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Preparation and
Characterization of ZnSe/EVA
Nanocomposites for
Photovoltaic Modules

- Jose Sebastian, Eby Thomas

Thachil, Jobin Job MAthen,
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# Preparation and Characterization of ZnSe/EVA Nanocomposites for Photovoltaic Modules 

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#### Abstract

ZnSe Nanoparticles were synthesized by solvothermal method and the particle was characterized by Transmission Electron Microscopy. The polymer nanocomposite of $\mathbf{2 \%}$ and $4 \% \mathrm{ZnSe}$ /EVA was fabricated by direct sonicator method. The nanocomposites were characterized by UV-Vis-NIR and FT-IR spectroscopy. The thermal behaviour of the samples was also investigated and we found that the thermal stability of the composites increased with increasing the filler concentrations. The mechanical properties such as tensile strength, peel strength and refractive index of the samples were also studied and reported for the first.


## Keywords

EVA, ZnSe, TG-DTA, Refractive Index, Peel Strength, Tensile Strength

## 1. Introduction

Thermoplastics and thermosetting plastics have been found useful for various applications in the field of electronic and electrical technology. Fabrication of nanostructures in polymer matrices has attracted researchers due to the advantages of readily tunable bandgaps, electroactivity, excellent flexibility and good processability com-

[^0]pared with conventional materials [1]-[4]. The optical and electronic properties of the polymer matrices can be altered with judicious selection of nanomaterials [5] [6]. Polymer-semiconductor nanocomposites with non linear optical properties are used in fibre-optic communication systems such as optical storages, optical limiters and digital signal restoration [7]-[9].

Poly Ethylene-co-Vinyl Acetate (EVA) is a commercial plastic with good low temperature flexibility and toughness. EVA exhibits rubbery property of enhanced elongation along with ease of processability of thermoplastics. Due to its surface gloss and impact strength, EVA copolymers find market in film manufacturing. The presence of vinyl acetate molecules in the polymer chain reduces the polymer regularity and crystallinity. EVAclay nanocomposites are widely used in the manufacture of wires, cables and also in food packaging industry [10].

The II-VI semiconducting materials show significant properties from the optoelectronic point of view [11]. Among the polymer -inorganic nanocomposites, $\mathrm{SiO}_{2}, \mathrm{TiO}_{2}, \mathrm{ZnO}$ and clay based filler systems have been widely investigated [12] [13]. In the bulk form and in the quantum dot form, these materials exhibit high density and quantum confinement. Zinc Selenide ( ZnSe ) is a n-type semiconductor material with wide band gap (2.58-2.72 eV ) [14] [15]. The band gap was found to increase as the particle size decreased. The mechanical, electrical and thermal properties of EVA-ZnSe nanocomposites were not studied. The incorporation of semiconducting ZnSe nanoparticles to the amorphous EVA structure was found to alter the properties of the polymer films.

The present work mainly focused on the preparation of nanocomposite film based on EVA with varying ratio of ZnSe particles and studied the effect of ZnSe on the electrical, thermal and mechanical properties of EVA.

## 2. Experimental

### 2.1. Synthesis of ZnSe/EVA Nanocomposites

The materials such as zinc acetate and sodium selenite used for the preparation of ZnSe nanopowder are Merck GR grade of purity $\geq 98 \%$ purity. Zinc acetate of 4.388 g was dissolved in 100 ml of direct Millipore water and 0.519 g of sodium selenite $\left(\mathrm{Na}_{2} \mathrm{SeO}_{3}\right)$ was dissolved in 30 ml of hydrazine hydrate $\left(\mathrm{N}_{2} \mathrm{H}_{4} \cdot \mathrm{H}_{2} \mathrm{O}\right)$. Both the prepared solutions were mixed up under vigourous stirring with external heat energy. Then these solutions were transferred into teflon lined sealed stainless steel autoclave and heated at $240^{\circ} \mathrm{C}$ for 5 hrs in a muffle furnace. It was washed two times using Millipore water for removing impurities. In essence, stringent symmetry of nanoparticles can be controlled by chemical concentration, reaction temperature and kinetic control.

Ethylene Vinyl Acetate (EVA), copolymer used for the experiment was obtained from Exxon Mobil Chemicals, Singapore. The vinyl acetate content of the copolymer used was $9.4 \mathrm{wt} \%$ (Density- $0.931 \mathrm{~g} / \mathrm{cm}^{3}$, Melt Flow Index- $2.1 \mathrm{~g} / 10 \mathrm{~min} @ 190^{\circ} \mathrm{C}, 2.16 \mathrm{~kg}$ ). The copolymer was first dissolved in toluene. Then synthesized ZnSe nanoparticles were dispersed in a sonication bath for 2 hours on the basis of the desired weight fraction ( $2 \%$ and $4 \%$ ) of ZnSe nanoparticle at room temperature. In order to make the resultant neat nanoparticles filled polymer samples, it was transfered to a teflon coated glass mould and spread with uniform thickness. Afterward, the mixture was heated at $40^{\circ} \mathrm{C}$ for 18 hours in an air oven to evaporate the solvent completely and finally, a thin film of pure and $\mathrm{ZnSe} / \mathrm{EVA}$ nanocomposites formed.

### 2.2. Characterization

ZnSe nanoparticles were analyzed using Hitachi H7500 TEM where the sample is irradiated with an electron beam of uniform current density with the electron energy of 100 keV . The Fourier transform infrared (FT-IR) spectra of the samples have been carried out in the wave number range $400-4000 \mathrm{~cm}^{-1}$ using a Thermo Nicolet Make Avatar 370 FTIR Spectrometer and for signal detection, DTGS detector is used. The refractive indices of the samples were determined using HIOKI 3532-50 LCR IMPEDANCE ANALYZER and program version 4.03E was used to record the refractive indices of the samples by varying the frequencies from 100 Hz to 5 MHz . VARIAN CARY 5000 spectrophotometer is used to determine the optical absorption spectrum of the samples and recorded in the region of 200 to 2000 nm . The TGA and DTA analyses of $\mathrm{ZnSe} / \mathrm{EVA}$ were carried out between 28 and $1300^{\circ} \mathrm{C}$ at a heating rate of $20 \mathrm{~K} / \mathrm{min}$ using the instrument NETSZCH STA 409C. The tensile properties of the virgin EVA and EVA nanocomposites were measured by an Instron 3366 universal testing machine according to ASTM D882. Peel strength was performed using an Instron tensile testing machine at a peel speed of $50 \mathrm{~mm} / \mathrm{min}$. Peel test with $180^{\circ}$ stripping was carried out as per ASTM D 1876 . Peel test involves
stripping away of substrate joined by the adhesive. The substrates (glass paper, cotton and polyester) were flexible enough to permit a $180^{\circ}$ turn near the point of loading. Peel strength values are recorded in Newton per millimeter ( $\mathrm{N} / \mathrm{mm}$ ) of width of the bonded specimen.

## 3. Results and Discussion

### 3.1. TEM Analysis

Transmission Electron Microscopy (TEM) is a vital characterization tool for directly imaging nanomaterials to obtain quantitative measures of grain size, size distribution, and morphology. TEM of ZnSe nanoparticles are shown in Figure 1. The image reveals that the shape of the particles is spherical and the average size of particles is about 80 nm . The dark images show that nanoparticles are solid in structure.

### 3.2. FT-IR Spectroscopy

The FTIR spectra of the $\mathrm{ZnSe} / E V A$ nanocomposites are shown in Figure 2. The comparison of pristine, 2\% and $4 \% \mathrm{ZnSe}$ has been compared and the polymetric group identification with the effect of ZnSe in EVA could be established. The peaks due to the adsorbed acetate species cannot be clearly distinguished in the $\mathrm{ZnSe} / \mathrm{EVA}$ spectra. This could be due to the presence of the EVA matrix in which the ZnSe nanopaiticles are dispersed. The peak at $1121.91 \mathrm{~cm}^{-1}$ observed on $4 \% \mathrm{ZnSe} / \mathrm{EVA}$ corresponds to the C-O group carboxylic derivates may be due to residue of Zinc acetate used in the reaction. The peak at $608 \mathrm{~cm}^{-1}$ represents the out of plane bending of $\mathrm{C}-\mathrm{H}$ alkenes and the peak at $3434.72 \mathrm{~cm}^{-1}$ is the characteristics absorption peak of ZnSe , authenticates that the preparation technique is faithful. The stretching vibrations of C-H alkanes are contributed the transmittance peaks at $2920 \mathrm{~cm}^{-1}$ and $2850.28 \mathrm{~cm}^{-1}$. The changes in the relative intensities of the bands in the region 1464 $\mathrm{cm}^{-1}, 1427 \mathrm{~cm}^{-1}$ and $1121 \mathrm{~cm}^{-1}$ in composite can be due to the presence of absorbed species on the surface of the ZnSe nanoparticles.

### 3.3. Refractive Index Studies

The refractive index of EVA/ZnSe has been determined using the measurement of dielectric constant with the help of LCR Impedance analyzer, by Maxwell's rule [16] [17].

$$
\begin{equation*}
n=\sqrt{\left(\varepsilon_{r} \cdot \mu_{r}\right)} \tag{3.1}
\end{equation*}
$$

where $\varepsilon_{r}$ is the relative permittivity and $\mu_{r}$ is the relative permeability. $\mu_{r}$ is 1 for non-magnetic materials. The dielectric constant of the sample is calculated using the relation
$€_{\mathrm{r}}=\mathrm{Cd} / €_{0} \mathrm{~A}$; where the nanocomposite acts as a dielectric with $€_{0}$ the absolute permittivity, C is the capacitance, d is the thickness and A is the area $\left(\mathrm{mm}^{2}\right)$ of the $\mathrm{ZnSe} / \mathrm{EVA}$ composite. It is reported that EVA posses almost unchangeable index of refraction in entire electromagnetic region. In this study, we investigated the


Figure 1. TEM image of ZnSe nanoparticles.




Figure 2. The comparison of FT-IR spectra of pure EVA, $2 \% \mathrm{ZnSe} / \mathrm{EVA}$ and $4 \% \mathrm{ZnSe} / \mathrm{EVA}$ nanocomposites.
variation refractive index by varying frequency from 100 Hz to 1 MHz . The results of the variation of refractive index as a function of frequency for samples of different ZnSe nanoparticle concentration dispersed in EVA polymer matrix are shown in Figure 3. It is observed that the index value of pure EVA is 1.52 at room temperature and it increased to 2.28 as the concentration of ZnSe becomes $4 \%$. Commonly, the micro-structured coating of EVA and $\mathrm{ZnSe} / \mathrm{EVA}$ nanocomposites allow a rough approximation for uniform index value in entire varied frequency region except for very low frequencies. It showed the value of index could go up to 5.7 below 500 Hz . Figure 4 shows variation of refractive index with temperature. We examined the results using $4 \% \mathrm{ZnSe} / \mathrm{EVA}$ nanocomposite and showed that there should be a slight decrement in these values by increasing temperature. The calculations are carried out from room temperature to 353 K and sample possessed reproducibility.

In short, the average index profiles samples could be controlled from 1.52 to 2.28 by homogeneous dispersion of ZnSe nanoparticle in threshold concentration. The index difference of about 0.8 could be achieved easily from pristine matrix. By the inclusion of composites with different refractive indices, multi-layer anti-reflective coating and photovoltaic modules can be effectively modeled.


Figure 3. Plot showing the variation of refractive index as a function of frequency.


Figure 4. The graph of refractive index $\mathrm{v} / \mathrm{s} \log \mathrm{f}$ for different temperatures.

### 3.4. Optical Absorption Studies

The UV-Vis-NIR spectra of the $\mathrm{ZnSe} / \mathrm{EVA}$ nanocomposites are recorded in the region 200 to 2000 nm are shown in Figure 5. The bandgap of the prepared nanocomposites has been determined using the Tauc-relation [18]

$$
\begin{equation*}
\alpha h v=K(h v-E g)^{n / 2} \tag{3.2}
\end{equation*}
$$

where $h v$ is the photon energy, $\alpha$ is the absorption co-efficient, $E g$ is the band gap, A is a constant and $\mathrm{n}=1$ for the direct band gap [19]. For allowed direct transition, a graph between $(\alpha h v)^{2}$ and $h v$ is plotted, extrapolation of the straight line to $(\alpha h v)^{2}=0$ axis gives the value of the band gap. It is shown in Figure 6. The estimated band gap of pure EVA and $2 \%$ and $4 \% \mathrm{ZnSe}$ nanoparticles dispersed in EVA host matrix is found to be around 4.74 $\mathrm{eV}, 4.44 \mathrm{eV}$ and 4.08 eV respectively. The band gap of the prepared composites showed a marked decrement when the percentage of nanoparticles is increased.

### 3.5. TG-DTA Analysis

EVA undergoes both physical and chemical changes while heating so that a clear distinctive thermal analysis is


Figure 5. UV-Vis-NIR Spectra of EVA and $\mathrm{ZnSe} / \mathrm{EVA}$ nanocomposites.


Figure 6. The band gap variation of EVA along with $\mathrm{ZnSe} / \mathrm{EVA}$ nanocomposites.
needed. The Thermogravimetric (TG) and Differential Thermal Analysis (DTA) on pure and composite EVA polymer are carried out between room temperature to $500^{\circ} \mathrm{C}$. The TG-DTA traces of pure and doped samples are shown in Figures 7(a)-(c). It seemed nearly same behaviour for three samples with two steps decomposition between $290^{\circ} \mathrm{C}$ to $500^{\circ} \mathrm{C}$. It is clear that the Pure EVA is thermally stable up to $298^{\circ} \mathrm{C}$ whereas $2 \% \mathrm{ZnSe}$ and $4 \%$ ZnSe doped EVA is stable upto $309^{\circ} \mathrm{C}$ and $315^{\circ} \mathrm{C}$ respectively. Thus the thermal stability of the EVA nanocomposite increased with increasing the filler concentrations. $28.5 \%$ of weight lost in the first stage decomposition of Pure EVA, but once can easily found from the thermogram that the weight loss in the first stage decomposition decreases as filler concentration increases and found to be $17.3 \%$ and $14.2 \%$ for $2 \%$ and $4 \% \mathrm{ZnSe} / \mathrm{EVA}$ respectively.

### 3.6. Mechanical Properties

The virgin EVA samples showed tensile strength in the range of $29-31 \mathrm{MPa}$, with $430 \%$ elongation. The effect of nano ZnSe on tensile strength and elongation at break is shown in Figure 8. The $2 \%$ addition of ZnSe nanoparticle found to reduce the tensile properties of the composite compared to the virgin compound. The reduction of tensile strength at higher ratio of nano loading was due to the stress concentration at the interface ZnSe particles agglomerates. As the loading level increases the effect of dispersion and distribution of nanomaterials gets reduced. Percentage stretch possible with the nanocomposite samples reduces with ZnSe loading. This phenomenon is already reported with polymer based nanocomposites as the matrix molecular orientation is negatively affected with the reinforcement particles [20].

The peel strength increases for EVA-ZnSe composites on all substrates on $2 \%$ incorporation. The adhesion properties differs, based on the molecular interactions of the adhesive with the adherent. Figure 9 shows peel strength of the nanocomposite with different ratios of ZnSe . It is observed that the molecular flexibility of EVA is not affected by $2 \%$ of ZnSe on all substrates. The improvement in cohesive strength resulting from the presence of ZnSe might be responsible for the improvement in peel strength. The lack of distribution with increased amount of nano particles might be the underlying reason for the drastic reduction of peel strength at $4 \%$ loading. It can also be inferred that there is a maximum ratio ( $2 \%$ ) for ZnSe , above which the inherent polymer property is adversely affected.

(a)


Figure 7. (a) TG-DTA Curve of EVA co-polymer; (b)TG-DTA Curve of $2 \% \mathrm{ZnSe} / \mathrm{EVA}$ nanocomposite; (c)TG-DTA Curve of $4 \% \mathrm{ZnSe} / \mathrm{EVA}$ nanocomposite.


Figure 8. Comparison of tensile strenth and \% elongation with various concentration of ZnSe filler in EVA.


Figure 9. Plot showing the peel strength of EVA/ZnSe nanocomposites on various substrate.

## 4. Conclusion

A facile approach towards the synthesis of ZnSe nanoparticles and $\mathrm{ZnSe} / \mathrm{EVA}$ nanocomposites was established. The synthesized particle's size was estimated as 80 nm . FT-IR analysis confirmed the presence of polymetric group of EVA, compared with its composites and corroborated the presence of ZnSe particles. The value of index of refraction of the composite could be easily controlled by varying the amounts of dispersed ZnSe nanoparticles. The band gaps of the pure, $2 \%$ and $4 \% \mathrm{ZnSe} / \mathrm{EVA}$ were found to be $4.74 \mathrm{eV}, 4.44 \mathrm{eV}$ and 4.08 eV respectively, thereby increasing the conductivity of the EVA with increasing the filler concentrations. The thermal stability of the samples increases with increasing the filler concentrations. The mechanical properties of the samples were also studied. The tensile strength and peel strength of the nanocomposites increase initially and drop down with ZnSe filler loading.

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# Linguistic Minorities and Education in Mother Tongue 

- Stany Thomas and Sheeja Kuriyakose



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## Journal of applied research and social sciences

# LINGUISTIC MINORITIES AND EDUCATION IN MOTHER TONGUE 

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#### Abstract

Linguistic heterogeneity is a peculiar feature of Indian society. The language rights and protection of linguistic minorities was a major concern since pre-independent period. The denial of linguistic rights not only hampers the cultural development of a community, but is also detrimental for the social and economic development of the minority and for the society as such The problems of linguistic minorities have been the focus of research and planning for educational and administrative reasons. An educational policy at the national level has developed to ensure the mother tongue education through Three language formula. But still the language maintenance and development is a concern of smaller language groups. This paper seeks to explore scope of education in mother tongue for linguistic minorities and introduces certain suggestions for their language development


Language is one of the most important of those human characteristic on the basis of which people are not supposed to be discriminated against. Others are gender," race" and religion. (Tove Skutnabb -Kangas) in (Ricento,2006:275).Language is closely related to culture and therefore to the customs of the people. Besides, the massive spread of education and growth of mass literacy can occur only through the medium of the mother-tongue.

Democracy can become real to the common people only when politics and administration are conducted through the language they can understand. But this language, the mother tongue
cannot be the medium of education, administration, or judicial activity unless a state is formed on the basis of predominant language. Thus the reorganisation of states on the basis of language, a major aspect of national integration and consolidation, came to the fore almost immediately after Independence. But linguistic reorganistion did not of course, resolve all the problems relating to linguistic conflicts.

The immediate problem related with language after linguistic reorganisation was the problems of linguistic minorities. This paper focuses on the rights of linguistic minorities especially their educational safeguards to protect their identity by learning through mother tongue.

## Mother Tongue -Definition

In popular parlance the language categories of India are variously designated as mother tongues, minority languages, regional languages, scheduled languages, official languages, and national languages.( Manish Kumar Thakur,2002) .

Mother tongue of an individual has an undoubted importance in the maintenance of the culture and dignity of an individual even if he/she belongs to majority or minority language group. Mother tongue can be defined narrowly or broadly according to Khubchandani (2001: 4). The narrow definition of mother tongue as a child's home language is exemplified in the 1951 Census definition: "The language spoken from the cradle...in the case of infants and deaf mutes... the mother tongue of the mother" (Khubchandani 2001: 4)in (Cy nthia Groff,2007:19)

Mother tongue is the medium of one's own inner thoughts and contemplations. Thought and language are interrelated. Hence for acquiring knowledge in a better and unambiguous way, the mother tongue is the best medium. It has been scientifically proved that assimilation of facts is easier through one's own language. .(Chand RajM K, 2011)

The Constitution of India today has 22 languages in its Eighth Schedale which are known as Scheduled languages which constitute 93 mother tongues. The rest 100 languages which are not in the Schedule are given nomenclature Non-scheduled languages. They subsume 141 mother tongues.(Mallikarjun,2012). Indian constitution preserves political unity and cultural and
linguistic diversity by providing language rights to both majority and minority languages, the vehicle of culture and dignity of citizens.

## Hierarchy of Languages -Position of Linguistic Minorities

The language scene in post-Independence India seems to be characterised by a definitive hierarchy, at least in terms of official status (Brass 1994: 175).For obvious reasons, Hindi and English occupy top positions in the official hierarchy. Regional languages come next, having been recognised as official languages in the linguistically reorganised states, may, the very basis of their organisation, and also for having found a place in the coveted Eighth Schedule of the Indian Constitution. At the third level are languages listed in the Eighth Schedule but having been deprived of the luxury of territorial anchorage in particular provinces such as Sanskrit, Sindhi and Nepali (Gorakhali). At the lowest level are those mother tongues which are not recognised either as official languages of India or of any state and are not listed in the Eighth Schedule which, in fact, constitute the bulk of minority languages. (Manish Kumar Thakur,2002)

## On defining 'Linguistic Minorities'

While the definition of linguistic minorities was not included in the Constitution, a Supreme Court decision defined minority language as separate spoken language, not restricted to languages using or having a separate script (Dua 1986: 134).Myron Weiner defines as "Linguistic minorities include those who speak the language of a contiguous neighbouring state and who are a minority by virtue in which the state boundaries have drawn " Generally linguistic minorities in federal India are defined in relation to their State of residence, and the vast majority of more than 120 million Indian citizens belonging to linguistic minorities are "relative minorities": speaking one of the "scheduled languages", which is an official language in another State of the Union, but not in their own State, as their mother tongue. Only 3\% of India's total population, about 30 million people, mostly tribal communities, speak "non-scheduled languages" - India's less protected and often most threatened languages. They can be termed "absolute minorities", as no kin-state or major speech community is taking care of their protection. Most of these languages are not taught in any school, or recognized for any use in public administration. Many of these languages have no script and thus are deprived of any representation in modern culture and media. This fact does not mean that mere inclusion in the

8th Schedule of the Indian Constitution will be sufficient to solve all their problems( Benedicter 2013:113)

## Language rights

"Linguistic rights should be considered basic human rights. The right to speak, to learn, to educate and unfold all cultural activities in one's own mother tongue, in addition to other official languages, is enshrined in many Constitutions of the world

The framers of the Constitution of India recognized the importance of addressing "the problem of the minorities," a universal issue in democracies, and they "had a firm faith that healthy national consciousness would grow if the minorities are guaranteed liberty, equality, fraternity and justice" (Kumar 1985: 9).Educational safeguards for minorities in the constitution through specific safeguards guarantees learning through the medium of mother tongue. This is introduced in article 350-A the most important safeguard for linguistic minorities, by the recommendation of State Reorganisation Commission in 7th amendment Act 1956

## Linguistic minorities-provision under SRC

The State Reorganisation Commission had foreseen clearly that none of the States could be absolutely unilingual and that each State would have to tackle the question of linguistic minorities within its territory in a manner that satisfied their legitimate aspirations. However, it envisaged that a state could be unilingual where the speakers of a particular language constituted $70 \%$ or more of the total population.

