

# Convergence in Food Diversity and Calorie Intake among two Regional Economic models of India

Dr. R. Santhosh.\* & D. Legio Meril \*\*

\*Assistant Professor, Department of Economics, University College, Thiruvananthapuram, Kerala, India.

\*\* Assistant Professor, Department of Economics, St. Xavier's College, Thiruvananthapuram, Kerala, India .

Received: February 05, 2019

Accepted: March 13, 2019

**ABSTRACT:** *With the opening up of the economy, India has achieved a remarkable growth in the per capita income as well in the Monthly Per capita Consumption Expenditure (MPCE) on food. Along with an increase in MPCE on food an increase in Food Diversity (FD) and calorie intake is being expected. The study probe into the changes and convergence in FD and calorie intake among the rural people of two economic models, Kerala and West Bengal (WB) in the post liberalized era. With respect to FD Rural WB was lagged behind Kerala in both the period. Even then the poor income strata of both the States have improved their FD. Both the State has registered a remarkable growth in the intake of calorie during the period but the pace of growth is much faster in Kerala. Interestingly, the middle and the rich income group of Kerala surpassed the WB in the intake of calorie during the period.*

**Key Words:** : *Diet pattern, Food diversity, Inequality, Rural Food consumption*

## 1. Introduction

Diet pattern varies across time and space with inbuilt inter-personal, age induced and gender wise disparity. There are many factors to induce and shape the diet pattern of a society. Diet pattern across the world shows that as income increases people tend to maximize their intake of nutrients by spending more on easily available staples. As people get richer and when they get a chance to spend more on food, they do not place the whole lot into one type of food for getting more calories from the same staples. On the other, they prefer to a diversified diet for better tasting and more expensive calories (Banerjee & Duflo, 2011). To have diverse food is an internationally recommended protocol for a healthy diet (Kennedy and Guy, 2009). Empirical evidence exhibits that diverse diets are also accompanied by positive health outcomes (Rashid, Lisa & Tauhidur, 2006). Studies on Food Diversity (FD) also reveal that diet quality improves with FD since no single food can contain all the nutrients. It is a fact that diet diversification is essential for our bodily functions as well as for our physical and cognitive health.

A perusal of Consumer Expenditure Survey data of National Sample Survey Organisation (NSS) for the period 1993–94 to 2011–12 exhibits a noticeable divide in the expenditure on food, diet pattern and its diversity among various States of India (GOI, 1996, 2014). In the post liberalized regime, the Monthly Per capita Consumption Expenditure (MPCE) on food and non-food items have registered an impressive growth both in absolute and real terms across different income strata of almost all states of the Union of India (Baiju, 2002, Santhosh, 2013). In the literature on diet pattern, a fall in the proportion of expenditure on cereals and an instantaneous increase in the expenditure on other food items are indexed as an improvement in the diet quality. A perusal of NSS data shows that Kerala ranks top among the major States of India in the Rural MPCE on food in the post liberalized regime (Santhosh, 2013, 2018a) However, West Bengal (WB) was lag behind in the expenditure on food compared to many major States of the Union and especially with Kerala. Yet, WB has also achieved remarkable progress in the expenditure on food in the post liberalized regime. Against this backdrop, this paper attempts to examine whether there is any improvement and convergence in FD and calorie intake among two regional economic models of Kerala on the south and West Bengal in the north during the period 1993–94 to 2011–12.

## 2. Data Source and Methodology

This paper is based on secondary data only. The vital data source is the Consumer Expenditure Survey (CES) reports provided by the NSSO for two quinquennial rounds (NSS 50<sup>th</sup> (1993-94), and 68<sup>th</sup> (2011-12)). For an in-depth analysis and to portray the contrast and similarities in FD and calorie intake among different income strata, the technique of fractile analysis is used (As reported in NSS data). F1 and F2

are called bottom fractile (lowest 5 percent population each), F1 and F12 (top 5 percent population) is termed as top fractile. All other fractile consists of 10 Per cent of the population. The bottom 4 fractile were collectively termed as Bottom Groups or the lowest 30 per cent of the population, next four fractile were termed as Middle Group or the middle 40 per cent of the population. The top 4 fractile were termed as Top Group or the top 30 per cent of the population. For the sake simplicity, these groups were loosely called as the poor, middle and the rich respectively.

Food diversity is the average number of food items consumed by a household out of the total number of food items in a reference period of one month. In the study, food variety/FD is estimated by using Simpson Diversity Index (SDI). Simpson Diversity Index (SDI) =  $1 - \sum w^2_i$ , where  $\sum w^2_i$  is the sum of squares of the expenditure share or calorie share of food group 'i'. The SDI value ranges from zero to one. Higher the value of SDI, higher will be the FD and vice versa (Nguyen &Winters, 2011). Expenditure on food items in the study has been sub-divided into 14 broad groups. For the comparative study per capita Per Consumer Intake of Calorie (PCUI) is taken into consideration. Study period is 1993-94 to 2011-12. Only rural sector is considered for the study.

