look outside the framework which has been the guiding force of national progress. Chaudhary et. al. (2017) analyzed the fact that Bhutan is at the forefront as a contributor to global conservation goals. The implementation of a systematic research framework for considering that quantitative, qualitative and geospatial tools were tested. It has been observed that a large number of the local population is still directly dependent on the various ecosystems for services. An integrated and holistic approach, focusing on both conservation and community development, should be used to manage and develop the valley and the region in a sustainable manner. This is revealed that limited livelihood strategies reduced the pressure on the forest and marsh. Proper land-use planning in the valley would be beneficial for maintaining and regulating land uses effectively and avoiding potential

conflicts between colonization, agriculture, forest, and swamps.

A long-separated Buddhist nation in the Himalayas, Bhutan paved the way for "internal modernity and global integration", using the teachings of "gross national happiness"; and the preservation of "culture, environment, economic equity and sustainability, and clean and transparent governance". Various challenges are there which include the degree of desirability according to the principle "one nation, one people". Youth in the country struggle with an education that is "often unsuitable for job prospects, urban migration, social temptations and declining traditions". The choice of "appropriate cultural elements for preservation, modification, or replacement" includes basic components of "spiritual continuity" to facilitate the path of development (Walcott, 2011).

The major concerns in the recent past are conserving forests and urban development. The contemporary times have witnessed the altered mechanisms for modernity yet at slow-paced and highly fixed in nature. According to Yeshey; Shrestha; Schmidt-Vogt and Qasim (2018), the cultivable lands of Bhutan, are seriously threatened by land degradation. To control soil erosion problems, an appropriate approach to soil management was considered significant. The attempts "to characterize and document conventional and community land management approaches applied in Chukha and Dagana districts, respectively. The endeavors applied to benchmark its "social, economic and environmental impacts" on participating farmers. This type of approach had a considerable impact on the level and intensity of farmers' participation in the program, the implementation of "soil erosion control measures (SECM)" and the social, economic and environmental impacts. The comparisons between "community-based approach" and "conventional approach" reflect the status and popularity of these approaches among people. Various attributes of the community approach are expressing the reasons for usage among the respondents. The traditional approach has been left behind though it tried to charm the people with the innovative aspects. Thus, the community-based approach had a higher potential than the conventional approach "to meet the diverse requirements of rural subsistence farming communities in Bhutan". The recent inclination towards the ICTs has been associated with the GNH [3] in Bhutan.

Ecotourism and Bhutan

The role of information is spanned beyond the usual course of monarchy and democratic government for sustainable development. Since, tourism is gravely woven in Bhutan's cultural and economic growth; the ICTs play an instrumental part in facilitating the steps, scope, and sophistications of modern governance, growth and "gravitational" factor to people, in general. Montes and Kafley (2019) believe that the traits and characteristics of ecotourism function as a boon for futuristic growth. Bhutan, "a small kingdom of the Himalayas", has been a strong example of marketing and promoting ecotourism. This focus has been framed due to the infused concept of Gross National Happiness (GNH). This may be considered and as a "philosophy of local development derived from Buddhist ethics and Bhutanese values". The understanding of the "ecotourism" societies has "ethnographic evidence" of diversity and prosperity among man, society and the environment. Such diversity and prosperity are generating the divergences, which are "representative of an underlying neoliberal logic and discourse that drives the ecotourism sector".

Bhutan and Recent ICT Roadmaps

The technology could not pave its way in Bhutan till late. Almost three decades ago, the country had the advent of first-ever television broadcast in 1999 and though the license for the television station was granted during 1980s [3]. The arrival of this basic one-way mass communication medium opened the doors for the later information communications technology (ICT) advancements. It is nearly a surprise that the mobile subscriptions began early in 2003 where the entire world was enveloped in mobile communications networks. During the year 2015, there has been tremendous growth in the mobile subscriptions as 87 per 100 persons and internet use [1] by 40%. Current times have observed the networking of fiber optic cables in major districts. These developments are distinguishing factors to reflect the growth of ICTs in Bhutan.