The administrative safeguards for linguistic minorities in regard to the use of their languages for official and allied purposes in Home Ministry's Memorandum in 1956 can be summarised as follows : It constituted a landmark in inter-lingual adjustments and served as an all-India code embodying the agreed minimum of safeguards for the smaller language groups in the States and Union Territories.
(i) Where any language is spoken by 30 per cent or more of the population in any State or district, the State or district would be recognized as bilingual and the minority language
concerned would be placed on the same footing as the regional language for official purposes.
(ii) Where the linguistic minority constitutes 15 to 20 per cent of the population in any areas, Government notices, rules, laws etc. will be reproduced in the language of the minority in that particular area;
(iii) The linguistic minorities have the right to represent to any officer or authority of the Union or in the States as the case may be, in their own language even if that language is not mentioned in the Eighth Schedule. Safeguards have also been provided to linguistic minorities in regard to State services. These are two-fold; firstly no restrictions are to be imposed with reference to the residence of candidates for recruitment to any branch or cadre of State services; and, secondly, linguistic minorities who constitute 15 to 20 per cent or more of the population of the State have been given the option to elect as medium of examination, in any examination being conducted for recruitment to the State or the district services, their own language. Subordinate services are not included. The test of proficiency in the State language may, in the second category of cases, be held after selection but before the end of probation.

The State Governments have also been advised that where any cadre included in the subordinate services is treated as a cadre for district, any language which has been recognized as an official language in the district should also be recognized as a medium for the purposes of competitive examination in the district. (SRC Report 1956,205 )

In order to ensure proper implementation of these safeguards for linguistic minorities Union Government, accordingly, came up with certain amendments to the Constitution, embodied in the Constitution (Seventh Amendment) Act, 1956. It added Articles 350-A and 350-B to the Constitution.

## Provisions in the Constitution

The constitutional provision under Article 345 empowers the States to allow the use of languages other than the official one, for purposes and areas to be specified, and does not stipulate any percentage of population for the eligibility of a linguistic minority to concessions or special protection. Once the provision of facilities, like the translation of gazettes, notices,
etc., the right to present applications, etc., in courts and government offices in one's mother tongue, is agreed to in principle and acted upon by a State, they should automatically become available to smaller concentrations as well, without any significant increase in expenditure or addition of staff.

Several articles of the constitution adequately protect and provide safeguards to the minorities. In this respect there are two opposing trends: `equality' and special preference'. At the outset ,there are general rights enshrined in articles $14,15,16,19,20,21,22,23,24,25,26,27,28$ in the chapter in the fundamental rights which are applicable to all citizens including minorities. These confer equality. Besides special rights are conferred to minorities under articles 29 and 30. While article 29 is applicable to all the citizens of India, Article 30 is applicable only to religious and linguistic minorities.(Bhasha Sagar, 2008:34 )They provisions in the above articles are as follows;

## 29. Protection of interests of minorities.-

1. Any section of the citizens residing in the territory of India or any part thereof having a distinct language, script or culture of its own shall have the right to conserve the same.
2. No citizen shall be denied admission into any educational institution maintained by the State or receiving aid out of State funds on grounds only of religion, race, caste, language or any of them.

## 30. Right of minorities to establish and administer educational institutions.-

1. All minorities, whether based on religion or language, shall have the right to establish and administer educational institutions of their choice.
2. 

a. In making any law providing for the compulsory acquisition of any property of any educational institution established and administered by a minority, referred to in clause (1), the State shall ensure that the amount fixed by or determined under such law for the acquisition of such property is such as would not restrict or abrogate the right guaranteed under that clause.
3. The State shall not, in granting aid to educational institutions, discriminate against any educational institution on the ground that it is under the management of a minority, whether based on religion or language.

## Special Directives

Under Article 347, minorities enjoy even a political safeguard which allows other minority languages for official use in any province under President's consent (Azam,1981:132) The constitution itself provided adequate safeguards to linguistic minorities under its articles350, 350A , 350 B , which is as follows:

## 350. Language to be used in representations for redress of grievances.-

Every person shall be entitled to submit a representation for the redress of any grievance to any officer or authority of the Union or a State in any of the languages used in the Union or in the State, as the case may be.

## 350A. Facilities for instruction in mother-tongue at primary stage.-

It shall be the endeavour of every State and of every local authority within the State to provide adequate facilities for instruction in the mother-tongue at the primary stage of education to children belonging to linguistic minority groups; and the President may issue such directions to any State as he considers necessary or proper for securing the provision of such facilities.

## 350B. Special Officer for linguistic minorities.-

1. There shall be a Special Officer for linguistic minorities to be appointed by the President.
2. It shall be the duty of the Special Officer to investigate all matters relating to the safeguards provided for linguistic minorities under this Constitution and report to the President upon those matters at such intervals as the President may direct, and the President shall cause all such reports to be laid before each House of Parliament, and sent to the Governments of the States concerned.

In some regions, such as autonomous minority regions, a particular linguistic minority may constitute the majority population and may have in place extensive provisions for the use of its language as the dominant language of the region in administration, education and service
provision. In such cases it is important to ensure the language rights of those belonging to other communities who may find themselves de facto linguistic minorities in certain localities despite constituting a majority nationally.(Ishak Rita 2012:8). Whichever minority language group is involved, it remains the responsibility of states to provide for the educational , and other needs of minorities in Public life.

Today significant challenges are faced by minorities in all regions who speak minority languages and wish to maintain and use them in public and private life (Ishak Rita 2012:67).Most important among that is their education in their mother tongue.

## Education of Linguistic Minorities

## Three Language Formula

In independent India the demand for a general education system based on mother tongues as media of instruction was associated with the cultural and political resurgence of the "linguistically defined States", in addition to the democratic principle of ensuring equality of opportunities through education.(Benedicter,2013:67). Restrictions on minority languages in the field of education are particularly sensitive and can be the cause of grievances of linguistic minorities. The 1992 Declaration on Minorities states that wherever possible minorities have the right to learn or to have instruction in their mother tongue (art. 4, para. 3)

The founding fathers of the Indian Constitution wanted to ensure that the children get their education through their mother tongue at least at the primary level. Patriotic fervor, pragmatism, as well as the findings of "science" were the motivating factors for this desire.

## .(Ramaswamy K,2001)

Three language formula is implemented to promote mother tongue education national level. It is an educational strategy (three Language Formula) for communication between people at the national, regional and local levels (Srivastava, 2007: 43) The National Policy on Education 1968 recommended the inclusion of the TLF 'which includes the study of a modern Indian language, preferably one of the Southern languages, apart from Hindi and English in the Hindi speaking states, and of Hindi along with the regional language and English in the nonHindi speaking states,' at the Secondary stage. This was reiterated in the Education Policy 1986 and was adopted as the Programme of Action by the Parliament in 1992. (mallikarjun, 2004)

## The revised TLF proposed the length of contact years for languages as follows:

| $\begin{aligned} & \text { Languages to be } \\ & \text { taught under TLF } \end{aligned}$ | No of years to taught | $\begin{aligned} & \text { Languages to be } \\ & \text { taught under TLF } \end{aligned}$ | No of years to taught |
| :---: | :---: | :---: | :---: |
| Mother tongue/ | 10 years | Mother tongue/ | 10 years |
| Regional language |  | Regional language |  |
| Official language Hindi/ English) | 6 years (starting from class V onwards) | Official language Hindi/ English) | 6 years (starting from class V onwards) |
| Modern Languages not covered under the two | 3 years minimum | Modern Languages not covered under the two | 3 years minimum |

(Source from Singh 2000: 193)
The multilingualism promoted in the Three-Language Formula springs in part from a concern for maintaining the status of the official and regional languages. Concern continues in India for the maintenance and spread of the official Indian languages. This includes a concern that some Indians, especially the elite, feel the need only to learn English, minimizing the value of learning Indian languages(Cynthia Groff,2007) Still parents see only the advantage in career options that may be available to their children if they get educated through the medium of English right from the beginning level of school education.(Ramaswamy K, 2001)

## Difficulties with the implementation of TLF

With the Three-Language Formula, those students whose mother tongue is not a regional language end up learning four languages, and possibly three or four scripts since their mother tongue is not the same as the state majority language. This has been seen as one drawback of the policy. According to Annamalai (2001: 73) "this conflict has not yet been resolved politically and pedagogically." Some have referred to the policy as being 3 plus or minus one (Ager 2001: 29), since Hindi speakers need only learn two languages and minority-language speakers end up with four. Knowing four languages should certainly not be thought of as a disadvantage. Rather children who are educated through the medium of an unfamiliar language face greater learning challenges than their peers (Jhingran 2005).

While overall a broad consensus exists among states, implementation of the ThreeLanguage Formula varies considerably. According to Ekbote (1984), difficulty in the
implementation of the Three-Language Formula comes from the following factors: (a) the "heavy language load in the school curriculum," (b) northern schools not being motivated to teach south Indian language, (c) southern schools, especially in Tamil Nadu, resisting the teaching of Hindi, and (d) the cost of arranging for instruction. The formula has been adapted by the various states in various forms and in various contexts. Some stick to two languages, some need four, some provide additional optional languages.

## Other Issues in Educational sector

In the educational sector, lack of schools having minority language as medium of instruction and unavailability of trained teachers and text books cause a major problem. The vacancies of Tamil teachers are not filled up at primary, secondary and higher secondary levels. Even when teachers are appointed they are not adequately trained. Delay in the disbursement of salaries to teachers, lack of government programmes, etc., were some of the issues raised by representatives of linguistic minority communities across the States. The lack of text book at the beginning of the year is another issue. Lack of residential schools for minorities is another problem. Educational backwardness in turn affects social awareness, job opportunities and development of the linguistic minorities

The linguistic minorities themselves need to develop a better understanding of the overall needs of their communities(J. C. Sharma:2001) Lack awareness of the linguistic safeguards among linguistic minorities is directly related to their educational backwardness .Minorities should develop a positive attitude towards their language and should have an awareness about the needs and aspirations of the community

Language policies in the states of the Indian Union certainly protect the rights of the linguistic minorities. However, it is important for the minorities that they learn the dominant language of their state for their own social and career benefits. Because of this change in attitude (noticed simultaneously also among the people who speak the dominant language of the state as their mother tongue), the contours of Indian multilingualism are fast changing. There is a lack of genuine desire to learn other Indian languages

## Suggestions to promote minority languages

In order to promote a language, compilation of a good grammar is a must so that the language can be taught in a proper setting.
2. A comprehensive dictionary with etymology would be essential for taking up the study of the language.
3. A proper and efficient machinery for the translation of the books from one language to another must be set up to make available current knowledge in other languages.
4.The authors in the language concerned should be encouraged by the suitable incentives, rewards etc.
5. The text books for the language should be prepared and should be available at a nominal cost.This would involve suitable financial assistance to the authors and the publishers.
6. For the the languages which do not have a recognised script at present , the script of the local principal language should be adopted(with such modifications as may be necessary).
7. The modern tools like computers should be used to popularise and to teach the language.
8. The provision for adequate number of language is a must. They should be properly trained for the purpose of teaching the language. Mere knowledge of the language should not be considered to be enough.
9. In the nomadic tribe areas , mobile schools should be set up. The persons from community itself should be appointed as the teachers.
10. A separate workshop should be held for the subject of use of minor languages in education with a duration of two to three days so that the points can be discussed elaborately (CLM Organisation, Conference On Minor Languages,2007:12)

## CONCLUSION

Several States' domestic legislation on minority rights is still half-hearted, incoherent and insufficient for this purpose. India, on the contrary, conferred constitutional value on the right of minorities to protect their identity from the very beginning. The Indian constitution is clear in its principles, but far less advanced in the level and substance of the single rights seen as indispensable for cultural survival in the modern world.(Benedicter,2013; Even though linguistic rights are protected in Indian democracy by
giving preferential status through special legislations , directives and orders and their proper implementation is the significant element to achieve the goals.

Although the Indian Constitution does not promote favoritism for minorities and does not make them an added burden on the states, it remains the state's obligation to provide for the minorities and for their educational rights (Ekbote 1984: 199). Yet, vigilance is still needed in protecting the status of minority languages and insuring justice, particularly equitable access to education for speakers of all languages. Besides demonstrating the need for caution in language planning in practice, the Indian example informs and stretches the language planning frameworks used to analyze it. (Cynthia Groff ,2007:17)

The actualisation of minority rights and a sympathetic approach on the part of the majority may go a long way to the minimisation of the problem. In spite of constitutional and other minority safeguards, the governmental system in general ,systematically negating the use of minority language in education and administration. A comprehensive approach based on re conceptualisation, the 'linguistic' minority into the cultural minority, is an urgent matter of concern. Because the problem of minorities is a problem of cultural persistence. After all stability of the multicultural society like India highly depends on the policy of cultural equity. It can be achieved through the initiation of a new policy planning to linguistic subcultures in Indian states.

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# Lingustic Profile of India and the Constitutional Provisions Relating to Languages 

- Stany Thomas and Sheeja Kuriyakose


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# Linguistic Profile of India and the Constitutional Provisions relating to Languages 

Dr. Stany Thomas. ${ }^{1}$ \& Sheeja. Kuriyakose. ${ }^{2}$


#### Abstract

Reorganization of the geographical boundaries within the nation as linguistic states was a major step in the management of multilingualism and such reorganization empowered multilingualism further. Managing Indian Multilingualism formally got underway with the nation's acceptance of its Constitution. It was in the form of inclusion of select languages in the Eighth Schedule, recognition of some language/s as official languages of the Union and providing for the States to do the same as their official languages, acceptance of languages for different levels of judiciary, use in parliament and state legislatures, and not recognizing any language/s as language/s for education but recognizing the rights of different kinds of linguistic minorities. Since her independence, India is managing multilingualism by protecting the language rights of every linguistic group through policies and laws of language use in administration, judiciary, education and other domains of public life. This paper discusses the status of languages in Indian linguistic federalism and the provisions related with languages in the constitution.


The linguistic diversity of India has so often stressed that only a brief recapitulation of the main points will be sufficient to introduce the subject. India is, the only part of the world where so many different human races having living together for centuries. These include the Australoids, the Veddids, The Negritoids, the Melano Indians, the Mongoloids and the Aryans (Minor languages report: 4)

India's linguistic landscape is shaped by four language families. They are, from north to south: the Tibeto-Burmese, Indo-European (Indo-Aryan), Austro-Asiatic (Munda, Khasi) and Dravidian family. There are also some isolated languages, such as Arbi (Arabic, thus Hamito-semitic family), while Kusunda and Andamese are probably linked to the Indo-Pacific family (Benedicter, 2013).

## The Indian language Families

Table-1: Indian language Families

| S.No | Language Family | Number of <br> languages | Percentage on <br> total Population |
| :---: | :---: | :---: | :---: |
| 1 | Austro-Asian | 14 | 1.13 |
| 2 | Indo-European | 17 | 22.53 |
| 3 | Dravidian | 20 | 75.30 |
| 4 | Tibeto-Burmese | 62 | 0.97 |
| 5 | Semito-Hamitic | 1 | 0.1 |

There is no official inventory of languages spoken in India that reports all languages recognised by linguists. The only source listing the languages is the official Indian

[^1]census,1991(Benedicter,2013:12). 1991 Census lists 216 mother tongues with a total number of speakers 10,000 or more at all India level, grouped into 116 languages of which 22 mentioned in the Constitution are called scheduled languages.(Mishra:2007;33) and 94 are outside it. There are 'other languages', number unspecified, which have less than 10,000 speakers (Minor languages report: 80)

The 8th Schedule is "the most important language policy statement" in India .listed in Schedule VIII, Articles 343-51 (Benedicter, 2013:16). while those languages not included in the scheduled twenty two are listed as "minority languages". A close examination clearly shows that the criteria used to divide languages into "scheduled" and "non-scheduled" (minority) languages fail to account for the status of languages in India (Pandharipandey, 2002: 3).

Some groups considered to be linguistic minorities since their language is not one of the 22 official languages have populations of over 3 million (King 1997: 5) populations exceeding those of some European countries. In 1981, eighty-seven of the non-scheduled languages had more than 10,000 native speakers (Khubchandani 2001: 11). According to the 1991 census, groups speaking non-scheduled languages make up 4\%of India's population (Groff Cynthia, 2007:15-41).

TABLE-2 GROUPING BY FAMILY OF THE 122 SCHEDULED AND NON-SCHEDULED LANGUAGES -2001

| Language Families | Number of <br> Languages | Persons who returned <br> the languages as their <br> mother tongue | Per centage <br> to total <br> population |
| :---: | :---: | :---: | :---: |
| 1. Indo-European <br> (a) Indo-Aryan | 21 | $790,627,060$ | 76.86 |
| (b) Iranian | 2 | 22,774 | 0.00 |
| (c) Germanic | 1 | 226,449 | 0.02 |
| 2. Dravidian | 17 | $214,172,874$ | 20.82 |
| 3. Austro-Asiatic | 14 | $11,442,029$ | 1.11 |
| 4. Tibeto-Burmese | 66 | $10,305,026$ | 1.00 |
| 5. Semito-Hamitic | 1 | 51,728 | 0.01 |
| Total | 122 | $1,026,847,940^{*}$ | $99.82^{*}$ |

## (Census India, 2010-11)

In 1951, besides the 14 languages recognised in the Indian Constitution there were also mentioned 23 major tribal languages and 24 other minority languages in several other offiial documents, including the Census. Each of these languages had over one lakh speakers. However, in the later Census documents, the population figure of 10,000 was taken as a bench mark.

There is a wide variation in the estimates or the languages in use in the country. The 1961 Census reports mentioned a total of 1,652 "mother tougues"out of which 184 had more than 10,000 speakers. The encyclopedic people of India series of the Anthropological Survey of India, identified 75 "major languages" out of a total 325 languages used in Indian households (Minor languages report :7)

While the Indian Constitution does not define or use the word minor or minority languages, (although there is a mention of linguistic minority), as per Census of India -1961, different categories of languages documented in the country are listed in Table-3(Misra,

2007 32-33).The 1961 census recognised 1,652 mother tongues spoken by $438,936,918$ people, counting all declarations made by any individual at the time when the census was conducted.