**3. Results and Discussion**

This section is subdivided into two parts. The first section analyses the inter-class and intra-class in FD among the different rural income strata of Kerala and WB during the study period. Second section is an attempt to analyze the disparity in calorie intake and changes over it.

**3.1 Trend in Food Diversity in Kerala and West Bengal**

FD is an index of diet quality as it shows the variety of different food items consumed (Jackson, 1984). FD shows the percentages allocation of expenditure on different food items and changes over it. For the estimation Simpson Diversity Index (SDI) is used. Estimated data shows that FD is comparatively less in WB in 1993-94 period in relation to Kerala (Table 1). The reason which can be attributed for a lower FD for WB during the period is highly skewed expenditure pattern in favour of cereals and less on other items. In the case of rural Kerala for the same period 1993-94, the FD for the bottom fractile is equal to or higher than the FD of the top fractile of WB. Kerala has got a higher inter-class and intra- class FD compared to the WB. The reason which can be attributed for a higher FD for the rural Kerala is its least skewed pattern of expenditure on cereals and a much dispersed expenditure on food other than cereals.

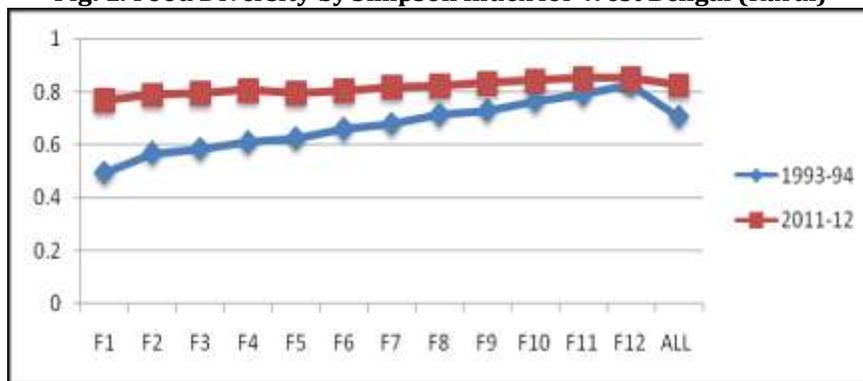
WB has registered a remarkable improvement in their FD during the period 2011-12 (Fig 1). In over all, FD has improved at a 12 point scale during the period for WB (Table 1). Significant improvement has been registered for the bottom groups during the period. A fall in the concentration of expenditure on cereals and an increase in the expenditure on food other than cereals can be attributed as a reason for a significant up in the FD. An intra-class convergence in FD is noticed during the period (Fig 1)

**Table.1: Food Diversity of Kerala and WB 1993-94- 2011-12(Rural)**

50 <sup>th</sup> Round (1993-94 )		68 <sup>th</sup> Round (2011-12)		
<b>SIMPSON DIVERSITY INDEX(SDI)</b>				
Fractile classes	WB	Kerala	WB	Kerala
(1)	(2)	(3)	(4)	(5)
F1	0.4953	0.8039	0.7689	0.8746
F2	0.5687	0.7711	0.7907	0.8730
F3	0.5852	0.7853	0.7957	0.8722
F4	0.6103	0.8011	0.8067	0.8724
F5	0.6250	0.8001	0.7961	0.8717
F6	0.6610	0.8085	0.8048	0.8705
F7	0.6803	0.8293	0.8190	0.8678
F8	0.7143	0.8288	0.8233	0.8726
F9	0.7307	0.8476	0.8343	0.8719
F10	0.7655	0.8554	0.8414	0.8649
F11	0.7911	0.8606	0.8498	0.8686
F12	0.8275	0.8686	0.8518	0.8452
ALL	0.7074	0.8514	0.8259	0.8696

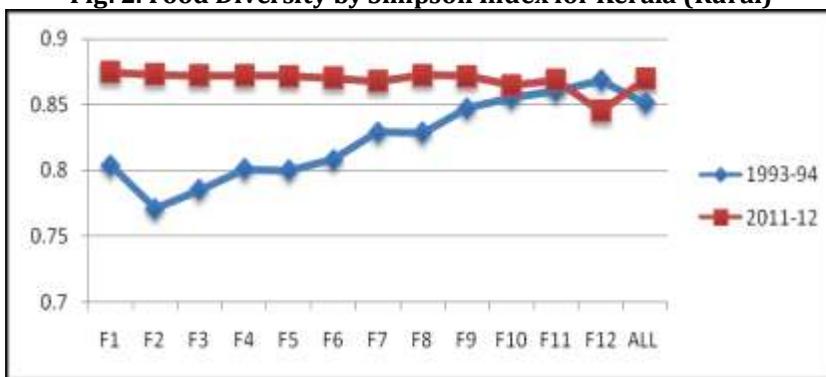
Source: Estimated from NSS data for 50<sup>th</sup> and 68<sup>th</sup> round