During 2015 Bhutan brought upon an ICT policy and roadmap [1] intending to consider the goals which included aims to have ICT Infrastructure with the citizen and business (central and participative)

approach to have investment-friendly environment. The ICT roadmap contributed towards the facilitation of ease of access to information while creating a transparent and accountable ICT lifestyle. These goals are to create learning and responsible society to have an active role in preserving and promoting culture. According to, the "World Bank's 2016 World Development Report" related to "Digital Dividends" has been able to assert the role of ICTs in opportunities and service deliveries. The growth in ICTs, mechanisms, and implementations became instrumental in the contexts of reducing the economic isolation by factors such as the removals of trade barriers, improving mobility and tourism. The Bhutan ICT Roadmap and Bhutan E-Government Master plan along with The Government to Citizen (G2C) program are providing glimpses of ICTs inclusion and governance and citizens' advantages. In these perspectives, the national ePayment Gateway Infrastructure was established by the Royal Monetary Authority (RMA). RMA is the central bank that made efforts to augment the online payments for services. The further developments in this direction are in the form of "eCitizen Portal" [2]. This portal is an outcome of the endeavors of the National Land Commission (NLC) for solving the problems of urban development. This portal is facilitating the transfer of property titles online. This attempt of NLC is involving the private sector for feedback as well as improvement in the service. Few other ICT related attempts and establishments are including electronic government procurement system (e-GP) [4], Thimphu Tech Park [5], and an initiative in the form of ICT College (Ishihara, 2017) in 2017. These endeavors have enhanced the provisions of affordable internet connectivity and minimizing the digital divide while placing it 117th rank among 175 countries in the 2016 ICT development index. The ICT policies of Bhutan have been emphasizing on the use of Google Apps, strengthening the e-Government Interoperability Framework and bringing various projects through e-Governance.

Conclusion

'Gross National Happiness' has been the cardinal principals of Bhutan's growth and development philosophy. And, ICT has been an important tool of GNH, another model of growth and development that the Kingdom has followed over the last twenty years. The alternative model of growth and development places comprehensive

prosperity and human happiness at the heart of the growth equation. In the contemporary world order, no country can refrain from the external world. Despite of geographical, historical, and cultural limitations Bhutan was bound to expose to the outside world. Being a resource-starved nation it requires external assistance. So the major problem of Bhutanese development policy is that it can't allow uncontrolled and limitless cooperation; as Bhutan has given more priority to people's happiness over material well being. Further, the preservation of culture and the environment is also an important issue. This also entails the formularization of development policy in such a way so that external exposure does not pollute its long-established cultural fabric and the environment. The aristocracy of Bhutan has to be vigilant about the limitations put down by the 'Gross National Happiness' while implementing the ICTs operations. Hence, a balanced ICT approach is needed to achieve the goals of GNH.

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Standard journal article

[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. *J Oral Pathol Med* 2006; 35: 540–7.

[2] Twetman S, Axelsson S, Dahlgren H, Holm AK, Källestål C, Lagerlöf F, et al. Caries-preventive effect of fluoride toothpaste: A systematic review. *Acta Odontol Scand* 2003; 61: 347–55.

Article in supplement or special issue

[3] Fleischer W, Reimer K. Povidone-iodine antisepsis. State of the art. *Dermatology* 1997; 195 Suppl 2: 3–9.

Corporate (collective) author

[4] American Academy of Periodontology. Sonic and ultrasonic scalers in periodontics. *J Periodontol* 2000; 71: 1792–801.

Unpublished article

[5] Garoushi S, Lassila LV, Tezvergil A, Vallittu PK. Static and fatigue compression test for particulate filler composite resin with fiber-reinforced composite substructure. *Dent Mater* 2006.

Personal author(s)

[6] Hosmer D, Lemeshow S. Applied logistic regression, 2nd edn. New York: Wiley-Interscience; 2000.

Chapter in book

[7] Nauntofte B, Tenovou J, Lagerlöf F. Secretion and composition of saliva. In: Fejerskov O,

Kidd EAM, editors. Dental caries: The disease and its clinical management. Oxford: Blackwell Munksgaard; 2003. pp 7–27.

No author given

[8] World Health Organization. Oral health surveys - basic methods, 4th edn. Geneva: World Health Organization; 1997.

Reference from electronic media

[9] National Statistics Online – Trends in suicide by method in England and Wales, 1979–2001. www.statistics.gov.uk/downloads/theme_health/HSQ20.pdf (accessed Jan 24, 2005): 7–18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

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