TABLE-3: Languages/Mother Tongues in the Country

| S.No. | Description | No. of Mother <br> Tongues | Total No. of <br> Speakers |
| :---: | :---: | :---: | :---: |
| 1. | No. of mother tongues returns of <br> the country. | 1652 | $438,936,918$ |
| 2. | No. of mother tongues attested in <br> Linguistic Surveyof India <br> classification | 572 | $436,224,545$ |
| 3. | No. of mother tongues not traced in <br> Linguistic Survey of India but <br> tentatively classified | 400 | 426,076 |
| 4 | No. of mother tongues attested in <br> Linguistic Survey of India but <br> tentatively reclassified | 50 | $1,908,399$ |
| 5 | No. of mother tongues considered <br> unclassified. | 527 | 62,432 |
| 6 | Foreign mother tongues | 103 | 315,466 |
| Source: Census - 1961 |  |  |  |

## Eighth Schedule (ES) [Articles 344 (1) and 351]

The Constitution of India adopted on November 26, 1949 in the Constituent Assembly listed 14 languages in the Eighth Schedule. The same in the last 60 years is amended thrice through Constitution Amendment Bill No. 21 in 1967, to include Sindhi, Bill No. 71 in 1992 to include Konkani, Manipuri and Nepali and Amendment Bill No. 100 in 2003 to include Bodo, Dogri, Maithili and Santali. Thus at present there are 22 languages in the Eighth Schedule. Inclusion in Eighth Schedule provides formal and Constitutional recognition to dominant regional languages in the spheres of administration, education, economy and social status (Sarangi, 2009: 27). As on today requests from the speakers of 38 other languages are pending before the Government of India for inclusion in to the Schedule.(Mallikarjun:2012,19)

TABLE - 4 Eight Schedule Languages at the time of formation of the Constitution

| 1. Assamese | 6. Kashmiri | 11. Sanskrit |
| :--- | :--- | :--- |
| 2. Bengali | 7. Malayalam | 12. Tamil |
| 3. Gujarati | 8. Marathi | 13. Telugu |
| 4. Hindi | 9. Oriya | 14. Urdu |
| 5. Kannada | 10. Punjabi |  |

(Groff, 2003: 5)

TABLE - 5 Present eighth schedule languages

| 1. Assamese | 7. Kannada | . 13. Marathi. | 19. Sindhi. |
| :--- | :--- | :--- | :--- |
| 2. Bengali | 8. Kashmiri. | 14. Nepali. | 20. Tamil. |
| 3. Bodo | 9. Konkani. | 15. Oriya. | 21. Telugu. |
| 4. Dogri | 10. Maithili. | 16. Punjabi. | 22. Urdu |
| 5. Gujarati | 11. Malayalam. | 17. Sanskrit. |  |
| 6. Hindi | 12. Manipuri. | 18. Santhali |  |

(Government National Portal of India, 2010)
Details of the Eighth schedule languages together with the number of speakers of each of these languages are given in Table -6

TABLE -6 Scheduled Languages in Indian Constitution and their Speakers

| 1. | Assamese | $13,079,696$ | 1.55 |
| :---: | :--- | :---: | :---: |
| 2. | Bengali | $69,595,738$ | 8.22 |
| 3. | Bodo* | $1,221,881$ | 0.15 |
| 4. | Dogri $^{*}$ | 89,681 | 0.01 |
| 5. | Gujarati | $40,673,814$ | 4.81 |
| 6. | Hindi | $337,272,114$ | 39.85 |
| 7. | Kannada | $32,753,676$ | 3.87 |
| 8. | Kashmiri | $56,693($ outside J\&K) <br> $3,174,684(1981$ fig $)$ | N.A. (1991) <br> $0.48 \%(1981)$ |
| 9. | Konkani | $1,760,607$ | 0.21 |
| 10. | Malayalam | $30,377,176$ | 3.59 |
| 11. | Manipuri | $1,270,216$ | 0.15 |
| 12. | Marathi | $62,481,681$ | 7.38 |
| 13. | Maithili* | $7,766,597$ | 0.93 |
| 14. | Nepali | $2,076,645$ | 0.25 |
| 15. | Oriya | $28,061,313$ | 3.32 |
| 16. | Punjabi | $2,33,78,744$ | 2.76 |
| 17. | Sanskrit | 49,736 | 0.01 |
| 18. | Santhali* | $5,216,325$ | 0.62 |
| 19. | Sindhi | $2,122,848$ | 0.25 |
| 20. | Tamil | $53,006,368$ | 6.26 |
| 21. | Telugu | $66,017,615$ | 7.80 |
| 22 | Urdu | $43,406,932$ | 5.13 |

Source: Census of India, 1991

* Bodo, Dogri, Maithili and Santhali which were Non-scheduled languages in 1991 were declared Scheduled languages in 2003 by $92^{\text {nd }}$ Amendment)


## Hierarchical ordering of Languages

Hierarchical ordering is a situation created by the inclusion of different languages in ES and special provisions for the same.Elangiyan (2007: 104) gives a good description of the kind of hierarchy that the EST has led to in India in the following table:

| First Tier <br> (Official <br> Languages of <br> the Union) | Hindi and English | English enjoys a special status even though <br> it is an associate official language. In spite <br> of consistent efforts by the union to <br> replace Hindi as the pan India official <br> language. Even after 6 3 years of <br> Independence English is still used in all <br> public domains. |
| :--- | :--- | :--- |
|  | State official languages <br> listed under ES e.g. Bengali, <br> Tamil, Kannada etc. and <br> Hindi due to its role as an <br> official language in some <br> Northern States of India e.g. <br> Uttar Pradesh, Madhya <br> Pradesh, Bihar etc. | These languages are powerful in their <br> respective states/regions. <br> These languages in due course are the ones <br> that enforce absolute compliance from all <br> the other speech communities in their <br> region. These are the languages that <br> actually threaten the survival of the <br> languages that are mentioned in the fourth <br> tier |
|  | Other language <br> communities in a state but <br> not the official state <br> languages because they <br> have fewer speakers than <br> the dominant state/regional <br> languages. E.g. Tulu, Coorgi <br> speakers in Karnataka state | Even though these languages only come <br> second to the dominant state/regional <br> language they still enjoy a special status <br> and recognition from the State <br> Governments because the members of <br> these speech communities have better <br> socioeconomic conditions and in some case <br> a considerable literary history. |
| Fourth Tier | These speech communities are generally <br> influenced by the dominant languages and <br> cultures leading to bilingualism and <br> multilingualism. <br> The use of the mother tongue is generally <br> restricted to fewer domains decreasing the <br> opportunities for speakers to use their own <br> mother tongue and gradually get <br> assimilated into dominant languages if <br> enough care is not taken by the state |  |

(Source Elangiyan, 2007: 104)

## Multilingualism - States and Union Territories

India is divided into 24 States and 8 Union Territories as units of administration. Originally such territorial divisions into provinces or states were done mostly for administrative convenience during the British rule. Presidencies, states, or provinces came
into being even as more territories were acquired by the British through various means and added to British India. As a result, the borders of such provinces cut across ethnic, religious, social, and linguistic lines. Even with the linguistic re-organization of the Indian provinces after the independence, most states remained multilingual as ever. However, in each of these linguistically re-organized states, there is at least one dominant majority linguistic group, often more than fifty percent of the total population of that state.

The table given below gives the main language and minority languages in every states and Union territories in India

TABLE-7 Linguistic Profile of the States and UTs

| S.No. | Name of State / UT | Main Language | Minority Language |
| :---: | :---: | :---: | :---: |
| 1 | Arunachal Pradesh | Hindi, Assamese, Adi, Apatani, Bhoti, Champati and Nishi | State Government claims that there no language has been recognised as minority language. |
| 2 | Andaman \& Nicobar | Hindi | Bengali, Tamil, Telugu, Malayalam, Nicobari,Kurukh/Oraon |
| 3 | Assam | Assamese | Bengali, Sadri, Hindi,Manipuri, Mising, Karbi, Garo, Bodo, Nepali, Hmar |
| 4 | Andhra Pradesh | Telugu | Urdu, Hindi, Oriya, Tamil , Kannada, Marati |
| 5 | Orissa | Oriya | Hindi, Telugu, Santhali, Kui, Urdu, Bengali, Gujarati |
| 6 | UP | Hindi | Urdu, Punjabi, Sindhi |
| 7 | Uttarakhand | Hindi | Urdu, Panjabi, Nepali |
| 8 | Karnataka | Kannada | Urdu, Telugu, Tamil Malayalam, Marati, Tulu, Lamani, Hindi, Konkani, Gujarati |
| 9 | Kerala | Malayalam | Tamil, Kannada, Konkani |
| 10 | Gujarat | Gujarati | Hindi, Marathi, Sindhi, Urdu, Telugu, Malayalam, Oriya, Tamil |
| 11 | Goa | Konkani | Marathi, Hindi, Kannada, Urdu, Malayalam |
| 12 | Chhatisgarh | Hindi | Bengali, Oriya, Telugu, Marathi, Gondi, Kurukh, Halabi , Urdu |
| 13 | Jammu and Kashmir | Dodri, Kashmiri | Urdu, Hindi, Punjabi, Ladakhi, Balti |
| 14 | Jharkhand | Hindi | Bengali, Urdu, Santhali, Kharia, Mundari, Ho, Kurukh, Oriya, Kurmali, Khortha |
| 15 | Tamilnadu | Tamil | Telugu, Kannada, Urdu, Malayalam, Hindi, Gujarati |
| 16 | Tripura | Bengali | Hindi, Kokborok, Chakma, Mogh, Halam, Manipuri, Vishnupriya Manipuri |
| 17 | West Bengal | Bengali | Hindi Santhali, Urdu, Nepali, Oriya, |


|  |  |  | Telugu |
| :--- | :--- | :--- | :--- |
| 18 | Punjab | Punjabi, Hindi | Urdu |
| 19 | Bihar | Hindi | Urdu, Bengali |
| 20 | MP | Hindi | Bhili/Bhilodi, Gondi, Marathi, Urdu, <br> Oriya |
| 21 | Manipur | Manipuri | Thado, Paiti, Tongkhul, Hamar, Mizo, <br> Hindi, Nepali, Mao, Kuki, Bengali |
| 22 | Maharashtra | Marathi | Urdu, Hindi, Gujatathi, Kannada, Telugu, <br> Bhili, Khandeshi |
| 23 | Mizoram | Mizo | Bengali, Tripuri, Nepali, Hindi, Hamar, <br> Pawai, Chakma |
| 24 | Meghalaya | Garo, Khasi | Assamese, Bengali, Hindi, Hajong, Nepali, <br> Koch, Rabha, Sinteng |
| 25 | Rajasthan | Hindi | urdu, Panjabi, Sindhi, Gujarathi, <br> Bhili/Bhilodi |
| 26 | Sikkim | Nepali | Lepcha, Limbu, Bhotia, Hindi, Sherpa, <br> Tamang, Newari,Gureng |
| 27 | Haryana | Hindi | Punjabi, Urdu |
| 28 | HP | Hindi | Punjabi |
| 29 | Chandigarh | Hindi | Punjabi |
| 30 | Daman Diu | Gujarati | Hindi, Marati |
| 31 | Dadra and <br> Nagar Haveli | Gujarati/ <br> Konkani | Hindi, Marati <br> 32 Delhi |
| Hindi | Punjabi, Urdu, Sindhi, Telugu, Tamil, <br> Bengali |  |  |
| 33 | Nagaland | Ao | Angami, Kuki, Lotha, Sema, Chokri, <br> Koniya |
| 34 | Puducherry | Tamil | Hindi, Malayalam, French, Arabic, Telugu, <br> Sanskrit |
| 35 | Lakshadweep | Malayalam/Mahl |  |

Source: Forty Second Report of the Commissioner Linguistic Minorities (2003-2004)

## Provisions relating to Languages in Indian Constitution

Provisions for languages in the constitution come under two categories, 'general' and 'specific'. General provisions in the constitution enshrined in articles 15,16,19, in the chapter in the fundamental rights which are applicable to all languages including that of minorities. These confer equality .In addition to that preamble, and fundamental duties also form the provisions for speakers of all languages in the constitution. Specific rights for the minorities constitute 29, 30, and Art.347, 350, 350A and 350B in the constitution are more specific for linguistic minorities

The official language of the new nation was declared in Articles 343-344 to be Hindi, written in the Devanagari script, with English as an auxiliary official language whose status
was to be reconsidered in fifteen years. Concerning the states, the Constitution allows for choice of official language, an important concession that was demanded particularly in non-Hindi-speaking states. Also, Section - 3 of the Official Languages Act, 1963 passed by the Parliament provides for the continued use of English along with Hindi even after 1965.

The Chapter XVII (Article 343 to 351) of the Constitution gives detailed information about the official languages of the Union and the State. Also The Official Language Policy of the Union has been thoroughly described under Article 120 (Part 5), Article 210 (Part 6), Articles 343, 344 and from Article 348 to 357 of the Constitution. Language provisions in PART XVII constitute Art. 348 and Art.349. Art. 348 provides for Language to be used in the Supreme Court and in the High Courts and for Acts, Bills, etc. Art. 348 Special procedure for enactment of certain laws relating to language. and articles 344 (1) and 351 deal with the provisions on VIII Schedule languages of Indian Constitution

All the 22 languages listed are represented on the Official Languages Commission of India and the state is expected to take measures for the development of these languages. This in itself was a step that crucified numerous tongues other than these 22 languages that have managed to gain the patronage of the state and the law-makers. The rest of the 400odd minority languages face dominance of one or more of these 22 languages in terms of language use in everyday life, in the administration, and in the education system ( 5 Srinivasa Rao:2008: 963s)

## Status of Minority languages

We find that the States in India have never been linguistically homogeneous (J. C. Sharma: 2001).According to the Census of India - 1961 no State/UT in India has fewer than 12 mother tongues. The number of mother tongues in different States/UT ranges from 12 410.Thus, we find that different States of India might have been declared uni- or bilingual for political exigencies or administrative convenience, but basically each of them is a multilingual and politically complex entity. Consequently, even if the State boundaries were drawn rigidly on the principle of uni- or bilingual criteria, the problem of linguistic minorities would remain unsolved.(Misra, 2007:33)

The debates of the Constituent Assembly of India reveal that Constitution makers gave a serious thought to the protection of the rights of linguistic minorities, but they had different viewpoints on the subject. Finally, Ambedkar succeeded in drafting the rights of linguistic minorities in the broadest sense and gave them the status of fundamental rights. As a result, the Constitution seeks to protect the rights of linguistic minorities with preferential status under the constitution.

The legal safeguards for the linguistic minorities in India derive their authority from three sources: the Constitution of india; the scheme of safeguards agreed to from time to time; and judicial decisions. .(Bhasha Sagar Jan 2008: 34)

A survey of rights of minorities as enshrined in the Constitution reveals that the minorities derive their rights from four sources/The rights minorities are emphasised and supported by the following constitutional provisions: 1. The ideals and values unequivocally declared in the Preamble of the Constitution. 2. Fundamental Rights as enshrined in part III. 3. Directive Principles of State Policy as enshrined in Part IV, and 4. Other provisions of the Constitution include Fundamental duties article 350, 350A, 350B, 347 .and representation to Anglo Indian community.

The provisions under Articles 29 and 30 are considered along with other provisions in the Chapter of Fundamental Rights and elsewhere in the Constitution safeguarding the rights of religious, linguistic and racial minorities, it becomes clear that the sole purpose of these provisions is to give linguistic minorities the right to preserve and develop their language and to facilitate teaching in mother tongue to their children in early ages.

## Special Directives

Under Article 347, minorities enjoy even a political safeguard which allows other minority languages for official use in any province under President's consent (Azam, 1981:132).

The article 350 guarantees the linguistic minorities the right to use a language they understand for redress of grievances. "Every person shall be entitled to submit a representation for the redress of any grievance to any officer or authority of the Union or a State in any of the languages used in the Union or in the State, as the case may be" (Government National Portal of India, 2010). This means that a representation cannot be rejected on the ground that it is not in the official language. Special provisions have also been made under Articles 350 A and 350 B to provide smaller communities educational opportunities in their mother tongue and to appoint a special officer for linguistic minorities:

Minority rights must also be considered in regional or local contexts. In some regions, such as autonomous minority regions, a particular linguistic minority may constitute the majority population and may have in place extensive provisions for the use of its language as the dominant language of the region in administration, education and service provision. In such cases it is important to ensure the language rights of those belonging to other communities who may find themselves de facto linguistic minorities in certain localities despite constituting a majority nationally.(Ishak Rita 2012:8). In districts where persons speaking such languages constitute at least $60 \%$ of the population are declared as co-official language in the state by the President(CMC, 1961); For the purpose of the implementation of Official Language(s) Act(s) of different states, the taluk is taken as a geographic territory to decide about whether a language is a minority language or not. If within a taluk a language spoken by more than $15 \%$ of the total population of the said taluk, that language is considered as a minority language in that context. The speakers of those languages enjoys the benefits like the use of their languages in public offices, issuing forms of public importance in minority language, service of officers who know minority languages in Public offices etc.

## Conclusion

Centralized language policies may give primacy to the dominant national language, while decentralized policies can be more effective in responding to minority and regional language usage patterns and local conditions. In order to reach the benefits constitutional provisions, judicial enactments an effective legal system open to all should be created. Language rights bring confidence to keep linguistic identity which in turn contributes social development of all language speakers in a community-

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# Micro Finance in Kerala: <br> Impact and Emerging Issues 

- Biju K.C.


# THE <br> MICROFINANCE REVIEW 

## Journal of the

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# Microfinance in Kerala: Impact and Emerging Issues 

\author{

- Biju K C*
}

This study figfilights the immense potentialities opened up by the microfinance programmes in Kerala and their ability to address poverty, exclusion and marginalisation tfirough women empowerment, social interaction and participatory development. Microfinance programme in Kerala has achieved remarka6le success in reacfing the poor and
6ringing banking services to their door-steps.

[^2]
#### Abstract

The study is an attempt to assess impact of micro. finance programme and its emerging issues. Microfinance programme in Kerala has achieved remarkable success in reaching the poor and bringing banking services to their door-steps. It has succeeded in making the poor economically active by way of raising their level of employment and income as well as the asset base. The econometric results indicate that a $10 \%$ increase in average borrowing by the beneficiary households from microfinance programme enhances household monthly income by $7.9 \%$, per capita monthly income by $2 \%$ and household per capita monthly total consumption expenditure by $1.3 \%$. The microfinance intervention has also become a vital channel for reducing under-nourishment and poverty and promoting human capital investment. The rate of poverty alleviation is significant through this programme as $27 \%$ of the beneficiary households feel themselves to be non-poor. This study, therefore, acknowledges the ability of microfinance.to promote economic and social development based on grass-root strategies. The emerging issues of microfinance identified by the study are categorised into four, namely, organisational problem, financial problem, production problem and marketing problem.


## Introduction

Poverty is the greatest development challenge in India. Exclusion of a large number of people from any access to formal financial services is one of the major reasons identified for high incidence of poverty in India. Access to finance by the poor, disadvantaged and underprivileged

[^3]group is a prerequisite of poverty alleviation, on one hand, and the economic growth on the other. Having access to credit facilitates liquidity constraints faced by the poor and provides capital to undertake some income generating activities that can boost employment, leading to the eradication of poverty. Thus, enabling poor to have access to financial services has been regarded as one of the most powerful weapons to bring them into the mainstream of development. Financial inclusion, therefore, has become key strategy for poverty alleviation in India.
Faster and more inclusive growth is now recognised as the key development paradigm. Financial inclusion is the most important tool for achieving inclusive growth. Financial inclusion, the delivery of banking services at an affordable cost to the vast sections of disadvantaged and low-income groups, is an effective instrument for making growth more inclusive.

Microfinance is a major route for promoting financial inclusion and inclusive growth. The group-based approach of microfinance facilitates the poor to accumulate capital by way of small savings and enables them to have easy access to formal credits for taking up income generating activities (IGAs). In Kerala, microfinance has emerged as a vital tool for poverty alleviation. There exists, side by side, microfinance programmes initiated by both the Government and the Non-Government Organisations (NGOs). They work along with the poor to find ways to alleviate poverty.
The relevance of this study lies in the fact that, though the microfinance programme made phenomenal strides in Kerala, no serious study has so far been undertaken in the state related to its poverty-alleviation potential. Further, this study attempts to unveil the various problems faced by the poor in participating in microfinance programme, in running their IGAs, and recommend suitable measures to overcome them.

## Review of Literature

Access to finance has been seen as a critical factor in enabling people to transform their production and employment activities. The non-targeted group members in the microfinance programme borrowed significantly larger amounts compared to targeted group members in terms of average loan size. Sex and occupation of the head of the family, presence of other credit delivering agencies, electrification, and duration of membership were the factors identified as the major determinants of the depth of participation (Zaman, 1996). The eligible households' participation was only $25 \%$ and that rates of participation were higher among the poorer. The study identified lack of female education, small household size, and landlessness, as the risk factors responsible for the non-participation in micro-credit programmes (Timothy, 1999).
The impact of group-lending on physical asset, saving, production, employment, expenditure on health care and education was insignificant due to small size of the loan. This in turn adversely impacted the ability of members to invest in income-generating
programme and forced them to use loan for consumption (Coleman, 1999). The participation in the microcredit programme created positive impact on both economic and social indicators of welfare as well as IGAs, especially for the very poor participants in the programme (Montgomery, 2006). The microfinance interventions helped in smoothing consumption and, to some extent, generating income of the participants. No significant difference between borrowers and non-borrowers was found with regard to the expenditure on education, health and also girls' schooling (Jamal, 2008). The Self-Help Group Bank Linkage Programme (SBLP) substantially improved the access to financial services of the rural poor, produced positive impact on their socio-economic conditions and reduced poverty of SHG members and their households. The participation in microfinance programme also empowered women members significantly and led to increased self-confidence and positive behavioural changes (NCAER, 2008).

## Objectives of the Study

1. To examine the depth of outreach and levels of participation of the poor in the microfinance programmes in Kerala and to identify the factors influencing their levels of participation.
2. To explore the impact of microfinance programmes upon the poor households in Kerala.
3. To identify the emerging issues of microfinance programmes in Kerala and to suggest measure to resolve them.

## Theoretical Framework

This study has been carried out within the theoretical framework of the Baker-Hopkin credit model (1969) which deals with the relationship between equity capital and credit. The access of credit will facilitate the poor people to take up productive investment which leads to an increase in their household income and accumulation of capital. The Baker-Hopkin credit model is based on the following equation:
where,

$$
G=\left[\left(\frac{\mathrm{D}}{\mathrm{E}}\right)(r-i)+r\right](1-c)
$$

$G=$ growth of the firm
$E=$ the amount of equity capital, i.e. the difference between the value of assets and loan
$D=$ the amount of loan
$r$ = the rate of return on assets
$i=$ the rate of interest paid on loans
$c=$ the rate of consumption out of the income earned from assets

As per this equation, as long as the return on assets ( ${ }^{\prime}$ ) Is greater than the rate of inter est paid on loans (i), credit will help to increase the income of the borrower who recelved the loan. The larger the share of loan to total capltal (D+E), the higher would be the growth of borrower's income. Marginal propensity to consume being less than one, the higher the borrower's income, the larger would be the borrower's caplal accumulation,

This increase in income will generate positive impact on socio-economie condition and living standard of the borrowing households. Many studies have found that credit is the binding constraint for the poor to get out of their poverty situation. Microfinance has emerged to alleviate this capital constraint of poor households by dellvering credit facilities to them for investing in productive enterprises and thereby enabling them to improve their livelihood and level of welfare.

## Methodology

The study is chiefly based on primary data collected from 375 randomly aelected households from Kottayam, Idukki and Wayanad districts of Kerala, where microfinance programmes are deeply rooted. The sample houscholds (375) consists of 180 Kudumbashree households, 120 NGO households, and 75 non-participant houscholds. Data collection was done using a pre-tested and structured interview schedule. Among the various NGOs, the best performing NGO has been selected from each district based on its commitment and involvement in microfinance programme. Accordingly, Changanassery Social Service Society (CHASS) from Kottayam, Peermedu Development Society (PDS) from Idukki and Shreyas from Wayanad, were chosen for the study.

The impact of microfinance was analyzed by comparing both the socio-economic conditions of the participant households before and after the microfinance intervention and also by comparing the participant households with the non-participant households. The study used econometric models to analyze the data. The level of participation in microfinance programme was investigated by using the econometric model adopted by pitt and Khandker (1998):

$$
\begin{equation*}
\mathrm{C}_{\mathrm{ij}}=\alpha_{\mathrm{c}} \mathrm{X}_{\mathrm{ij}}+\sum_{\mathrm{ijc}} \tag{1}
\end{equation*}
$$

where,
$\mathrm{C}_{\mathrm{ij}} \quad$ means the total amount of borrowings from microfinance programme.
$\mathrm{X}_{\mathrm{ij}} \quad$ is the vector of household characteristics such as age, level of education, caste, family size, Below Poverty Line (BPL)/Above Poverty Line (APL) family, women-headed family, and duration of participation in the microfinance programme.
$\alpha_{c} \quad$ is the unknown parameter.
$\Sigma_{i j c}$ means the random error.