**Fig. 1. Food Diversity by Simpson Index for West Bengal (Rural)**



Source; Prepared from NSS data for 50<sup>th</sup> and 68<sup>th</sup> round

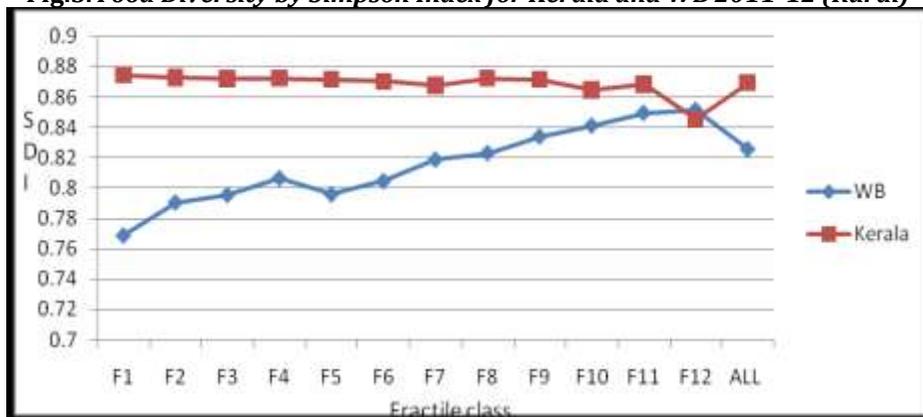
**Fig. 2. Food Diversity by Simpson Index for Kerala (Rural)**



Source; Prepared from NSS data for 50<sup>th</sup> and 68<sup>th</sup> round

It is fascinating to note that bottom fractile of Kerala has achieved a significant improvement in FD during the period (Fig 2). However, in the case of the top group there is stagnation and a significant fall in the FD for the top group during the period (Fig. 3). It is because of a shift in the concentration of expenditure from cereals to egg, fish, to meat and to processed food and beverages. It has impacted the FD of the top group. Even then Kerala is ahead of WB in rural FD. It is fascinating to note that FD of the WB is increasing where as it is stagnating or falling for the Kerala with an expected inter-class convergence in FD in near future.

**Fig.3. Food Diversity by Simpson Index for Kerala and WB 2011-12 (Rural)**



Source; Prepared from NSS data for 50<sup>th</sup> and 68<sup>th</sup> round

### 3.2. Trend in the Per capita Intake of Calorie

Any real increase in the expenditure on food and change in the allocation of expenditure on various broad groups of food items have their impact on the intake of calorie among different income strata. Over the years there has been an absolute as well as real increase in the expenditure on food for both the States. In addition

to that a shift away from cereals to other food groups also has made a dent on the intake of calories, as cereals are the cheapest and richest source of energy (Santhosh, 2018a). In the post- reform period the calorie intake of average Keralities has increased significantly (GOI, 1996, 2014). The poor income group has registered a significant growth during the period (Table 2). A much expected fall in the intake of calorie due to a shift away from cereals among the rural income strata of Kerala might have averted by a significant growth in the expenditure on food. There is a mismatch between the growth of MPCE on food and calorie intake of the rich. It is because of a diversification of diet among the rich in favour of food other than cereals. The poor income group has registered a visible growth in the intake of calorie because they have not yet reached a saturation level in the intake of cereals and are on the way. With respect to rural WB, the poor income group has registered a marginal increase in their intake of calorie. However, for the top group, there is a fall during the period. A shift away from cereals might have affected their intake of calorie. Yet, a diversification ensures a balanced diet and a fall in the excess intake of calorie during the period is to be considered as a positive health outcome. It is expected that rich income group might have a sedentary way of life and an average intake 4151 kcal per day leads to occurrence of life style diseases. During the period 1993-94, WB is ahead of Kerala in the intake of calorie across different income strata