Seven dummy variables are introduced in the regression model to represent the level of education and caste of the respondents. The four dummies representing the level of education are:

1. edudum 1 ( 1 to 4 years of schooling),
2. edudum 2 ( 5 to 10 years of schooling),
3. edudum 3 ( +2 /pre-degree), and
4. edudum 4 (Degree and above).

The caste of the respondents is given by:

1. scdum (Scheduled Caste/ Scheduled Tribe, SC/ST category),
2. obcdum (Other Backward Community, OBC category), and
3. gendum (General category).

The impact of microfinance programme on various outcomes is estimated by employ. ing the econometric model of Kondo et al. (2008):
$\underset{\text { Where, }}{\mathrm{Y}_{\mathrm{i}}}=\mathrm{F}\left[\beta_{1} \mathrm{X}_{\mathrm{ij}}+\beta_{2} \mathrm{M}_{\mathrm{ij}}+\beta_{3} \mathrm{~T}_{\mathrm{ij}}+\varepsilon_{\mathrm{ij}}\right]$
$\mathrm{Y}_{\mathrm{i}} \mathrm{X}_{\mathrm{ij}}$ is the household outcome of interest
is the vector of household characteristics namely age, level of education, caste, family size, BPL family and women-headed family $M_{i j}$ is the membership dummy; 1 , if participant household; o, otherwise $\beta_{1}, \beta_{2}$, and $\beta_{3}$ are unknown parameters $\mathrm{T}_{\mathrm{ij}}$ means the treatment variable
Three treatment variables are used to welfare. They are:
(a) Take up programme loan ( $1=$ yes, $\mathrm{o}=$ otherwise)
(b) Duration of participation
(c) Average borrowing per year of membership

The impact of microfinance intervention is estimated with reference to the following outcome variables ( $Y_{\mathrm{ij}}$ ), which are employed as dependent variables in the above impact ousehold monthly income and
(ii) Per capita total monthly con

Microfinance has evolved as a key strategy of poverty alleviation in Kerala. Both state government and NGOs have been actively involved in the promotion and growth NGOs in other parts of the world inste. The success of microfinance interventions of finance programme even before the inspired many NGOs in the state to launch microbefore the entry of the state government in the programme.

They aimed at the socio-economic upliftment of the poor through provision of credit. Hence, NGOs act both as facilitators and a connecting link between SHGs and banks. They organise the poor into SHGs, undertake capacity building programmes for them and equip them to initiate IGAs to pull them out of poverty. They play a crucial role in popularising and spreading microfinance programme throughout the state.

The Government of Kerala launched a microfinance programme called 'Kudumbashree' (Prosperity of the Family) in 1998, with the active support of Government of India and National Bank for Agriculture and Rural Development (NABARD) for alleviating all forms of poverty from the state within a period of ten years. Kudumbashree is a participatory, women-oriented, poverty eradication programme, implemented by the State Poverty Eradication Mission. It identifies the poor and organises them into a community based organisations with the help of local self-governments. This programme seeks to achieve overall development of the poor families through self-help, people's participation and group action. This programme is highly acclaimed at national and international levels as the best and workable participatory poverty-reduction model.

Kudumbashree is a three-tier community-based organisation with National Health Groups (NHGs) at the grass root level, Area Development Society (ADS) at the ward level and Community Development Society (CDS) at the Panchayat level. The aspirations of the poor along with their genuine demands voiced out in the NHG meeting constitute the 'Micro Plan' and they are scrutinised and prioritised to form a 'Mini Plan' at the ADS level. The 'CDS Plan' is prepared after consolidating the mini plans of the ADSs by judicious prioritisation process at the CDS level. The CDS Plan becomes the "anti-poverty sub-plan" of the local self-government. By 2001, the programme was implemented in all Grama Panchayats and later to all urban local self-governments of the state. Kudumbashree is today one of the largest women-empowering projects in the country. The programme has 41 lakh members and covers more than $50 \%$ of the households in Kerala.

Kudumbashree functions as sub-system of local self-governments and acts as convergence of activities of several departments at the local level. Therefore, it undertakes a wide range of activities and programmes for the socio-economic empowerment of the poor women. Thrift and credit societies, linkage banking, lease land farming and group farming, individual and group micro enterprises, etc., are some of the major initiatives taken up by it to improve the livelihood of the poor. Kudumbashree has been actively participating in the implementation of various poverty alleviation programmes and socio-economic developmental programmes of local self-governments and government departments. It also oversees and monitors the implementation of Mahatma Gandhi National Rural Employment Guarantee (MGNREG) Scheme and other major centrally sponsored urban poverty alleviation programmes, namely, Swarna Jayanthi Shahari Rozgar Yojana (SJSRY), Integrated Housing and Slum Development Programme (IHSDP) and basic services to the urban poor.

Thus, the participatory and group approach of Kudumbashree and its multi-faceted for their socio-economic empowerment.

## Impact of Microfinance in Kerala: Findings

Depth of Outreach of Microfinance Programme
Outreach of microfinance programme signifies the number of persons now served by the microfinance programme who were previously denied access to formal financial services. Under the depth of outreach, the study examines the ability of microfinance pro. grammes to reach various economic and social sections of the society. The study finds that the majority of the participant households did not have access to formal banking services in the pre-microfinance period. It is also evident that SC/ST and OBC families constitute half of the microfinance clients, reflecting the active participation of weaker sections of the society in the programme. The ability of microfinance programme to reach the poor is apparent as all the participant households belonged to BPL category before the intervention of microfinance programme.

## Determinants of Participation in Microfinance Programme

The extent of participation by members in the microfinance programme is represented by the cumulative amount of borrowings availed from microfinance programme. The variables such as age and caste of the client, BPL family and duration of participation are found to be significant among the various determinants of the level of participation of the clients in the microfinance programme. The regression coefficient of age turned out to be negative reflecting that the higher age of clients reduced total borrowings from microfinance programme. The caste of the participants SC/ST (scdum) and OBC (obcdue volume of their borrowings. The borrowings of households are substantially less than those of the households belonging to general category. The borrowing of the BPL family is less than the APL family. It signifies that the economically better-off clients derived greater benefits from the programme. Finally, a one year increase in the participation of micro-
finance programme total borrowing from enhanced the by Rs. 7,569 (Table 1).

Table 1: Determinants of Participation in Microfinance Programme
Explanatory Variables Regression T'value Significaxe

|  | Co-efficient |  |  |
| :--- | ---: | ---: | ---: |
| Constant | 101317.3 | 5.164 | .000 |
| Age | -554.8 | -2.027 | .043 |
| edudum1 | -4620.9 | -.342 | .733 |
| edudum2 | -6789.1 | -.541 | .589 |
| edudum3 | -287.3 | -.022 | .983 |
| scdum | -39197.3 | -5.534 | .000 |
| obcdum | -27590.9 | -5.464 | .000 |
| BPL family | -25380.9 | -4.608 | .000 |
| Family size | -1885.6 | -1.019 | .309 |
| Women-headed family | 1000.5 | .155 | .877 |
| Duration of participation 7568.6 | 12.497 | .000 |  |
| $R^{2}$ | .591 |  |  |
| No. of observations |  | 300 |  |
| Source: Primary data. |  |  |  |

## Savings in SHGs/NHGs

All the participant members have some savings in their respective groups. Nearly $65 \%$ of the participant members have savings of more than Rs. 5,000 in their groups. The majority of the members ( $39.3 \%$ ) are reported to have weekly savings of Rs. 10 to Rs. 20 . An overwhelming majority of the members ( $86.7 \%$ ) found their weekly saving fund out of their earnings.

## Borrowing from Microfinance

The clients can avail themselves of mainly three sources of loans, namely thrift loan disbursed out of the pooled savings of the group, bank linkage loan and loan taken from banks for undertaking IGAs. All microfinance clients made use of both thrift and IGA loans. Among the borrowers, the highest number of them have taken loans in the range of Rs. $20,001-40,000$ from all the above three sources. The average household loan per year of the microfinance clients is estimated to be Rs. 11,751. The average number of loans taken by the participant household is 13 .

However, there are some clients who have not yet obtained bank linkage loan on account of the failure of their groups to fulfil the eligibility conditions put forward by NABARD for linkage loan. The vast majority of them belong to the Kudumbashree group. The interest rates imposed on microfinance loans ranged between 5 to $13 \%$ per annum. The interest rate on thrift loan is $12 \%$ both for the NGOs and Kudumbashree borrowers.

There is a drastic change in the borrowing pattern of the participant households during the post-microfinance period where SHGs/NHGs became major source of borrowing. In the pre-microfinance period, money-lender was the principal source of borrowing and now their dependence on money-lenders has been eliminated almost completely.

More than half of the clients utilised both thrift and linkage loans for productive purposes. The IGAs undertaken by the clients are grouped into four namely, agriculture, animal husbandry, manufacturing and service. Majority of the clients ( $46.7 \%$ ) are engaged in animal husbandry followed by manufacturing ( $23.7 \%$ ). The number of clients working in the agriculture is the lowest with $11 \%$. Unproductive use of thrift and linkage loans is quite high ( $67.2 \%$ ) among the members of the Kudumbashree group. Chi-square test was employed to test the association between taking productive loans and microfinance type. The value of chi-square statistic is 68.986 which is significant at $1 \%$ level of significance. Hence, taking productive loans and microfinance type are associated. Nearly $95 \%$ of the clients made prompt repayment of their loans availed. A default on the repayment of loans was reported to be the highest among the Kudumbashree clients.

## Impact of Microfinance Programme on Households

The impact of microfinance programme is assessed by comparing the living conditions of participant households with non-participant households and also by a com- pre and post microfinance situations. The study also fitted a multiple regression model Employment
The major objective of the microfinance programme is to create employment for the poor and the weaker sections of the society by empowering them to take up economic activities. It views IGAs as opportunities for providing gainful employment to the poor by which they can improve their income and standard of living. Majority of the micro. finance participants (63.3\%) were unemployed during the pre-microfinance period. However, in the post-microfinance period, all of them could find some employment. The employment generation capacity of microfinance is more evident as more than half of the non-participants ( $53.3 \%$ ) have no employment at all. As much as $81 \%$ of the participant clients got employment for more than 21 days in a month (Table 2).


## Household Income

Microfinance aims at helping the poor to achieve greater levels of income by starting economic activities mainly through the provision of credit. The extent of income generation relies upon the type of the activity undertaken and its market potential.
More than $40 \%$ of the participan However, an overwhelming majority of holds have monthly income of above Rs. 4,000. than Rs. 2,000 per month. The positive impact household monthly borrowing per year average amount of borrowing per year, indicating client by $7.9 \%$ and per capita monthly income by

2\%. Moreover, the clients with higher education are likely to contribute more to their household income compared to the clients having less education. The APL households are predicted to have Rs. 3,400 more monthly income compared to the BPL households (Table 3).

## Consumption

The food intake of majority of the households of microfinance clients has been more than three times per day. It is very low in the case of nonparticipant households. The benefit of microfinance intervention became more evident as $15 \%$ of the participating households were able to access only two square meals per day in the pre-microfinance period and nobody was found in this category during the post-microfinance period.

The regression estimates show that variables such as average borrowing per year, microfinance participation, age, edudum 1 ( 1 to 4 years of schooling), edudum 2 ( 5 to 10 years of schooling), BPL family, and family size are found to be significant. The findings indicate that per capita monthly total consumption expenditure of the participant household is greater by Rs. 376 in comparison with the non-participant household. Positive and significant regression co-efficient has been found for family size. This implies that as family size increases by one unit, per capita monthly consumption expenditure of household is expected to rise by Rs. 180 . The value of regression co-efficient also indicated that an increase of average borrowing per year by $10 \%$ will lead to a $1.3 \%$ rise in the per capita monthly total consumption expenditure of the participant household (Table 4).

Microfinance programme inculcated a habit of regular savings among its clients. All the participant households have some savings in the post microfinance period, while almost $99 \%$ of them had no savings in the pre-microfinance period. The average total savings of the participant household is Rs. 20,380. More than $62 \%$ of the clients have savings in post office or chitty or both, apart from the savings in SHGs/NHGs. The positive role of microfinance programme in the promotion of savings is more visible as the number of the non-participant households with savings is substantially low with $6.7 \%$. There is a significant increase in the number of clients with insurance policy ( $51.3 \%$ ) during the post microfinance period and majority of them have the policy amount of above Rs. 25,000 . Among the non-participants only $4 \%$ of them have insurance policy.

## Acquisition of Assets

Microfinance programme is intended to strengthen the asset base of its clients. The possession of durable assets and livestock enhances the livelihood resource base of the poor households. The participation in microfinance programme enables its members to acquire various assets namely livestock (cow, goat and pig), gold, and consumer durables such as television, mixer, electric iron, gas stove, sewing machine, refrigerator, CD/ DVD player, furniture etc., by using both the earnings from their economic activities and availing themselves of loans from their group. The asset holdings of participant households enhanced significantly. Majority of the clients acquired various assets such as livestock ( $46.7 \%$ ), gold and jewellery ( $45 \%$ ) and various consumer durables

| Table 5: Assets Acquired through Microfinance |  |  |  |
| :--- | ---: | ---: | ---: |
|  | No.of |  | Households Acquired Assets |
|  | NGO | Kudumbashree | Total |
| No asset | 7 | 20 | 27 |
|  | $(5.8 \%)$ | $(11.1 \%)$ | $(9 \%)$ |
| Livestock | 61 | 79 | 140 |
|  | $(50.83 \%)$ | $43.89 \%)$ | $(46.67 \%)$ |
| Gold jewellery | 47 | 88 | 135 |
|  | $(39.17 \%)$ | $(48.89 \%)$ | $(45 \%)$ |
| Consumer durables | 87 | 117 | 204 |
|  | $(72.5 \%)$ | $(65 \%)$ | $(68 \%)$ |
| S |  |  |  | (68\%) (Table 5) Furt participant house Poverty

The ultimate goal of microfinance is to empower the poor by providing them collat eral free loans so that they can generate productive self-employment by organising economic enterprises. In conformity with this, the present study finds that microfinance has contributed to alleviation of poverty this, the present study finds that microfinance has approaches have been used poverty substantially. The subjective and objective poverty holds. The objective pover to determine the poverty status of the participant houseof the state BPL list by corty status of participating households is examined on the basis the state BPL list before and aft as to how many of the participating households are in poverty status of households is joining the microfinance programme. The subjective determined on the basis of the answers of respondent ${ }^{t}$
in response to a question - "Do you consider your family as BPL on the basis of current annual income?" The answer of the respondents would be either "yes' or 'no'. Dubnoff, et al. (1981) also employed this type of approach to determine the poverty status of households.
The results of both techniques indicate that the incidence of poverty among participating households is significantly less than that of non-participant households. All participant households were in the state BPL list before joining the microfinance programme. However, in the post-microfinance period, $22 \%$ of participating households could come out of the poverty trap owing to microfinance intervention (Table 6). Hence, it indicates that microfinance programme contributes to poverty reduction.

The subjective poverty estimate has revealed that $27 \%$ of participant families are APL (Table 7). As much as $27 \%$ of families among participants felt APL, whereas all non-participants families felt BPL. Kudumbashree has dominance in the proportion of participant households feeling APL and number of households who turned into APL as per state poverty estimate.

## Children's Education

| Category | No.of Households |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Pre-Microfinance Period | Post-Microfinance Period |  |  |
|  |  | NGO | Kudumbashree | Total |
| BPL | 300 | 97 | 137 | 234 |
|  | (100\%) | (80.8\%) | (76.1\%) | (78\%) |
| APL | Nil | 23 | 43 | 66 |
|  |  | (19.2\%) | (23.9\%) | (22\%) |
| Total | 300 | 120 | 180 | 300 |
|  | (100\%) | (100\%) | (100\%) | (100\%) |


| Table 7: Subjective Poverty Status of Sample Households |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: |
| Category | No.of Households |  |  |  |
|  | NGO | Kudumbashree | Total | Non-Participant |
| Feel APL | 28 | 53 | 81 | Nil |
|  | $(23.3 \%)$ | $(29.4 \%)$ | $(27 \%)$ |  |
| Feel BPL | 92 | 127 | 219 | 75 |
|  | $(76.7 \%)$ | $(70.6 \%)$ | $(73 \%)$ | $(100 \%)$ |
| Total | 120 | 180 | 300 | 75 |
|  | $(100 \%)$ | $(100 \%)$ | $(100 \%)$ | $(100 \%)$ |
| Source: Primary data. |  |  |  |  |

The new income from the economic activity enables microfinance clients to provide quality education to their children. It facilitates them to send their children to good schools and also enables them to provide higher education, better study aid and more facilities to their children. The microfinance intervention helped $79 \%$ of the clients to provide better education to their children. The conclusion derived from two sample ' 't' test was that the monthly mean expenditure on children's education is significantly higher in the case of families participating in microfinance programmes than non-participant households. It signifies that microfinance programmes enhance entitlement of clients on education through raising capability to spend more on the education of their children.

## Health

Households of microfinance clients seem to have better nutrition, health practices and health outcomes with the help of increased earnings and provision of health education by the microfinance organisation. All participant households made improvement
in health care expecially by prompt treament of healith problems in gras frosytalc. There is also substantial improvemest in the matrition level of aborat $927 \%$ of Irrise, holds of mictofinance dients. Almost $89 \%$ of paricipant cherts truk theiced trex ment from quvernment hospitals in the pre mictofinance period, where metical wast. ment was free. In the post-micorofinance period an orerwhelming maisrity of olefur ( $6.7 \%$ ) availed themselves of medical treament from private hospitals, where whe fans get beter medical treatment. In contrast, most of nom-participart howsehoies (He 2 wh rely on government hospitals for modical treatment. The t-test resulf shows that patiss pant houscholds spend siznificanty higher amount of money on heaith cere than most participant households.

## Emerging Issues of Microfinance Programme in Kerala

The study idenified four major categories of problems conffromed by the cient while participating in the microfinance programme and in running their IGtis Ther as organisational problem, financial problem, production problem, and markeing projiem (Table 8).
The major organisational problems faced by the clients are lact of encruas ment to IGAs and poor monitoring and follow-ip action, followed by polimemon in the programme. All organisational problems except that of the lack of encouragementtoIGAs are more acute in Kudumbashree groups than in the NGO groups of three districts. The politicisation of the programme is prevalent only in Kudumbashree group. Drop-out and lack of co-operation and unity among members are also more prevalent in Kudumbashree group.
Among the various financial by clients are hajor problems cited loans and low interest rate on from activities income-generation Insufficient financial anden (Table 9). subsidy, high interest assistance and low income-generst rate on loans and more acute among the NGO IGAs are The analysis of produc groups. shows that high of prost of prodion problem

| Table zo Organisational Prubiens |  |  |
| :---: | :---: | :---: |
| Tpectifublem | Te.jJent |  |
| WSD | Funuterile | Tr |
| Politicisation Nal | 55 | $\Sigma$ |
|  | (30.5n) | (1330) |
| Drop out 5 | 32 | 5 |
| (42\%) | (17848) | (1235) |
| Lack of Co-operation and 13 | 35 | 45 |
| unity among members (10.8\%) | (19.4*) | (45723) |
| Lack of encouragemert to IGA50 | $\div 1$ | \% |
| Poormonitorn (50\%) | (22846) | 35, ${ }^{\text {cos }}$ |
| follow-up moning and 26 | 73 | 35 |
| Source Primary data (21.73) | ( 30.54 ) | , |
| Table It Fmancial Problens |  |  |
|  | Naviders |  |
| Insufficient finarial | Sutumbance |  |
| assistance and subial 90 | 100 |  |
| High interest subsiciy (75.03\%) | (55.60) | 6330 |
| rate on loan 83 | 151 | $\cdots$ |
| (69.24i) | (50.50) | 185 |
| 15 | 40 | $0-50$ |
| Low income (125\%) | (22,20) | (120) ${ }^{3}$ |
| fromlGA generation 87 | 109 |  |
| Problem in repeym (72.5\%) | (00.6*) |  |
| ( ${ }^{\text {a }}$ ( 9 | 19 | \% |
| cei Primary data (75\%) | (10.60) |  |

the main problem of clients of both groups (Table 10). The proportion of clients facing production problems is found to be more in the Kudumbashree groups than in the NGO groups. High cost of production and difficulty in getting raw materials are the major problems common to Kudumbashree groups.

The major marketing problem is the lack of demand for products manufactured, followed by the lack of market information (Table 11). The marketing problems are noticeable in the Kudumbashree groups compared to the NGO groups. Kudumbashree groups by and large face all problems of marketing.

## Recommendations

Both Kudumbashree and NGO

Table 10: Production Problems

| Table 10: Production Problems |  |  |  |
| :--- | ---: | ---: | ---: |
| Type of Problem | No.of Clients |  |  |
| Inadequate production | 18 | Kudumbashree | Total |
|  | $(15 \%)$ | 31 | 49 |
| High cost of production | 41 | $6.2 \%)$ | $(16.3 \%)$ |
|  | $(34.2 \%)$ | $(42.2 \%)$ | 117 |
| Difficulty in getting | 12 | 32 | $49.0 \%)$ |
| raw materials | $(10.0 \%)$ | $(17.8 \%)$ | $(14.7 \%)$ |
| Lack of training | 19 | 28 | 47 |
|  | $(15.8 \%)$ | $(15.6 \%)$ | $(15.7 \%)$ |
| Source: Primary data. |  |  |  |

Table 11: Marketing Problems

| Table 11: Marketing Problems |  |  |  |
| :--- | ---: | ---: | ---: |
| Type of Problem | No.of Clients |  |  |
|  | NGO | KDS | Total |
| Lack of market Information | 19 | 35 | 54 |
|  | $(15.8 \%)$ | $(19.4 \%)$ | $(18 \%)$ |
| Competition | 13 | 33 | 46 |
|  | $(10.8 \%)$ | $(18.3 \%)$ | $(15.3 \%)$ |
| Lack of demand for | 20 | 48 | 68 |
| the product produced | $(11.7 \%)$ | $(26.7 \%)$ | $(22.7 \%)$ |
| Inadequate transportation | 11 | 24 | 35 |
| facilities | $(9.2 \%)$ | $(13.3 \%)$ | $(11.7 \%)$ |
| Involvement of middle men | 7 | 10 | 17 |
|  | $(5.8 \%)$ | $(5.6 \%)$ | $(5.7 \%)$ |
| Source: Primary data. |  |  |  | groups should extend further their depth of outreach to the poor and vulnerable sections of the society since $\mathrm{SC} / \mathrm{ST}$ and OBC families still remain among non-participant groups.

There is a need for a strict monitoring-mechanism under the microfinance programme to reap better results. Regular internal monitoring by the group, ADS and CDS members and external monitoring by banks and promoting agencies at the district/regional level would ensure proper utilisation of the loan and flowing of benefits to deserving clients as per stipulated norms of each scheme. It would also help the IGA units to tide over their temporary difficulties and to sustain the initial increase in income over a long period of time. Moreover, a tight monitoring system can improve the recovery of loans, promote unity and co-operation among clients by settling their conflicts and reduce the drop-outs.

The State Kudumbashree Mission and NGOs should evolve some products and services catering to the needs of the core and the moderate poor for deriving greater benefits by them.

The political interventions under the Kudumbashree programme create adverse impact on the smooth operations of the programme and also in achieving its professed goals. Hence, the State Kudumbashree Mission must take positive steps to free Kudumbashree
from politisution by framing and administering strict objecture criteria tor the telection of beneficiaries for various schemes as well as in distbursing finaroial assiatarxe sur. aher bestits.
More training programmes should be organised to raise the arvareness level of chenes on trinical korn-bon, conwmer preferences, marketing of products and for widening sotils of clients and their upgradation which will result in the better management of Giss asio zeneration of more income.
Nam 1GAs undertaken by the clients are not remunerative and hence they are on the werge of closure. Therefore, state government and boal level bodes and licon tonald take serious efforts to enhance their eamings by providing suppoting faciltee sxin as manceing oppotunitiss, ready arailability of rarn-materials and strentheming wonitroing mechanivm.
The State Kacumbashree Mission and NGOS must encouraze the clienss to trelise thrift and linkaze loans for productive purposes in order to facilitate easy and prompt
The debslability of participating howseholds is increasing alarmingly, Morerver, some of the diens have dual or multiple memberships in various microfinance programemes promoted by commural cutits and NOOS and also made use of these sources for bro roning These trends may pose serious problem in the near future with revpeut to the reperment of han and can beocme a great social isvue. Hence, there is a need for cor ordination among various microfinance groups in order to put some cesiling on the wor une of borroring from various SHGs. Further, state govermment should take newn? mecaurs to control the muliple memberships.
Hfgiturecestrate of the ban given to the poor und micr than
a casse of oncern. Therefore, grvennment and under microfinance programme is also st bearing loass to chents which wouli mand NGOs should make available low itser reduce their tepermett burden. Would make the enterprives more remunerative and State groemments, local level bodies and NGOS should ensure ample marker for the $b_{y}$ making departmental purchases fro product. State government can support cienss Farket their products thaughases from these enterprises and can provide avemues op lease land cients. Lrase land farming and
 scieme in the cien oclabsration with large area of uncultivated land in the state. Hence sent it throwghicultural Department should eroife a help of 'Krishi Bhavan'?

## Conclusion

This study highlights the immense potentialities opened up by the microfinance programmes in Kerala and their ability to address poverty, exclusion and marginalisation through women empowerment, social interaction and participatory development. However, microfinance can serve as a still better instrument of poverty alleviation and of promoting household welfare if the state government and NGOs focus greater attention to widen economically viable self-employment choices and skill base of clients, to assist clients in getting low interest-bearing loans and in improving quality of their products. Otherwise, the potential benefits of microfinance cannot be realised on a sustainable basis.

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# A historical survey of the local rulers of the Poonjar 

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# A Historical Survey of the Local Rulers of Poonjar 

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#### Abstract

After the fall of the Perumals of Mahodayapuram, Kerala was politically fragmented into many kingdoms and chiefdoms. Due to the political fragmentation and lack of a central authority many local chiefs and lesser rajas emerged. Poonjar was one among such chiefdoms. The rajas of Poonjar were believed to be the descendants of the Pandyas of Madurai. On account of continuous internal and external strives they had to flee from their homeland to Kerala where they purchased land from the rulers of Thekkumkur and lesser rajas of adjacent areas. With its annexation to Travancore by Marthanda Varma, the kingdom of Poonjar ceased to exist. The uniqueness of the Kingdom of Poonjar was that the kingdom was founded by not waging wars but by the purchase of land and that it was maintained with the help of the local aristocrats from various religious communities without the help of a standing army.


## INTRODUCTION

The fall of the Perumals of Mahodayapuram in the beginning of the 12th Century AD, is a landmark in the history of Kerala. With this fall, Malabar (Present day Kerala) was politically fragmented into many small kingdoms under various local rulers. Various swaroopams, Kaimals and Naduvazhis took political power of the various localities. It remained so until the 20th century when the modern Kerala was formed. With the political disintegration of the twelfth century there occurred a lot of changes in the society, economy, culture and polity of Malabar. As a result of this political fragmentation due to the lack of a strong central authority, Malabar became an easily vulnerable area which attracted many aspiring with political dreams. Some of the rulers depending on their military power and influence extended their kingdoms and influence, created petty kingdoms and became powerful whereas some were groping in the dark.

Taking into account this chaotic backdrop in Malabar, some of the rulers reached Malabar. Poonjar rulers were one among them. The kingdom of Poonjar was located on the Western Ghats in the hilly regions of Malabar. The area of the kingdom varied from time to time but during its zenith extended to areas East of Ampara, West of Dindugal comprising of areas up to Mangaladevi in the South and Munnar in the North totally comprising of an area of 4000 square mile. All these areas were in the remotest and hilly parts of Malabar that it did not have much external contacts due to its geographical position. As the kingdom did not have any sea ports, it did not have any foreign contacts also. As a result of this we do not find many references about Poonjar in the foreign sources. For example from among many Portuguese visitors only Jornada do Arcebispo mentions about the kingdom of Poonjar.

The rulers of Poonjar are claimed to be the descendants of the Pandya dynasty of the Tamil Country. They had to flee from their homeland on account of various factors. One of the reasons for
their Diaspora was the defeat they had to face at the hands of the Cholas.
There are certain factors which show their Pandya ancestry. This dynasty even now prepares Pongal which is a unique custom of Tamilnadu. Yet another evidence of the Tamil origin is the Meenakshi temple of Poonjar. In commemoration of the Meenakshi temple of Madurai, the Poonjar Rajas built a temple dedicated to the Meenakshi of Madurai close to their palace. It was from this connection that the river flowing through Poonjar was named as the River Meenachil which was a derivative of Meenakshi. The Devi idol of Poonjar is a Thevaram. It means that the Pandya rulers under Manavikrama during their exodus carried along with them the Thevarm of Meenakshi Devi along with them. Yet another evidence for their Pandya connection is the official royal seal and signature of the kings of Poonjar which inscribes Madhura Meenakshi Thuna (Madurai Meenakshi is the help). Still another evidence of the Pandya connection of the rulers of Poonjar is the existence of Karyalas who were appointed by the Raja of Poonjar in the Pandya Mandala. The descendants of these Karayalas are there in Pandyamandalam even today. In addition to that there is a special pooja in the Meenakshi temple at Madurai on the Chithrapournami of Kanni month for the well-being of the Kulasekhara Perumal and his descendants.

The architectural style of the royal palace and the Meenakshi temple also portrays the Pandya connection. A close study of the pillars and the decorations on the sealing of the present royal palace also will reveal Pandya architectural style.

There are so many people, in the Gudallur area of Tamilnadu where the Pandyas during their Diaspora had a sojourn, who even now obey them. A few years back also a few people from Gudallur area came for the blessings of the Raja of Poonjar so that they could get good rains in their area. All the above factors point to the fact that the Rajas of Poonjar were the descendants of the Pandya dynasty of Tamilnadu.

The circumstances that led to the fleeing of the Pandya Royal family and their acculturation in Malabar are worth-mentioning. The Poonjar Royal family is believed to be the descendants of the Pandyas who migrated to Malabar under the leadership of Mana Vikrama Kulasekhara Perumal due to the incessant onslaughts in their homeland. Mana Vikrama who was defeated by the Chola kings, entrusted his kingdom to his brother Maravarman Sreevallabhan and left Madurai for Gudallur where he lived for quite sometime. Gudallur was made the capital of the territory comprising of areas between Periyakulam and Gudallur. Manvikraman, when he left Madurai had taken along with him the royal treasury also. Manavikraman might have the idea that the money could be used for buying land in Malabar.

There are two traditions regarding the route and manner that the Pandya rulers reached Malabar. From Gudallur, according to a tradition, they wandered through Northern Kerala and at last reached the Raja of Edappaly who was very generous to help him. According to the tradition of the Poonjar royal family, they reached the Raja of Thekkumkur through the miraculous intercession of the Goddesses Meenakshi. The journey was through Kumaly, Vandiperiyar, Nallathanni, Kolahalamedu, Adukkam, Erattupetta, Palai, Kidangoor, Ettumanoor from where they proceeded to meet the Raja of Thekkumkur. Though we do not have any clear evidence as to the date of this migration, it is believed to have taken place in 1189 A.D. ( 364 K.E). The latter tradition seems to be more reliable. For, the passage to Malabar through the hilly regions of was easier than crossing over to Northern Malabar from Gudallur. In addition to that there is tradition about the existence of a mountainous route to Tamilnadu through the High Ranges of Kerala.

According to the former tradition, after reaching Malabar, they wandered for quite some time enjoying the hospitality from various Rajas and Namboothiris. Later on they reached Edappalli, where Kulasekhara and his wife passed away entrusting their family members and kith and kin to the care and protection of the Raja of Edappally. The King of Edappaly helped them to settle down in an island of Cochin.

Due to their interaction with the Malabar culture and the subsequent acculturation, these kings

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gave up many of their Tamil cultural traits and adopted Kerala way of life. They adopted upanayana, Talikettukalyanam etc. Another important area which underwent change in their socio-cultural life is the mode of succession. The Pandya kings of Tamilnadu were following patriarchal system. Later on, in course of time, following the customs of the land, they also adopted the matrilineal system.

They tried to increase their influence in Malabar through marriage alliances. There is reference to the marriage of one of the princesses of this dynasty with the Raja of Edappilly according to the laws and customs of sambandham. But after the death of the Raja, the new chief was unfriendly to her which in its turn led to her southward journey along with the members of her family.

During their movement towards the south, they reached Vadakkumkur where they found favour with the Neyatttasseri Namboothiri and through him with the Vadkkumkur royal family. The Neyyattasseri Namboothiris became the patron of these fortune seekers.

During the sojourn of Kulasekhara Perumal in Vadakkumkur, they got the news that the Poonjar area was available for purchase. Those areas were under the suzerainty of the Raja Tekkumkur. As was the custom in Malabar, a few Brhamins were sent as intermediaries by the Perumal to discuss the issue with the Raja of Tekkumkur. The matter was discussed by the people of the area who did not have any objection on this issue. The ministers of Thekkumkur and the Poonjar chief met subsequently to discuss the proposed deal and settled the terms of the transfer. Later on at a meeting of the Rajas of Thekkumkur and Poonjar, the territory of Poonjar was formally transferred to Manavikrama Kulasekhara Perumal with all rights and dignities and the transfer deed was engraved on a copper plate. A few important dignitaries like the Raja of Edappilly and some influential namboodiris were there to witness the deed. The coronation of the Poonjar Raja was subsequently done in Poonjar in the presence of the Raja of Thekkumkur.

With a view to extending the kingdom, they purchased land from various lesser Rajas and chieftains like Thekkumkur, Erathodu Kaimal, Thazhathodu Kaimal, Arathott Kaimal etal.at various stages. Anjunadu and Kannan Devan Hill were acquired from the Keezhmalai Nadu in 1252. Thus with the purchase of Manjappara Hills from the Chengamanad Devaswom the kingdom was extended up to the Tamil region so as to get the area from Periyakulam to the boarders of Thekkumkur as an uninterrupted political unit. Thus by 1425, the Poonjar kingdom reached its zenith.

Later on there said to have been a crisis in the Poonjar royal family. The original pandyan line of the royal family became extinct. As a result, the chiefs of Poonjar adopted the head of the Sarkara Kovilakom (A branch of the Cranganore Royal family) with the concurrence of the Raja of Thekkumkur.

By $18^{\text {th }}$ century, the Poonjar territory began to shrink due to various attacks. In 1758, Hyder Ali attacked the Pandyamandalam and captured places like Periyakulam, Theni, Cumbum fort etc. But with the help of Karthikathirunal of Travancore, those areas were recaptured. But Hyder Ali attacked again and conquered the Pandyamandalam up to Mangala Devi and even destroyed the Temple at Mangala Devi. As the king of Poonjar did not have a strong army, he had no other means than entering into an agreement with Hyder Ali. According to this agreement he gave back seven villages including Chiramanaloor, Panniyoor, and Gudallur.

Following the death of Hyder Ali, Tippu Sultan attacked Pandyamandalam again. Joined with Travancore, the King of Poonjar took all precautions to face the attack of Tippu through Kumily side. When Tippu found that there was resistance he opted to pass to Malabar through the North. It has been said that the Poonjar and Travancore joined hands again to devise plans against Tippu. According to the tradition of the Poonjar royal family, the flood in the Periyar due to which Tippu had to regress was the creation of the above designs. It is said that the flood was due to the deliberate breaking of the Bhuthathankettu which was in the Kingdom of Poonjar. It was considered as a carefully designed project of Travancore and Poonjar. Thus the threat of Tippu was averted.

But slowly the Pandymandalam of the Poonjar Raja were captured by the British and the British

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were not ready to accept the ownership of the Raja of Poonjar over those areas. The Poonjar principality remained as a separate entity until the period of Marthanda Varma. Following the annexation of Vadakkumkur and Thekkumkur ( $1^{\mathrm{T}} 49-51$ ) Poonjar was also annexed to Travancore. By 1816, Poonjar was reduced to a chieftain under the Raja of Travancore. However, large tracts of lands in the High Ranges which the Raja of Poonjar had acquired in the fifteenth century, from Peermedu to Devikulam were under the possession of the Raja of Poonjar. It was from the Poonjar Raja that the English planters obtained large tracts in High Ranges for tea cultivation. The origin of the Kannan Devan Hill Plantation traces back to the agreement concluded between the Kerala Varma Valia Raja of Poonjar and John Daniel Monroe on July 11,1877. By 1900, Poonjar kingdom had become an edavaka only with 87 square mile. By 1957 these edavaka also disappeared.

We do not get a genealogy of the Poonjar rulers as there are no mentions in the documents and deeds of the dynasty. Instead of the names, the deeds were signed with the traditional title of the king, that is, Poonjarudaya Kulasekhara Perumal Pandrakaryam.

Though Poonjar was an independent kingdom, the suzerainty of the Raja of Thekkumkur was accepted by the rulers of Poonjar. For there are references to the permission obtained from the Raja of Thekkumkur by the Poonjar royal family on the occasion of the adoption of a heir from the Sarkara Kovilakom due to the extinction of a heir in Poonjar family.

There was a council to advise the Raja on day-to-day affairs. In the council consisting of the influential people of the area the councillors were appointed irrespective of the religion. There is mention of a St. Thomas Christian in the council of the Raja of Poonjar during the sixteenth century. He was quite influential too.

There was no freedom of religious conversions in Poonjar. Conversions were allowed only with the permission of the Raja of Poonjar who did not concede them easily. If it was not done with the prior permission of the Raja, their property could be confiscated. This was the general custom in Malabar during the medieval period. The Jornada do Arcebispo says that when the Portuguese wanted the conversion of the Malayarayas who were in the kingdom of Poonjar, they wanted the permission of the Raja of Poonjar in an ola lest the property of the converted should be confiscated by the king. To get the permission the Portuguese sought the help of the above mentioned influential St. Thomas Christian in the Council of the Raja.

But this does not mean that the Rajas of Poonjar were intolerant to other religions. We find that the permission of the Raja was essential for building churches or other worshipping centres in the kingdom. They granted this permission abundantly. The land for building many Christian Churches including Poonj ar was given by the Rajas of Poonjar.

One of the specialities of the kingdom of Poonjar was that it did not have a standing army till the later period of the dynasty. Unlike the general tendency there was no military involvement in the formation of the kingdom of Poonjar. The kingdom was purchased from various petty rulers and kaimals of Malabar. But there are references to some of the soldiers and police force that were there to maintain law and order in the empire.

Another speciality of the rulers of the kingdom of Poonjar was that unlike many of the Rajas of Malabar, they were kshatriyas. For example the Zamorin of Calicut was a Nair. Caste restrictions were prevalent with full vigour in Poonjar. The King was not happy with the education of the lower castes. There are references in the descriptions of Rev. Henry Baker that the slaves who went to a school in between Mundakayam and Poonjar were given severe punishment so that they might abandon their Christian faith and education

The land was entrusted with many jenmies who in their turn had to pay the land tax to the king. When the collection of tax became severe the jenmies were compelled either to sell or give the land on lease to individual cultivators ${ }^{1}$. In addition to that the royal family was willing to sell its land for the rich

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cultivators. This opened new avenues of migrations and cultivation of land. Many influential and rich families purchased land from the above authorities. This led to the spread of agriculture and settlement of people from Meenachil and other areas to the hilly tracts of Poonjar.

The main source of income for the Poonjar royal family was agriculture. As the kingdom did not have coastal lines, sea-bound commerce and foreign commerce were not there in Poonjar. But as the area had much hinterland, the only way to increase land revenue was the extension of cultivation. Cardamom was one of the principal cultivations of Poonjar high ranges and it was one of the much needed commodities from Poonjar. The Poonjar area, especially the mountainous tracts were apt for the cultivation of spices. There are mentions in some of the writers that the Poonjar area is best for the cultivation of cardamom. Therefore the only way for its economic stability was to increase agricultural activities. This led to the fragmentation of landed property in the area for the cultivators.

The king had legislative, executive and judicial functions but it seems that the kingdom was not fully independent as we see the involvement of the Raja of Thekkumkur in the affairs of Poonjar. Yet another factor which indicates the same is that the kings of Poonjar never minted coins of their own. Instead they made use of the coins of Travancore in some of the transactions. Because of these factors the kingdom of Poonjar could be called as a petty kingdom administered by a petty ruler.

This royal dynasty and kingdom continued till the 20th century perhaps specially on account of its Geographical position. But the kingdom began to shake due to the attack of the Muslim rulers like Hyder Ali and Tippu. Against such a backdrop Poonjar did not have any other option than joining hands with the Raja of Travancore. This alliance gave the final deathblow to the empire.

Now the royal family is there in two thavazhis. One is Kanjiramattam Palace which now belongs to a Trust and the other is the old Poonjar Palace both of which are located in Poonjar. In short we can say that the kingdom of Poonjar was established by the Pandyas who had to flee from Madurai on account of the adverse condition in their homeland. One of the branches of the kingdom left for Pandalam and the other proceeded further to Poonjar. So they are considered to be the descendants of the Pandya dynasty.

Secondly the manner of the acquisition of the kingdom is also worth mentioning that it was by way of purchase and there was no involvement of military action in this process. At the latter stage we find the presence of the forces in the kingdom which was mainly for the maintenance of peace and the security of the kingdom rather than the protection of the same.

Thirdly the kingdom, may be because of its geographical position, did not have trade relations with foreign countries. But the hilly tract of Poonjar was one of the centres of cardamom production. Later on during the period of Manroe we find a shift towards the introduction of plantation industry especially that of tea in the hilly regions. So by this time we find two agricultural processes in Poonjar, viz. the fragmentation of the landed property for the cultivating migrants and the formation of plantation industries.

As the kingdom was in the interiors and was protected by lofty mountain ranges, it did not have threat from the external powers. But the Tamil regions of Poonjar were quite vulnerable. Therefore the Raja of Poonjar paid great attention to the Tamil regions due to the potential attack of the Cholas, Malik Kaffir, Vijayanagara, the Naikas, Navab of Arkott, Hyderali, Tippu, the English and the French who were real threat in those areas. The Pandymandalam was attacked by Tippu and he conquered the areas from Dindugal up to Cumbum. But later on it was re-captured by Poonjar according to the instruction of Raja Kesava Das.

Gradually Poonjar began to loose its territory and autonomy due to various invasions and alliances. When Marthanda Varma became the king, he conquered Chempakassery, Vadakkumkur and Thekkumkur. These rulers had acted against Marthanda Varma in the battle of Kayamkulam. He moved further and defeated Cochin. Later on they entered into a pact as result of which when Zamorin attacked Cochin he

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was helped by Marthanda Varma. During the battle with Vadakkumkur and Thekkumkur, Poonjar helped Marthanda Varama. Pleased at this Thiruvithamkur maintained friendship with Poonjar. As a result even when Thekkumkur and Vadakkumkur were conquered Poonjar remained independent and in friendship with Marthanda Varma.

## CONCLUSION

Thus Poonjar kingdom which came into being as a result of purchase of land remained as an independent kingdom for almost 600 years without much political and military turmoil mainly because of the geographical position of the empire. It had a unique administrative system of its own. The kingdom played a significant role in resisting the attack of Hyder Ali and Tippu. But in its attempt to survival it had to submit itself to the British and Travancore which ultimately led to the reduction of the king of Poonjar to a mere chieftain.