**Table .2: Per capita Per Consumer Unit per Diem intake of Calorie by Fractile WB and Kerala (Rural)**

MPCE class as Fractile	NSS Rounds				Percentage growth (0.00percent) in the intake of calorie	
	50 <sup>th</sup> Round (1993-94)		68 <sup>th</sup> Round (2011-12)			
	Intake of calorie		Intake of calorie			
	In kcal		In kcal			
	WB	KERALA	WB	KERALA	WB	Kerala
(1)	(2)	(3)	(4)	(5)	(6)	(7)
F1	1720	1045	2076	1630	17.15	35.89
F2	1971	1371	2123	2021	7.16	32.16
F3	2119	1474	2248	2019	5.74	26.99
F4	2321	1671	2316	2159	-0.22	22.60
F5	2474	1818	2414	2268	-2.49	19.84
F6	2593	1983	2456	2393	-5.58	17.13
F7	2755	2056	2589	2453	-6.41	16.18
F8	2859	2197	2612	2678	-9.46	17.96
F9	3047	2416	2855	2772	-6.73	12.84
F10	3225	2712	2897	2998	-11.32	9.54
F11	3578	2943	2968	3438	-20.55	14.40
F12	4151	3468	3535	3770	-17.43	8.01
All	2733	2451	2576	2519	-6.09	2.70

Source: NSS reports for 50<sup>th</sup> and 68<sup>th</sup> round

That trend has changed in 2011-12 where the middle and the rich income group of Kerala are ahead of the WB. However, the poor income group of WB is ahead of Kerala even in the year 2011-12. It signals a trend of both inter-class and intra-class convergence in the intake of calorie among the different income strata of rural Kerala and WB.

**4. Conclusion**

Despite the fact that food is a basic requirement of all, there exist wide disparity in the expenditure on food, food diversity and calorie intake among different strata of people. With respect to FD Rural WB was lagged behind Kerala in both the period. It is because of the high concentration of expenditure on cereals among the rural people of WB. However, WB has registered a significant improvement in FD during the period with a significant reduction in the expenditure on cereals and an up in the allocation of expenditure on food other than cereals. In rural Kerala, overall trend is that there is a compositional shift in diet pattern that the proportion of expenditure on cereals falls and an increase in high value foods like gram pulses, vegetables,

meat egg and fish. Interesting fact is that expenditure on beverages which includes processed food ready to eat food and eating-out is increasing across all sections. It also implies the extent of diversification of diet in the rural food basket of Kerala during the study period. With respect to FD it is increasing with income and it has increased for all in the post liberalized era. FD of the poor has increased significantly and marginally for the middle. A striking thing is that FD has declined marginally for the rich since their expenditure is showing a trend of concentrating more towards non- alcoholic beverages and on egg fish and meat. Both the States have registered a growth in the intake of calorie during the period. However, Kerala has registered a significant growth. Interestingly, in both the periods rural poor of WB is ahead of Kerala in the intake of calorie. Yet there is a trend of convergence on it since rich and middle income group of Kerala have surpassed the WB in 2011-12 in the intake of calorie. Care should be taken by policy makers to ensure required intake of calorie among the poor income strata by strengthening the public distribution system since they are supposed to pursue physical and manual work. It is imperative to create awareness among the poor and middle income group about the importance of diversification and the futility of diversification without a baseline intake of calorie from cereals.

## 5. References

1. Abhijit V Banerjee, and Ester Duflo(2011). Poor economics; rethinking poverty and the ways to end it.Random House, India.
2. Kennedy,G Guy, N. and Prakash, S(2009).Globalisation Food System in Developing Countries: A Synthesis of Country Case Studies". Rome: FAO Food and Nutrition Paper 83.
3. Rashid, D Lisa, S.andTauhidur, R(2006).Determinants of Dietary Quality: Evidence from Bangladesh", Available :<http://purl.umn.edu/21326.2006> . [accessed 22- July-2012]
4. GOI.(1996,2014).Level and Pattern of Consumer Expenditure", New Delhi: NSSO, Govt. of India..
5. GOI(1996,2014). Nutritional intake in India"New Delhi: NSSO, Govt. of India,
6. Baiju, K. C (2002).Consumption Pattern and Economic Growth"Trivandrum: Unpublished Doctoral Thesis , University of Kerala, Trivandrum.
7. Santhosh.R.(2013). Influence of quality preference on urban food consumption pattern in Kerala", Un published Ph.D thesis, M.G University, Kottayam,
8. Santhosh, R (2018a). Food expenditure profile and North-South divide- An analysis", Indian Journal of Economics and Development.Vol.14 (3) pp.521-527.
9. Nguyen, M.C and Winters, P(2011).The Impact of Migration on Food Consumption Patterns: The Case of Vietnam". Food Policy Vol.36 issue .1, pp. 71-87.
10. Jackson.L(1984).Hierarchic demand and the Engel curve for Variety" The Review of Economics and Statistics Vol.66, pp. 8-15.