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# Globalization and the World Social Forum: An Anti Globalization Movement for the Protection of Human Rights 

- Sijo K. Manuel


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# Globalisation and the World Social Forum: An Anti - Globalisation Movement for the Protection of Human Rights 

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#### Abstract

Rights are the prerequisite conditions of social life without which it is not possible for humans to lead a better life. The concept of rights that provides a necessary tool for analysing the relation between the individual and the State. 'Globalisation' is a term which has gained momentum now. It is a word much preferred by the intellectuals, media, multilateral lending institutions, business, environmentalists and economists today. This process has emerged as an assertive and powerful force that has forged the world into a single frame. It represents a new interpretation of international relations for redefining the rules of the economy, polity and culture of all the countries, particularly the developing ones. Human rights and there are many reports on relations to globalization which are coming up regularly from every parts of the world. There are several international and national forums working for the improvement of human rights conditions in the world. World Social Forum (WSF) is the leading one among them. World Social Forum Rights (UDHR) withoul affecting globalization. It creates awareness among the pampaigns globally for aimed at preventing and ending the grave abuses of the human the role of the World Social Forum in preventing globalization. This article is rights. It also discusses the different dimensions of relations between protecting and promoting the human rig role of the World Social Forum as an anti - globalisation agent for


 human rights and globalisation and thepreventing negative aspects of globalisation.
Key Words:- World Social Forum, Globalisation, Human Rights, Neo-Liberalism

## Introduction

It has to be emphasised that human existence is very much dependent on the exercise of human rights. They are prerequisite because they help a man meet his basic needs of life, enjoy fundamental rights and lead a life of dignity. They are being provided to all individuals without any bias of their race, language, religion, sex, ethnicity and nationality.

As such, human rights are the minimum rights required for being a member of human family. Every individual, whether he lives in a democracy or in a dictatorship, in a rich country or in a poor country, should have access to human rights. Thus there is universal scope for the human rights. They belong to individuals, and not by countrics. Since the human rights have universal application, they are equally worth and significant in all nations, in all societies, in all communities and in all cultures. Every individual is entitled to have these rights (Baral, Hazari, Padhy 2001: 318). They bring about welfare and improvement in the quality of life of every human being in the society. Human rights received the recognition of the international community on $10^{\text {th }}$ December, 1948 through a resolution of the General Assembly of the UN known as the Universal Declaration of Human Rights (UDHR).

When the matter of discussion is diverted to globalisation, one should take into consideration that it is one of the most controversial concepts of the current times that have evoked a worldwide debate over its theory as well as practice. Globalisation describes a process by which regional economies, societies and cultures have become integrated through a global network of communication, transportation and trade (Bhagawati 2004: 24). Fundamentally, it is the flow of ideas, information, capital, commodities and people. This implies that the world is how becoming highly interconnected through economic, social, political and cultural contacts. In other words, globalisation means 'integrating and
connecting culture connecting cultures and communities in new space-time combinations, and making the 'Globalisation' means integration of econore interconnected (lbid). In short, the term of information, ideas, technologies, Globalisation is a complex process by goods, services, capital, finance and people nutshell. However, it has its own disadvantag the whole world is now shrinking into a the enjoyment of world market and gigantic as well. Though globalisation may witness human rights of the people in the world panational corporations it may threaten the underdeveloped nations. Here comes the imp, particularly in the developing and the the WSF.

## World Social Forum: A Brief Description

The World Social Forum (WSF) is an open meeting place where social movements, networks, NGOs and other civil society ${ }^{2}$ organizations that are in opposition to neoliberalism and a world dominated by capital or by any form of imperialism assemble to pursue their thinking to debate ideas democratically, to formulate proposals, share their experiences freely and network for effective action. Since its inception in 2001, it has taken the form of a permanent world process seeking and building alternatives to neoliberal policies ${ }^{3}$. The World Social Forum is a response of the growing international policies pursued by affluent countries. It is basically an open space for the democratic debate and exchange of ideas about social and economic policies developed throughout
the world.

The main objective of WSF is to exchange of experiences and the creation of propositions for the construction of a human - centred society, which promotes justice, peace and equality for all (http://www.forumsocialmundial.org). Tracing the history of this movement, we come across the fact that it evolved as a direct response to another important event called the World Economic Forum. WSF provided space for the globalising forces to evolve their trade agenda, but the WSF has become a symbol of gathering strength of the forces against globalisation. This forum symbolises of diversity of expression, polyphony of voices that express the universal longing for tolerance, justice, peace and equality. It opposes the market led neo-liberalism, and it upholds that all forms of hegemonic and discriminatory practices be replaced by a fairer, healthier, cleaner version of global trade in which the poorer countries have better opportunities to advances themselves. The vibrant kind of massive support against globalisation is echoed at various World Social Forums. It has to be pointed out that World Social Forum is generally called as 'antiglobalisation meet'.

Anti - Globalization is a pejorative term used to describe the political stance of people and groups who oppose the neo-liberal version of globalization. Anti - globalization may occur in order to arrest on the international transfer of people, goods and ideology, particularly those determined by the organizations such as the International Monitory fund (IMF) ${ }^{4}$ or the World Trade Organisation (WTO) ${ }^{5}$ in imposing the radical deregulation program of free market fundamentalism on local governments and populations. It concerned with the process or actions taken by a State in order to demonstrate its sovereignty and practice democratic decision - making. The anti-globalization movement was developed in opposition to the perceived negative aspects of globalization. This term is in many ways a misnomer, since the group represents a wide range of interests and issues and many of the people involved in the anti-globalization movement do support closer ties between the various peoples and cultures of the world (http://en.wikipedia.org/wiki/globalisation/ world_social_forum). This movement was initiated in the streets of Seattle and Prague at the end of the twentieth century.

In Brazil, a concrete initiative for a worldwide civil society event emerged in the early 2000 with some connection to the first anti-Davos initiatives. The initial formulation of the idea is generally attributed to Oded Grajew, the co-ordinator of the Brazilian Business Association for Citizenship. In February 2000, Bernard Cassen, the Chair of the Association for the Taxation of Financial Transactions for the Aid of Citizens (ATTAC) ${ }^{6}$ and the director of Le Monde Diplomatique, met with Grajew and Francisco Whitaker of the Brazilian Justice and Peace Commission (CBJP) in Paris to discuss the possibility of organising such a forum. Their discussion resulted in the creation of three central ideas for the Forum. The first idea was that it should be held in the South, and more particularly, in the Brazilian city of Porto Alegre. The second point was that the name should be given as World Social Forum (WSF), changing only one key word from the name of a common adversary, the World 'Economic' Forum (WEF). And thirdly, it should be organised during the same dates as the WEF, partially because this symbolism was considered attractive for the media (Teivainen 2001: 122-123). Eight Brazilian Organizations decided to form an Organising

Committee (OC) for the event. In March 2000, they secured the support of the Municipal government of Porto Alegre and the State Government of Rio Grande do Sul, both of which were controlled at the time by the Workers Party. Initially, it was the Mayor of $\mathrm{P}_{\mathrm{r}}^{\mathrm{r}} \mathrm{O}$ Alegre, Raul Pont, who received the idea with great enthusiasm. The State government led by Governor Olivio Dutra decided to spend ample time and effort into the WSF process, Unlike many transnational events in other localities, this forum has strong local roots, During Brazil's military rule, the city was a centre of resistance with energetic neighbourhood associations. The Workers Party was founded in 1980 and it has deep roots in the associations, trade unions, catholic organizations, women's movements and many other parts of vibrant Brazilian civil society. Porto Alegre was a smart choice for hosting the WSF, as both the Municipal and the State governments were willing to allocate significant material and human resources to the event.

## WSF and its Pivotal Themes

The major theme of the WSF is to facilitate decentralized co-ordination and networking among the organizations engaged in concrete action towards building another world, at any level from the local to the international, but it does not intend to be a body representing world civil society. The free Encyclopaedia, Wikipedia, provides the following definition to the World Social Forum as an 'annual meeting held by the members of the and refine organising strategies and inform each other about movements from around the world and their issues'. In the words of Steve Ouma, an African journalist, WSF is an 'assembly of movement of movements' (Xavier 2007: 197). The first meeting of the World Social Forum took place in Porto Alegre, Brazil in 2001, after the major United Nations conferences on the environment, human rights, social development, population, women, habit and the UN meeting that approved the Millennium Development Goals (MDGs) ${ }^{7}$, providing the civil society delegates a major voice in the discussions for the first time. Since its inception, the WSF has grown from strength to strength. Beyond the vision of its founders, the forum has spread its roots and wings across the world.

From Porto Alegre to Nairobi, it is a clear indication of the future rod Meanwhile, the civil society has witnessed multiple effect the future road map of WSF. great role in the organising of many regional social forumects of the WSF. It has played a Forum, the Asian Social Forum, the Meditteranean $S$ national social forums such as the Italian Social Forum Social Forum and many local and Social Forum and the Boston Social Forum etc. majum, India Social Forum, Liverpool the WSF Charter of Principles drawn up by the World Arturo Escobar, Peter Watermen 2004: 257). WSF is Social Forum (Jai Sen, Anita Anand, organizations, which offers a self-conscious effort to an annual meeting of the civil society the championing of counter-hegemonic globalization. Thelop an alternative future through the World Social Forum to be a physical manifestatione are some people who consider brings together the non - governmental organizations, ad of the global civil society, as it and informal social movements seeking international solidacy campaigns as well as formal

Even though there are many defintrons the World Social Forum grefers to detioe itself as "an opened space - plural, diverve, non-Eovemmental and non-parti:an - that stimulates the decentralized debate. reflectrent, propouls buildinge cuportences otctane and alliances among movements and orgamzatrons engagod mo concretc actront bo moth more solidarity, democratic and fant wotld a pemmancot spase and procer the altof. alternatives to neoliberalism." It is constmuted by members of the abery a globalization movement (also teferted to as the global justroce morctroneses, and ufforth platform to coordinate global campaigns, share and refine organmong stratefen world Socal each other about movements around the world and their particular tssucs the who attend and Forum takes special care in not becoming a representative of all of thes. Tho World Socal thus does not publish any formal statements on behalf of the participarms. Thenst nco-liberal Forum emerged as a response to the growing international movemont aga slogan 'Anothet economic policies and the capitalist- led globalisation built around

## World Is Possible". It cannot be viewed as a distinct source of power <br> \section*{WSF and its Role in the Protection of Human Rights}

It is a matter of fact that the social movements have a long histofy of cooperation across national borders. The point to be noticed is that the intensification of global, economic, political and cultural interaction has, during the last two decades, radically intensified those relations of transnational social movement co-operation The world witnessed convergence of different global movements in mass demonstrations from Seattle to Genoa and Gothenburg, criticizing the present system of global governance (hutp:/h www.ephemeraweb.org/journal 5-2/5-2 yla-antila.pdf). The Latin American, French and German demonstrations against the IMF and World Bank and for the cancellation of the debts of the third world in the 1970 s and 1980 s, remained rather isolated national events because there was less means to co-ordinate collective action ghapened because there was neither globalization to resist nor a cuttural trame to unte the mobilizations to a movement. These is no consensus over whe globalization, the Global e called anti-globalisation, alternative globalization, critics of not yet westablishat Justice Movement or whatever demonstrates that the to bring together the global civil That process has given rise to the Whe debates over the global political issues.
society actors to take part in public dessible by the extension of repertoires of collective
The movement was made possib global level and by the creation of the cultural action and associational networks to The WSF is regarded as a resource for the diverse frame of alternative globalization. The . The main strength of the form is its diversity. organisations struggling for another wond. peasant movements, human rights movements, trade unions, feminists, ecologists, soctalise the corporate led globalisation and its 'products' all united in the common platform to refuserialist wars, environmental depletion, financial like social inequality, foreign debt, imper dealing with the issues regarding human rights. speculation etc.. WSF plays a major role ind rights issues are described in detail in the The ways in whic
coming sections.

## WSF: An Alternative Globalisation

 are held together by shared identities, all of the participants to the common debate seem ty globalization. The (TNCs) ${ }^{8}$ in the world economiche combination of the deregulation of financial markets and decades. This is mainly due to the technological innovations. The international importantly the WTO, the IMF and the World Bank, have also strengthened their influence in global governance at the expense of some of the more democratic global decision making structures (Teivainon 2004: 178).The WSF always tries to create a structure, constituting various organizations and movements, for a capitalist-free world. It is a typical kind of globalising the resistance the scope of the democratic pubtion of the economy as a political sphere of society, outside widened to include economic issues as well. Themands the scope of public debate to be and cultural exclusions from global public sphere aims at countering formal, structural narrowing down the scope of public debate spheres and the economistic mechanisms of has been emphasized by some of the key orgnother globalisation' is an expression that WSF comes up with many opportunities for panisers of the Porto Alegre Meetings. The for the attainment of another world.

## The Relation between WSF and Neo-Liberalism

The World Social Forum emerged as a result of the mobilizations against neoliberal globalisation. There was an increasing need for the formation of an international space for reflection and organization of those who oppose the neo-liberal policies or are building alternatives to prioritize human development and the overcoming of are supremacy in each country and in the international and the overcoming of market for the emergence of the WSF. The debate on the forum is part This was one of the reasons on how to generate from the common perspective of is part of a more general reflection spaces of inclusion that are useful both to critic, alternatives and strategy against the neo-libera reflection and better definition of article. $1166 . \mathrm{html}$ ). There is not much in common beral model (http://www.alternative.ca/ Neo-liberalism is the world's dominant political and between the WSF and neo-liberalism. of competitive individuals governed by the invisible hand ideology, promoting a system of competitive individuals governed by the invisible hand of the almighty market. The

WSF is a 'people's alternative' to the elite World Economic Forum, bringing together thousands of people to fight against neo-liberalism and build another world.

The process of economic globalization promotes the neo-liberal policies under the auspices of the advanced Western world. The WSF rejects the idea of neo-liberalism and those globalization policies that literally make millions of people across the globe as mere tools of production while massive profits are reaped off from their labour and enjoyed by a few international capitalists. Since 2001, the World Social Forum process is raising questions regarding the rules of global investments and governance dictated by the World Economic Forum. It proposes democratic, people-centred alternatives to imperialist globalization. People's movements across the world are working to demonstrate that the path to sustainable development and social and economic justice does not be in neo-liberal globalization but in the alternative models for people - centred and self-reliant progress (http://www.wsflibrary. org/index.php/). In effect, World Social Forum is the growing opposition to the neo-liberal policies and globalization of the world economy that were the overwhelmingly dominant tendency in capitalism during the 1990s.

The trend which is increasingly seen today is the policies of privatizations, lowering the tariffs, greater integration of the world economy have massively widened the gap between the rich and poor (http://www.socialistparty.org.UK/wsf.htm). The tightened grip on the neo-colonial world by the main Western imperialist power has deepened the huge gulf between the so - called colonial world and the imperialist countries. The impact of this is in a much sharper division between rich and poor within all countries. The World Social Forum attempts to negate all forms and shapes of policies based on neo-liberalism. Neoliberal policies create misery and insecurity. The date September 11 marked a dramatic change in the globalised era. After the terrorist attacks, the WSF condemned all forms of attacks on civilians in other parts of the world (Sen, Anand, Escobar \& Waterman 2004: 102).

The fact is that the government of United States and its allies are now increasingly launching massive military operation. The United States and its coalition forces attack the civil and political rights of nations all over the world under the name of 'war on terrorism'. It was in the name of democratization and the elimination of Weapons of Mass Destruction, the United States and its allies attacked Iraq. They accepted diversified forms of means to expand their power in the global politics. That kind of war reveals another face of neoliberalism, a face which is brutal and unacceptable. The vehement opposition of that kind of war and strategies of affluent states is at the heart of the World Social Forum.

## WSF and its Popular Actions

Nowadays there are many global protests taking place against corporate dominated globalization all over the world. Along with these protests, the US sponsored neo-liberalism and war has resulted in a new wave of radical democratic protest and counter propositions. The role of the World Social Forum has played an important role in building the world wide opinion against the neo-liberal globalization is not a minor one. The WSF and its many offspring are significant not only as sites of affirmation and debate but also as direct
democracy in action. A combination of the periodic face-to-face meetings and intense e. mail and Internet contacts has made the WSF network to pull off events and to arrive at consensus decisions. The power of the WSF lies in its strong mobilization against a unified force of neo-liberalism that has been unleashed on the poor countrics. They often conduct unique meetings in their own right which have similar agendas but motivated by different set of values.

It has been already mentioned that the WSF is an open space for the democratic debate and exchange of ideas about social and economic policies that have been developed all over the world. It is a significant movement in the collage of opposition to the dominate ideology. It functions as a means to generate a collective conscience and to elaborate alternative theories. Its essence and vitality are associated with the trenches of containment against the avalanche of globalization, trenches dug by groups of men and women who are building the conditions of their own economic, social and cultural life (http://www.democracyinaction.org/organization/ vfpjlevent/accessed). There is no way to grasp the forum without linking it to the growing wave of public protests against globalization, as occurred in Seattle, Washington, Prague etc. The people behind the forum are the same actors in the same struggles, movements, associations and organizations, however, small or large, local or national, regional or global.

On the whole, it is the global convergence of the various networks and movements that creates and sustains the World Social Forum. It aims to create democratic space for global citizens to reflect and exchange knowledge and experience. In addition it also attempts to extract the constructive common essence of diversity, which exists in global appreciable achievement of the to the dominate ideology. This can be pointed out as an neglected that the social network of organiz forward certain historical facts, it cannot be extensive experience of participating in local government, wements in Brazil, with their the realization of the forum and a clear signal to the went, were necessary conditions for political sense of the organizers that they could the world. In fact, it was due to the good of the World Social Forum as the synthesis of all the wishentify the immediate objectives acted as a counterpoint to all that the Davos Forum wishes of the participants and thus it as a movement, strengthened through common actions and As a matter of fact the WSF,

The constituent members of the Forum actions and mobilization for social justice. know and criticize the decisions of their own govasize that the people have the right to dealings with the international institutions. Emplernments, especially with respect to democratization of States and societies and the struggle agise also given to the need for the Escobar \& Waterman 2004: 102). The WSF is also figle against the dictatorship (Sen, Anand, against foreign military bases and interventions and the gygainst the war and militarism, These are some among the strategies developed and incorporatic escalation of violence. the national Social Forum has been founded by the dircorporated by the WSF. In Austria, America a long time globe-trotter involved in the inector of a research centre on Latin Likewise, the Catholic Committee against Hunger and for
become one of the leading actions of the French alter - globalization convergence. The centre has committed itself massively in the international alter globalization movement since its carly begimning and its leader, F. Houtart, has been an important actor of the movement internationalization process and an active member of the International Council of WSF.

In Belgium, the development of national and local social forums by trade - unionists, the NGO activists, citizen's networks, local movements and cultural actors in 2002 in turn generated an unprecedented involvement at the national and local levels among scholar activists. The main Belgium Development NGO network also is not different. It has played a major role in the launch of the Belgium Social Forum in 2002 and 2003 and hired some of the most productive young intellectuals of the alter-globalization national scene. Its development campaigns in the South remain the main goal of the organization. Along with these campaigns, several new projects and campaigns have been set up in Belgium. All types of forums are not about being against globalization. Some forums focus on a different kind of globalization. The annual and multiplication of meetings and events at an international level has strengthened the constitutional process of alter-globalisation cosmopolitan elite. As a result, the gap between the globe-trotting leaders and their fellow grass root activists has been widened.

One of the major impacts of the World Social Forum process was the creation of new opportunities of encounter and interactions between the activists in significant ways (http://www.focusweb.org/html.accessed). It has not only encouraged the local activists to an international level, but also generated a renewed interest for local and national activism and civil society amongst the cosmopolitan activists. It has to be stressed that this Forum has never remained under the complete control of few organizers. Its initiators have provided an open space that has given chances to the local activists to be heard by a large audience. The encounter and the debate between distinct visions of the WSF have caused significant changes in the event's organization, particularly in its 2005 edition. The WSF provides a platform for the local activists from many parts of the world to meet, to share their experience, and to network. Since 2003, the network has gathered French illegal migrants, supporters, Indian dalits, Brazilian landless farmers and homeless movements and Argentinean jobless piqueteros alike. They are indebted to the WSF as it has encouraged them to frame their local struggles in a wider perspective and to connect them to a larger movement.

WSF is an umbrella term for many activists; the WSF represents a unique experience for global consciousness. It has allowed many local activists to access the global level in their claims, experience and networks. Such international meetings are indeed an alternative to the myopic tendencies that have emerged from the local struggles. The remarkable feature of this Forum is the provision of an international platform to local movements that help to make their claims and messages heard in the international as well as in their own national space. The seventh edition of WSF, (2007) was held in Nairobi. It allowed the Kenyan and African homosexual rights activists to make their cause visible in their local and national public sphere at an unprecedented level. At the same time, alter-globalisation
propelled local and national activists in the global civil society. It also created a renewed interest amongst the cosmopolitan activists in their respective home countries in the national and local movements, which had been previously neglected by them. This has especially been the case among the 'Third-World solidarity' sector whose actors and networks found renewed interest in the political and social contexts of their homelands with the national and local social movement process (http://www.ephemeraweb.org/journal/5-2/5-2 ylaanttila.pdf). Some of them have become key action in both local and national alter globalisation convergences.

## Conclusion

Globalization is a vital process faced by the international community. It is actually a euphemistic for bringing the entire world under the control of the dominant powers. This process is an unavoidable reality in the changing scenario. The WSF emerged as an alternative against the exploited forum of globalization. The forums of aggregation and articulation which were made possible by the World Social Forum were sufficient enough to achieve the goals of the phase that may now come to an end. Various forms of aggregation and articulation of higher intensity are essential to deepen the goals such a process includes articulating struggles and resistances, as well as promoting ever more comprehensive and consistent alternatives. These articulations presuppose combinations among the different social movements and the NGOs that kind of question their very identity and autonomy as they have been conceived of so far. If the process is to promote counter-hegemonic practices, and to do so in a horizontal way and with respect for the identity of every movement, an enormous effort of manual recognition, dialogue and debate will be required to carry out

However, the WSF has proved to be successful in all its endeavours till date. In spite of success of the WFS - its organizational and programmatic novelty, global reach, and style of consensus building - the question of its future has become recurrent. The question of efficaciousness is one of the most divisive questions. It creates disunity in the sense that efficaciousness can be measured in terms of different criteria and there is no conse that about which to adopt. The evaluation of the efficacioria and there is no consensus exercises that best disclose the confrontation betweenousness of the WSF is one of the social information. The emergence of a global consciou new and the old conceptions of NGOs, regardless of the scope of their action hersciousness among movements and the of scale between hegemonic globalization and theen decisive to create certain symmetry it. The dozens of forums held since 2001 bear witness onents and NGOs that fight against is and of how much is to be done in order to pitness of how precious this consciousness
erve and strengthen it.
It is inadequate to assess the efficaciousness of the WSF exclusively in terms of global changes in the light of the trans-scale nature of the struggles encompassed by the

WSF. It has to be assessed in terms of local and national changes as well. The interaction and exchanges between the movements, within the WSF, have contributed to prevent movement towards either closed localism or disconnected expert cosmopolitanism but also helped to maintain openness within the Forum. They have also resulted in productive and creative interactions, leading to more participatory meetings and a better balance between local and global claims, strategies and events. The diffusion of the participatory and network values and practices within the WSF among the cosmopolitan elite activists shows the core of the alter-globalization movement. The novelty of the WSF is consensually provided to its lack of leaders and hierarchical organization, its emphasis on cyberspace networks, its ideal of participatory democracy, and its flexibility and readiness to engage in experimentation. The reality is much more complex and the questions of representation and participation are likely to remain wide open in the foreseeable future.

Another point also demands serious attention. Even if the limits of the world dimension of the WSF are pushed back as much as possible, the issue of representation will always be in the forefront until the selection criteria are more transparent and democratic and the conditions for participation more equally distributed. If this is made practical, it will definitely help to adopt a broad conception of the WSF, turning the WSF into a permanent process and promoting the continuity among its many initiatives defined distinct conceptions of the movements' process and of the strategies that lead to social transformation. The alter-globalisation movements should not be considered as a homogenous actor but as a cross-fertilization process of various activists' trends. The WSF should be viewed upon as a double-sided process. It has not only strengthened the importance of the internationalisation of the movement but also promoted a renewed interest for the local by the cosmopolitan activists.

This has resulted in widening the gap with the globe- trotting cosmopolitan intellectual activists. It has also opened spaces for activists to contest the vertical way they run the form and the movement. The forum has led to the creation of a collection of topics that affect every one of possible alternatives and strategies to make them feasible. The Forum did not seem to be systematic, but it was a very clear collective effort in nature. It is clear that its opening to an umbrella of more broad and diverse social forces will be, at the same time, a source of contradictions and tensions. The WSF lacks cleat cut ideological positions. But it differs in alternatives to globalization process. Some alternatives should be developed according to the socio-political and economic circumstances of the every society. Apart from the contradictory features of WSF, the idea of World Social Forum has its own relevance and significance in the globalised era. It has its own status and relevance in the field of contesting globalisation, in a peculiar manner, in the changing scenario of global politics.

To wrap up the entire thing, this article throws light on how the concept of globalisation acts as a barrier to the human rights. This study is interdisciplinary in its approach relying on international human rights law, morality, sociology, psychology, ethics and international politics. As human beings, it is our right to exercise fundamental rights to lead a life of dignity. Human rights belong to all the individuals in a society irrespective of the factors that make up the difference among them like religion, language, sex, ethnicity, nationality and so on. Nowadays globalisation has become an expression of frequent usage. Unfortunately, it connotes different things to different people. To some, it represents a brave new world with no barriers. For some others, it spells doom and deconstruction. Another connotation of globalisation is correct with respect to the human rights. The essence of globalisation is connectivity. It refers to the intensification of global interconnectedness, suggesting a world full of movement and mixture, contact and linkages and persistent cultural interaction and exchange. On the whole, globalisation aims at converting the whole world into one global village in which all people are increasingly interconnected and all the fences which divide them are removed. Though the idea of globalisation is beneficial to the global market, it is harmful in the sense that it threatens the human rights of the people in the world, particularly in the developing and the underdeveloped nations. This article has focused on how the World Social Forum plays an influential role in taking action against the Human Rights issues and how their effectiveness could be measured. The World Social Forum as an anti-globalisation movement and the steps taken for preventing the negative aspects of globalisation are also discussed in detail. This paper highlights the importance of the WSF in safeguarding and protecting the human rights.

## Foot Notes

1. The Universal Declaration of Human Rights (UDHR) was adopted by the United Nations General Assembly at its $3^{\text {rd }}$ session on 10 December 1948 as Resolution 217 at the Palais de Chaillot in Paris, France. Of the then 58 members of the United Nations, 48 voted in favour, none against, eight abstained, and two didn't vote. The Declaration consists of thirty articles stating to affirm an individual's rights which, although not legally binding in themselves, have been elaborated in subsequent international treaties, economic transfers, regional human rights instruments, national constitutions, and other laws.
2. Civil society refers to the aggregate of non-governmental organizations and the institutions that manifest the interests and the will of the citizens. It also refers to the individuals and the organizations in a society which are independent of the government. According to the Collins English Dictionary the term is used in the more general sense of 'the elements such as freedom of speech, an independent judiciary, etc, that makes up a democratic society'. It is commonly known as the 'third sector' of the society. A defining characteristic of the organizations that constitute the civil society is voluntering which in turn are often called the NGOs, or the NPOs. Most authorities think that public participation is an unavoidable characteristic of the voluntary associations but it is not necessary to belong to all of
these to be a part of civil society.
3. Neoliberalism is a term very frequently used in social studies and economics. It refers to the transfer of economic factors to the private sector from the public sector. This model is based on the principles of neoclassical economics. Some of the major assumptions of neoliberalism are governments must
limit subsidies, make reforms to tax law in order to expand the tax base, reduce deficit spending, limit protectionism, and open markets up to trade. It also seeks to abolish fixed exchange rates, back deregulation, permit private property, and privatize businesses run by the state.
4. The International Monetary Fund (IMF) is an international organization with 189 member countries. The objectives of this organisation are fostering global monetary cooperation, secure financial stability, facilitate international trade, promote high employment and sustainable economic growth, and reduce poverty around the world. It headquarters is located Washington, D.C. This organisation took its birth in 1944 at the Bretton Woods Conference primarily by the ideas of Harry Dexter White and John Maynard Keynes. It came into formal existence in 1945 with 29 member countries and the goal of reconstructing the international payment system. It now plays a central role in the management of balance of payments difficulties and international financial crises.
5. The World Trade Organization (WTO) is international organization which has gained global attention as the only organisation dealing with the rules of trade between nations. The WTO agreements negotiated and signed by the bulk of the world's trading nations and ratified in their parliaments. The goal is to help producers of goods and services, exporters, and importers conduct their business.
6. Association for the Taxation of financial Transactions and Citizen's Action (ATTAC) is an activist organization. It is originally created for promoting the establishment of a tax on foreign exchange transactions.
7. The United Nations Millennium Development Goals refers to a set of eight goals that all the 191 UN member states have agreed to try to achieve by the year 2015. The United Nations Millennium Declaration was signed in September 2000. It encourages the world leaders to combat poverty, hunger, disease, illiteracy, environmental degradation, and discrimination against women. The MDGs have sprouted from this Declaration, and all have specific targets and indicators. The Eight Millennium Development Goals are:- to eradicate extreme poverty and hunger; to achild mortality; to improve education; to promote gender equality and empower wond other diseases; to ensure environmental maternal health; to combat HIV/AIDS, malaria, and country perhaps by building a factory or a shop, this is
8. TNCs - When a foreign company invests in a country, (MNCs) or transnational corporations (TNCs) called inward investment. Multination are well set up and established in several countries. basically refer to those companies which are well set up and estabe

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# Aponogeton Undulatus Roxb. (Aponogetonaceae), a new addition to the flora of Kerala, India 

- Biju P., Josekutty E. J and Jomy Augustine


# APONOGETON UNDULATUS ROXB. (APONOGETONACEAE), A NEW ADDITION TO THE FLORA OF KERALA, INDIA 

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#### Abstract

Aponogeton undulatus collected from a stream in Paliyeri, kerala, India is reported as a new addition to the Flora of Kerala. A brief description and photographs of the species are given.


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## INTRODUCTION

Aquatic genus Aponogeton L. F. is represented by approximately 57 species all over the world (Chen 2015). Yadav and Gaikwad (2003), in their revision work reported 7 species of Aponogeton from India. Later on a new species, Aponogeton nateshii was reported from, Maharashtra, India (Yadav 2015). Sasidharan (2013) and Ansari et al. (2016) reported 3 species of Aponogeton from Kerala, India.
During the floristic exploration in the wetlands of Kannur District of Kerala, the authors collected specimens of Aponogeton with bulbils from a stream. The detailed study of the specimen showed that, it is Aponogeton undulatus. This viviparous species (Van Bruggen 1970) is not reported from any districts in Kerala, India and it is a new addition to flora of Kerala.

## Taxonomy

Aponogeton undulatus Roxb. (Fig. 1) in Hort. Beng. 26, 1814, nom. inval. nom.nud.; bruggen, Blumea 18 (2): 465. 1970; C. D. K. Cook, Aquat. Wetl. Pl. India 49. 1996; Yadav \& Gaikwad, Bull. Bot. Surv. India 45: 66. 2003; Bhat, Fl. South Canara 81. 2014.
Aquatic, submerged, perennial, tuberiferous herbs, $1-2 \mathrm{~m}$ high. Tuber obovoid-cylindrical, brownish, 2-3 $\times 1.2-2 \mathrm{~cm}$, covered by adventitious roots. Roots many, arise from the top of the tuber, yellowish brown, 2-15 cm long, secondary

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branches capillary. Leaves submerged, simple, petiolate; petioles $30-170 \mathrm{~cm}$ long, length varies with depth of the water, obtusely triangular, greenish; lamina oblong-elliptic, brownish green, obtuse or shallowly emarginate at the apex, $18-30 \times 3-8 \mathrm{~cm}$, round at the base, midrib prominent at the base with 4-6 parallel nerves, closely arranged thin nerves


Fig 1 Aponogeton undulatus Roxb. A. Habit; B. Habitat; C. Bulbils. ".

# Role of Women Workers in the Plantation Sector of Kerala 

- Sony Alias, James John


# ROLE OF WOMEN WORKER'S IN THE PLANTATION SECTOR OF KERALA 

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#### Abstract

Agriculture and allied activities, mines, fisheries, construction activities and plantation are the chief areas where women are absorbed as workers. Major four plantation sectors in Kerala like Tea, Coffee, Rubber and Cardamom provide significant employment opportunities to women. About these four sector tea industry consist largest organized employers of women. It gives round the year employment to more than one lakh workers. Compared to other agricultural employment unique role played by women in the plantation sector. Their socio-economic life and status are entirely different as they are residing in the remote hilly regions. Their condition of living inside and outside their workplace is determined by the employers. Women work in the plantation sector provides complementary support to the family's income flow. In the plantation sector the role of women workers is miscellaneous and peculiar. The working condition of women in plantation sector is very pathetic, but after the Plantation Labour Act passed by the government of India lot of changes in this field. After all there is number of factors responsible for women workers concentrate in plantation sector.


## INTRODUCTION

Generally plantation field have four categories of workers, male female, adolescents and children. Another important district feature of plantation industry is employment of children and the high rate of female employment, but it is usually in tea plantation. The recruitment of plantation workers is made either on permanent of or casual basis. The initial recruitment is often made as casual workers and as when permanent vacancies arise the casual workers are appointed to these vacancies. The plantation sector consist crops like tea, coffee, rubber and cardamom, it occupies an important position in Kerala economy. Plantation sector provide lot of employment opportunities for women. In the family women
play a key role, but in some families women are the bread winner, toiling whole day inside and outside the household. Nature of employment in plantations is agricultural, organized in the rural setting. In plantation sector most of these women workers bring their parent, brothers and sisters with them who get seasonal employment. In those plantations where women are preferred to men, the dependency burden is very high as far as those women labourers are concerned works in plantation industries are illiterate, superstitious and believe in customs and traditions. They also developed plantation culture on the bases of kingship relations, festivals, occasional trip to their native places and involvement in trade union activities.

## Objectives

- To trace the working condition of women workers in plantation sector.
- To identify factors that responsible for women workers concentrate in plantation sector in Kerala.
- To understand main problem faced by women workers in plantation industry.
- To analysis the remedial measures to overcome the problem faced by women workers in plantation sector.


## Working condition of women in plantation

The working conditions of workers employed in plantations are governed by the Plantation Labour Act, 1951 and the rules promulgated by the state government. The Plantation Labour Act inter- alia requires the employer to provide to the workers and their family members medical, housing, sickness and education facility and various other social security benefits. The act applies in the first instance to tea, coffee, rubber, cinchona and cardamom plantation. In tea plantations the proportion of skilled male and female workers is 13.3 per cent and 10.4 per cent respectively. In cardamom plantation 97 per cent workers include male and female are unskilled whereas the rest3 per cent are skilled. Cent per cent male and female workers in Kerala are unskilled. The workers of plantation industry in tea, coffee, rubber and cardamom are found directly employed by the employer, no contract worker is found. In plantation industry, majority of the workers employed are unskilled and many of them are not aware about the provision of Minimum Wages Act, 1948, Equal Remuneration Act, 1976 and the various other labour acts enacted for their life. The high rate of illiteracy and low level of awareness make them more vulnerable to exploitation by the employer.

## Factors Responsible for Women Workers Concentrate in Plantation Sector

1. Plantation provides regular and steady employment to the workers.
2. Works in plantation are agricultural in nature and requires light manual work.
3. Some of the plantations provide accommodation to the labour eg; tea, coffee.
4. The low income of the family forced the women to work in order to add their own share to the family purse.
5. Plantation also provides employment opportunities as casual workers for their relatives during peak session.
6. Low wage of their husbands compelled women to seek employment.
7. Other important factor was high rate of literacy among women and also desire for financial independence.
8. Many plantations prefer women to men in providing employment.
9. Plantation offer a regular and steady income to women workers their contribution to family income is ensured.

## Major Problems Faced by Women Workers in Plantation Industry

The living and working conditions of the plantation workers especially women with low wages is very poor. Many of them live in one room line houses with no sanitation and basic facilities like drinking water. Numbers of families is left malnourished and are vulnerable to the communicable diseases. There are no medical facilities provide to the plantation workers. There are issues related to exposure to the chemicals used in plantation estate which may affect their health. There is little scope for the quality

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education to their children and in many cases children are employed for work. There is an absence of trade unions to represent their problem to management. Even if there are any trade unions, they are male-dominated and ignored the issues of women workers. The absence of trade unions and the state on the one hand, and the exploitative management on the other hand resulted in miserable life for workers. They denied the minimum wages for the workers.

The main problems faced by women in plantation industry such as, there is no proper welfare measures and proper lines of approach, women is physically weaker than man, the gender based inequalities, several types of exploitation in work place. The tea plantation workers in India are covered by the Plantation Labour Act (PLA), 1951, which regulated the working and living condition of workers. It also prescribed standards for housing, healthcare and education, regulates working conditions including maximum working hours, overtime payment, child labour, paid leave and sickness and maternity benefits. But there is an absence of state to implement the act.

## Remedies

The plantation sector remained one of the largest employers of workers in India. fir workers, the government should take steps to improve their living conditions with construction of houses and provision of basic amenities. Development of better health care facilities and education facilities for the children should be the priority. Effort should be made to develop strong trade unions to bargain with the management about the workers issue. The existing gender discrimination should be eliminated with equal representation for women in trade unions. Focus should be on improving the competitiveness and productivity of the entire industry. Government on its part can provide concession in the form of lower plantation tax and subsidized electric supply.

Table1 - Details of Women Employment System in Plantation

| Sl.No | Type of Plantation | Women Employers | Male Employers | Total |
| :---: | :--- | :---: | :---: | :---: |
| 1 | Rubber | $1084(22 \%)$ | $3846(78 \%)$ | $4930(100 \%)$ |
| 2 | Tea | $2971(45 \%)$ | $3679(55 \%)$ | $6650(100 \%)$ |
| 3 | Cardamom | $1928(40 \%)$ | $2942(60 \%)$ | $4870(100 \%)$ |
| 4 | Total | $5983(36 \%)$ | $10467(64 \%)$ | 16450 |

From this table 1, it is seen than compared to other plantation, women employees are more found in tea plantation ( $45 \%$ ) followed by cardamom ( $40 \%$ ) and rubber $(22 \%)$. It is seen that compared to tea and cardamom, there are little number of women employees are only $36 \%$.
Factors to Analysis women Physical Quality Life in Plantations

- Consumption pattern
- Health standard
- Education status
- Working condition
- Living condition
- Social and cultural activities
- Financial position

Table 2 - Details of Strike / Other Dispute in the Plantation Sector

| Sl.No | Type of Plantation | Strike/Other Disputes | No Disputes | Total |
| :---: | :--- | :---: | :---: | :---: |
| 1 | Rubber | 10 | 90 | 100 |
| 2 | Tea | 15 | 85 | 100 |
| 3 | Cardamom | 8 | 92 | 100 |
| 4 | Total | 33 | 267 | 300 |

Compare to other type of industries, strike/other labour problems are very few in plantation fields. The main reason for this dispute was mainly related to wages. Beside there are other reasons such as lack of basic facilities like accommodation, medical facilities etc. From these table we can see

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that, compared to other plantation, strike/ other disputes are more in tea estates ( $15 \%$ ) followed by rubber ( $10 \%$ ) and cardamom ( $8 \%$ ).

## CONCLUSION

In this article highlighted that working condition and problems faced by the women workers in plantation sector of Kerala and also recommended to improve the physical quality of life and quality of working life of these women workers. For the improvement of workers in plantation industry of Kerala needed a multi dimensional approach. In recent time's number of strike in different parts of Kerala conducted women workers in plantation sector. The plantation Labour Act gives certain social and economic rights to unskilled manual workers in these plantations, who are descendants of millions of indentured workers transported to these plantation areas from far off place. The contribution of women workers for the development of Indian economy was very crucial.

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Historical Approach to the Origin and Growth of Rubber in the World with Special Reference to the Cultural and Archealogical factors.

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# itorical Approach to the Origin and Growth of Rubber in the World with Special Reference to Cultural and Archaeological Factors 

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#### Abstract

indispensability of rubber is undisputed in the contemporary world. The origin of the rubber plant be traced to be Brazilian Jungle. It was in 1770 that the first use of rubber was discovered, that can e led pencil marks. Hanissant and Manager, two French nationals paid more attention to the industrial of rubber. In Britain, Thomas Hancock is considered as the father of rubber based industry. Since D's development of rubber plantation industry has been very fast and in almost all the producing ltries. This articles gives more importance to the archaeological aspects of rubber in ancient American iisation. It also considers the aspects of civilisation through rubber in Kerala.


## INTRODUCTION

Rubber is a tropical tree and its scientific name is 'Hevea brasiliensis'. It is a native of Amazon c in Brazil and adjoining countries, Ecuador and Colombia. The British scientist Joseph Priestlay is -edited with naming the Rubber of its attribute to erase pencil marks. It is a by-product of the cell abolism of many species of plants. It plays a vital role in the old and modern civilization. It was the overy of "vulcanization" in 1839 by the Good year that led to the greatly increased demand and the snsive exploitation of the wild Hevea trees in lower and upper Amazon. Hevea was taken from azon to south Asia (Sri Lanka) by the British Colonial office, where it was grown experimentally and $r$ on as plantations,

## ly method of Processing Rubber

Much of the Rubber going to Europe came from the Amazon basin of Brazil. It was harvested by :ing cuts in the bark of the main trunk with a small axe and collecting the latex which flowed from the

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cut vessels. The latex was poured over a ball of coagulated Rubber from previous harvesting and them dried by smoking in what was already a well-appreciated technique for hardening and preserving Rubber. When the ball grew large enough from successive harvesting and smokings, it was sent to market.

## Rubber Industry

First and foremost, the father of the Rubber industry was Thomas Hancock. He dissolved Rubber in turpentine and used the solution for coating cloth and other materials. But he found, as others had, that the solution left a sticky film of Rubber as it dried. Hancock had a baker's oven built to warm his masticated Rubber and pressed it into block of considerable size.

## Objectives of the study

- To analyse and understand the origin and growth of rubber.
- Understand the early methods of processing rubber.
- To analyse the archaeological evidences of rubber.
- Find out the place of rubber in ancient and modern life through beliefs and myths and how it changes the human life style.
- Analyse the civilisation through rubber in Kerala


## History Culture and Archaeology

Archaeology offers a unique perspective on human history and culture that has contributed greatly to our understanding of both the ancient and the recent past. Archaeology helps us understand not only were and when people lived on the earth, but also why and how they have lived. Archaeology allows us to travel far back into the time before written languages existed and to glimpse the lives of everyday people through analysis of things they made and left behind. Archaeology is the only field of study that covers all times period and all geographic regions inhabited by humans.

Prehistoric archaeology focuses on past cultures that did not have written language and therefore relies primarily on excavation or data recovery to removal culture evidence. Historical archaeology is the study of cultures that existed during the period of recovered history several thousands of year in parts of the old world.

## Ancient Rubber and its Archaeological evidence

Ancient Rubber was made from latex of the Rubber tree (Castilla dastica) which is indigenous to the tropical areas of Southern Mexico and Central America. Archaeological evidence indicates that Rubber was already in use in Mesoamerica by the Early Formative Period. A dozen balls were found and dated to roughly 1600 BCE. 3000 years later, Rubber was being exported from the tropical zones to sites all over Mesoamerica. Both Aztecs and the Maya culture, the Rubber latex that flowed from the tree represented blood and semen. Rubber was there fore symbolic of fertility and was often burned, buried (fortunately for archaeology) laid in a sacrificial pool as an offering to various deities. Various sizes of solid Rubber balls are used in Mesoamerican ball game. The exact sizes or weights of the balls actually used in the ball game are not known. The sizes varied according to the ball game version played ie hipball, hand-ball, stick ball etc. Archaeologist Laura Filloy Nadal compiled the following details of the balls.

| Ball Struck with | Ball Diameter | Ball Weight |
| :--- | :---: | :---: |
| Hip | 20 cm | $3-4 \mathrm{~kg}$ |
| Heavy bat | Unavailable | $500-600 \mathrm{~g}$ |
| Forearm | 11 cm | 500 g |
| Heavy glove | $8-10 \mathrm{~cm}$ | $170-280 \mathrm{~g}$ |

It is therefore assumed by most researchers that the ancient hip-ball was roughly the size of a volley ball and weighed between $3-4 \mathrm{~kg}$. So it is 15 times heavier than the air filled volley ball of now-adays. The images of skulls superimposed on balls found on several Maya artifacts have led several

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researchers to suggest that skulls of the sacrificial victims are wrapped with Rubber to create hollow balls. Other than these images, however, there is no evidence to support such an assertion.

Though the exact rules of the game are not known, it is generally believed that the game was played more or less like today's volleyball. Players wore helmets, pads and thick protective yokes around their mid-section and kept the ball in play by hitting it off their heps. The Mesoamerican ball game makes its first appearance among the Olmec around 1500 BC, in the Central Gulf Coast of Mexico, an area known at the time for latex production. Many balls have been discovered in the region as part of burials and as ritual offerings at shrines, suggesting the balls and other ball game account rements were sign of status or wealth.


Ball game in ancient Mayan Civilization

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Hosier, Tarkanian and former collegue Sandra Burkett had already discovered in 1999 how ancient civilizations such as the Maya and Olmec created Rubber by blending sap from local latex trees. They claim the Mesoamericans producing different Rubber for different products. According to them a three-to-one compound creates the most durable rubber, ideal for making sandals. Though no original sandals have ever been discovered in that time. There is also clear linguistic evidence. The Mexica used a compound word that combines the words for 'rubber' and 'sandals'.
Aspects of civilization through rubber in Kerala
The human culture changed in the primitive society with the emergence of agriculture. In the same way changes will happen in the society with the changes in the agricultural pattern and crops. Agricultural plugs a vital role in economy and the lives of people.

Civilization through rubber is a wide subject to study. Here try to find out the cultural factors of rubber in Kerala perspective. In 1902 and 1903 the British started rubber plantations in different parts of Kerala. During the twentieth century rubber plantations were extended for wide Kerala, either in large scale or in small scale. In Travancore the banks of Periyar, Konny and Mundakkayam; in Kochi Palappilly and in Malabar Thamarassery became dominant on rubber cultivation in this period.

According to the changes in farming the life style of the cultivators especially the tribes, also changed. These changes form an interesting aree of study. The Rubber Board conducted several programmes among the tribes to understand the importance of Rubber cultivation. From 1968 onwards Rubber cultivation is being undertaken in tribal settlements with the help of the Rubber Board. This scheme introduced in Kollam and Thiruvananthapuram districts were extended to other districts. It was started in the tribal settlements of Idukki during the year 1992. After the introduction of Rubber, the life style of the tribal community in Idukki has changed. The changes occurred in education, dress code, construction of houses and all other realms of life. No other community makes such a dramatic change in a short period by the cultivation of a crop. So the study about the magical effect of Rubber among the tribal settlements is more important.

Not only in the tribal settlements but also the other areas of our state, the living style of people may changed. So many Rubber related industries flourished in the state. Now Rubber plantations from the most commercialized sub sector of the agricultural sector. Modern management techniques and practices are effective in plantation industry. Rubber is used as the basic raw material in many industries. Kerala producers as much as $94 \%$ of the total production of natural Rubber in the country, So the living style of Kerala Society is much indebted to the Rubber Plantations of the State.

## CONCLUSION

Every society is undergoing endless changes. It mostly depends upon the economics status of the people. The economic uplift leads to social and cultural changes. The myths and beliefs may sometimes help the growth of the society. The archaeological evidences of rubber prove it.

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# Crisis in Plantation Industry and its Impact on Eco-tourism in Idukki District Kerala 

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# Crisis in Plantation Industry and it's Impact on Eco Tourism in Idukki District (Kerala) 

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#### Abstract

In Idukki agriculture is the main pursuit of the people. Beside this, the plantation like rubber, cardamom, coffee, tea and other cash crops enrich the economy and eco-tourism. The history of plantation in Idukki district begins with the advent of European planters. Kerala varma, the Raja of Poonjar sold 227 sq. miles of Kannan Devan hills to John Danial Monroe, a British planter. For the development of plantation in Idukki, planters started roads and other transport facilities were organized. Kannan Devan Hill Planters tea factory was started early in Idukki, following this, rubber plantation, cardamom plantation, coffee and tea plantation developed slowly. The plantation provides employment opportunities for a large number of people from various parts of Kerala and Tamil Nadu and also boosted the economy of the state. The state Agricultural Department's data shows that at any time, the price of any cash crops could tumble, pushing growers into deep social and financial crises. Idukki is one of the most nature rich areas of Kerala and also considered as a tourist paradise. Idukki offers diverse attraction like wildlife sanctuaries, hill stations, dams, spices plantation tour, mountain trek, elephant ride ect. Tourism in Idukki brings social, economic and cultural changes among the people. In further the eco-tourism in Idukki district very close to the plantation Industry, if the price falls of plantation crops causes for the decline of eco-tourism in Idukki. Due to the promotion of eco-tourism and plantation in Idukki district help for the cultural and economic exchange.


## INTRODUCTION

India is a leading country in area and production of plantation crops. Kerala is legendary land of plantation and spice crops. Plantation sector has been a key sector in exporting earning and employment generation. The total share of export earnings in the plantation sector declined over the years even today.

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 Peer Refereed International Journal ISSN 2249-8117, UGC approved Journal (64272)As a tourist destination, Idukki offers diverse attractions like wildlife sanctuaries, hill stations, dams, spices plantation tours, elephant ride etc. The cool climate in the district also makes it popular among the tourists, both foreigners and local people. The crisis in the plantation sector affects the tourism in Idukki. Kerala's history is closely linked with its commerce, which in turn was wholly dependent until recent times on its spice trade. Kerala was known for its spice and travelers around the world journeyed here to trade and to gain control over the rich land. It is believed that the spice trade dates back to three thousand years. Pepper still remains the king of Kerala's spices but Idukki also has a very rich produce in cardamom, cinnamon, nutmeg, mace, ginger and turmeric. As in the past, Idukki continues to be the spice capital of the world. The plantation sector in Kerala particularly tea, cardamom etc. is undergoing one of the worst crisis in the recent times, caused by dwindling commodity price and rising cost of production. The price fall has hit the high range region in Idukki district in Kerala; affect both corporate plantations and individual planters.

## Objectives of the Study

- To trace the development of plantation and eco-tourism in Idukki district
- To understand the crisis in plantation affect the eco-tourism in Idukki
- To identify the maj or problems faced by the plantation sector in Idukki


## Eco- Tourism In Idukki District

Idukki one of the important tourist destination in the world. Compare to other district of Kerala Idukki is the front runner of eco-tourism probable. Number of factors distinct Idukki from other mainstream destinations. Firstly the position of the Sahya Ranges, the boundaries of this district covered with the highest peak mountains and the large area of forest land. Plenty of sanctuaries and national parks and most of them arrange tours, jungle walk and safari for tourist. In Idukki the spectacular view is the Munnar hill station, specialized dairy farm, lush green carpet of tea. The cool climate of this dstrict also influenced foreigners as well as the local people. It is an experience to traveling to Idukki, offers a great combination of traditional and modern comforts. The brightly coloured flowers and tall green trees with their thick foliage create a good experience for nature lovers.

## Major Problems Faced by the Plantation Sector in Idukki

The major plantation crops of high range regions of Idukki district in Kerala is cardamom and tea. Today this sector faces severe threats to survival. The two main taluks like Peerumade and Udumbanchola lying at the south and north of Idukki district are tea areas. While the Udumbanchola taluk in the Middle East of the cardamom area. The present crisis greatly affected over a lakh of families of laboures, small agriculture farmers and planters etc. The major share of foreign exchange earnings of Kerala state contribution by the high range areas of Idukki. The plantation crops like pepper, cardamom, tea that grew in the high ranges. In pre-independence period Travancore rulers gave special attention to high ranges division and to ensure effective measures to the collection and marketing of spices. The current crisis had affected such a vast population including labourrs, traders, planters, tourist and all other section of the society. The important crises of plantation industry are.

## (1) Price Fall of Plantation Crops

The immediate Manifestation of the crisis related to the price of these crops. The studies indicated that the integration with world market under globalization has resulted in drastic increase in the volatility in the price of these crops because of the instantaneous transmission of price in the world market to the domestic market. Under Free Trade Agreement is another cause for the price fall, it also led to strengthened international completion. The price of all the plantation crops under consideration has been a downward trend during the last four to five years. Global recession and Mullaperiyar issues took their role and international tourists in 2009 are estimated to have dropped down by $2 \%$.

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## (2) Impact of climate changes

The climate change is one of the most important factors influencing year to year plantation crop production in Idukki district. The effort were made to study the impact on macro and micro climate factors in cardamom ecosystem in the high range of Idukki. The impact of climate change in CHR comprising of Udumbanchola, Devikulam and Peermade Taluks for a period of two decades (1990-1999, 2000-2009). The climate change influenced the cropping pattern of tea. World tea crop suggest that all the tea growing nations are experiencing adverse climate weather conditions resulting in lower production. Environmental factors like sunlight, moisture and temperature play a crucial role in the growth pattern of coffee. Even a slight deviation from the normal pattern can have great impact on the yields of coffee.

## (3) Issues of Plantation Worker's

The working and living condition of the plantation worker's especially women with low wages. They live in one room line houses with no sanitation and basic facilities like drinking water. There are no medical facilities. Tue chemicals used in plantation estates which may affect their health. Proper education is not providing to the children. The absent of trade union to represent their problem to the management. Due to absent of trade union the management turned their estate in to mini empires. They denied the minimum wages and also default in the worker's payment. The Plantation Labour Act (PLA) 1951 which regulates the working and living condition of worker's. It also prescribes standards for housing, health care and education regulates, working hours, overtime payment, child labour, paid leave and sickness of state to implement the Act.

## (4) Issue of Plantation Sector management

Failure of Management is a big problem, they did not plough back a part of the profit they made during the boom years for replantation and modernization, nor did they set up reserve fund for the time of crisis. Often non- professional managers have failed to innovate, control cost or adhere to good practices like proper pruning, periodic uprooting and replanting. The crisis in the plantation sector is due to falling commodity price and other allied ills. Since the trade liberalization Indian industry has to compete with international market.

## (5) Shortages of Skilled and Unskilled Labours

The plantation sector in Idukki district is experiencing a severe shortage of skilled and unskilled laborers. Those affected mainly the estate and unorganized farmers who depend on seasonal laborers especially for sowing and harvesting cash corps. Currently there is competition between estate for worker's when the harvesting season approaches and those who offer higher wages get the seasonal laborers.

## (6) Migrations of Labors

Idukki has recorded the highest total work participation rate as per both 1991 and 2001 censuses. The wide spread implementation of various poverty alleviation programms like IRDP, JRY, TRYSEM, etc. Another crisis the traditional labors mostly from Tamilnadu, either returned to their village or migrated to neighboring district. The women labours are mainly employed for plucking tea leaves and harvesting cardamom, men workers are employed for pepper harvest and on coffee estate. The low production and low price for pepper cannot employ workers who demands over 150 a day. The severe shortages are the rise in the cost of living in the state compared to that in Tamilnadu. Now the labour quarters on the tea estates and in cardamom and coffee plantation are lying vacant. When the National Rural Employment Guarantee Programme (NREGP) was implemented many workers choose it reducing their number in the plantation sector.

## Proposals for the survival of plantation sector

- Plantation crops to be given status of food crops or agriculture crops and note that of commercial crops. The current crisis of low price will be solved if people can carry it freely from Kerala to other state without any hindrances from tax officials.
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- Electricity tariff of irrigation and drying is in the commercial rate. Subsidies rate should be implemented as in the case of other agricultural produces.
- Promotion of new farming methods to reduce cost. Innovation in machinery, material and procedures to reduce the cost of plantation cultivation and promoted grants. Subsidies and incentives should be granted to individual and organization.
- Eco - tourism to be promoted in well organized and professionally managed manner in plantation area to provide additional income to farmers.
- Revisiting the structure and role of commodity board - establishment of commodity boards under the ministry of commerce for crops like tea, coffee, National rubber and spices with focus on export oriented or import substituting production could be considered as an appropriate institutional intervention at that point of time.
- Subsidies and incentives to be given to be individual and organization in producing bio-fertilizers and pest control agents. Facilities for testing and certifying quality of such products should be provided with in the state. Agricultural university and research centers at universities and college must be entrusted with such work.
- The crop insurance announced by GOI must be provided to all the farmers irrespective whether they have taken from bankers or not. The crop insurance shall be for each farmer's survey number.
- The price stabilization fond should be enhanced and effectively made use of to support the growers when crashes.
- It is proposed to have a separate agriculture budget in the parliament in the budget allocation for farmers and agriculture must be based on their population $55 \%$.
- Present schemes and incentives for poverty alleviation have to be relooked at by the state and the central government. In order to ensure supply of labour to the plantations.
- Training, skill up- gradation and welfare measures for addressing man power shortage.
- Strengthen extension wing of the commodity boards to disseminate the support and service at farm level.
- There shall be adequate representation of grower's organization in the wage negotiating committee.

In addition to the Proposals for the survival of plantation sector .1 know that some adequate measures implement in plantation sector such as. Higher position is always on spices production, insufficient storage facilities, lack of proper post - harvesting handling techniques, making of co-operative societies at village level, taluk level that will avoid involvement of middlemen, introduction of crop insurance facility, opening of processing units at village level.

## How to develop eco- tourism in idukki district

- Transport Facility Air: Nearest airports are Kochi and Madurai. Rail: No railway track in Idukki. Road: Idukki is well connected by roads. There are six state highways passing through the district.
- Accommodation Facilities in Idukki Accommodation facilities here include hotels and home stays. Hotels are run both by KTDC and private persons.
- To provide livelihood opportunities to local community through their involvement in services delivery through ecotourism.
- To facilitate the viability and performance of ecotourism enterprises and activities through effective marketing, education and training
- Should have participation of the local stakeholders (host community).
- Should be ecologically, socially, culturally and economically sustainable


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## CONCLUSION

So plantation industry and eco- tourism co related, if the plantation industry face crisis it also affect the eco- tourism. So we must protect the environment and its natural resources for the future generation. The success of ecotourism in Idukki district only through the balance between environment and local people. Due to the price fall of plantation crops advisedly affect the eco-tourism in Idukki, for example Peermade is the famous plantation town otherwise known as Kerala's Own Ooty, the price fall causes for the decline of foreigner's visited this place for the last four years. That is why I conclude that the government takes initiative to maintained plantation industry for the development of eco-tourism in Idukki.

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Scope of Eco-Friendly Agro Tourism in the Plantation Sector with Special Reference to Idukki District of Kerala

- Alias Mathew, James John


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# SCOPE OF ECO-FRIENDLY AGRO TOURISM IN THE PLANTATION SECTIOR WITH SPECIAL REFERENCE TO IDUKKI DISTRICT OF KERALA 

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#### Abstract

Kerala, the exotic spice capital of the world is also a very famous tourist destination in India. The unique geography, stunning, natural beauty and agrarian culture are the main factors that attract tourists to Kerala. Eco friendly tourism is defined as travelling to relatively undisturbed natural areas with specific objective of studying, admiring and enjoying scenery and its wild animals and plants as well as existing. Agro tourism is an innovative agricultural activity related to tourism and agriculture both. It has a great capacity to create additional source of income and employments to farmers. Eco friendly Agro tourism gives importance in protecting the environment in its natural state. Tourists got a chance to visit farms and lean farming methodologies. This article gives more importance to the tourism in the plantation sector with special reference to rubber plantation.


## INTRODUCTION

Kerala has 30.22 lakhs hectors of cropped area which is $56.78 \%$ of the total geographical area. More than $33 \%$ of the cropped area contains plantations of Tea, Coffee, Rubber, Pepper, Cardamom and Ginger. There is a possibility of converting potential cropped areas of the state as tourist attractions with minimum intervention. Various schemes are intended to prepare the plantations of Kerala to receive tourists by presenting a positive image to the agriculture sector of Kerala through tourism. Government had decided to allow $5 \%$ of the farm area for tourism purpose. It has been an encouraging factor for the tourism industry.

History of Kerala is closely linked with its commerce on its spice trade. Kerala was known for its spice and travellers around the world journeyed to trade and to gain control over the rich land. Idukki

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is one of the 14 districts of Kerala and it is one of the richest areas of Kerala. Idukki has a large population of tribal. Rubber Board proposed some projects to develop plantation in the tribal settlements. The article gives some more importance to rubber plantation and its eco-friendly aspects.
Rubber in Kerala: In India rubber plantation were first started tin Periyar in 1905, Since then many areas have been brought under rubber cultivation. Now a day's rubber dominates as a major crop of Kerala and it determines the economy of the people. Rubber is one of the most wonderful materials in the world and it helps for rapid advancement of modern civilization and science. In Kerala among the plantation crops most important one is rubber. The Booker Prize Winner Dr. Arundathi Roy's famous novel GOD OF SMALLTHINGS is very popular in the world. She select a place named 'Aymanam' in Kottayam district to tell the story. In the progress of the story rubber comes like a character in several times. It reveals, we cannot even tell a story by avoiding rubber.

## Plantation Tourism

Big rubber planters in Kerala, are planning to tap the tourist potential of their plantations, taking advantage of the recent government order. With the recent amendment to the land Reforms Act, plantation owners can construct hotels, resorts and other tourism projects in $5 \%$ of the plantation land owned by them. Kerala has an estimated 197542 (One Lakh Ninety Seven Thousand Five Hundred and Forty Two) hec of plantation land. By this amendment, as much as 9,874 hece, of land can be used for other purpose. Big planters own heritage building mostly built by the British, which could now be renovated and used for tourism. Most plantations are potential tourist hot spots, where you can add fun to your stay with swimming in shallow fresh waters, jungle walks and camp fire. In Kerala Idukki district is the front runner of ecotourism potential.

Part from boosting plantation tourism, the new low will help the planters, who are hit by steep fall in the prices of most plantation crops especially rubber to supplement their income by undertaking tourism related activities. If we travel across the green landscape of Gods own country you are sure to see acres of land covered with rubber plantations. These green zones are a beautiful sight for the visiting tourist in Kerala and are also a vital part of the economy of Kerala.

## Rubber plantation and Farm Tourism.

Kerala is leader in Rubber production among the states of India. Stay at a traditional farm house in the rubber plantation is a pleasureful experience. Enjoy the beauty of the plantation, go for nature walks and observe the birds, butterflies and squirrels amidst the plants in the rubber plantation in Kerala. Perhaps, no other state in India has the geographical diversity of Kerala. It consists of mountains, Midlands, and networked by about 44 rivers. An estimated 104 million house holds are dependent on Kerala's plantation sector. Kottayam District is famous for its plantation estates based on Rubber plantation. This mountainous district of Kerala is abundant with natural rubber which makes it one of the wanted destinations for Farm Tourism. Idukki is the best spot to enjoy both spice and farm tourism. The agro climatic condition in this hill station is suitable for cultivation crops like Fern, Rubber, Pepper etc. Basically the people of Idukki depend upon agriculture. The district lays second in agricultural producers. Farm tourism is helpful for the farmers to increase their income by promoting tourism activities. They can also market their products through farm tourism. The tourism have got different opportunities like a stay in a farm, to take part in plantation, a tour to these plantations and feeding of farm animals.

## Community Participation in Eco-Tourism

Community plays a vital role in eco-tourism development. Community based conservation is used in most of the wildlife sanctuaries. In order to win the local support for long term and conservation of biodiversity are the main goals of community participation. Local communities need to have some measures of control over them and share equitably in the benefits emerging from ecotourism activities. Kerala Tourism Development Corporation (KTDC) should encourage small scale local tourism enterprises for the benefits of both the foreign and domestic tourists. The collective attempt from local bodies and

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community in the ecotourism development activities in the Idukki District is very successful.
Limitations and Problems on Plantation Tourism:-
Plantation tourism development has been observed some problems. The initiatives carried out in the name of ecotourism have adversely affected people and the environment in some areas. Lack of proper infrastructure and minimum facilities causes the flow of tourists to plantations. Lack of adequate safety measure is another major problem. It is necessary that both domestic as well as foreign tourist can always enjoy their time under a peaceful atmosphere. Logging expansion of plantations is another problem confronting here. Some coffee plantations of Idukki District, which were further converted into tea or abandoned following the decline of production. Disproportional use of land and exploiting landscape are other problems. Huge quantities of waste are deserted aside the plantation roads. If proper measures are not taken it will become a major problems in the coming future. A clear strategy and operational system for waste disposal on eco friendly measures is needed.
The Economic Significance of Plantation Tourism in Idukki
The economic significance of plantation tourism in Idukki can be explained by using tourist statistics. The contribution of plantation tourism in Idukki district can be explained with the help of following tables.

Tale 1 - Tourist visits in Idukki District from 2000 to 2010

| Year | Domestic Tourist | Foreign Tourist |
| :---: | :---: | :---: |
| 2000 | 209639 | 24842 |
| 2001 | 324000 | 26571 |
| 2002 | 375820 | 29300 |
| 2003 | 420960 | 31831 |
| 2004 | 482183 | 46031 |
| 2005 | 473772 | 39378 |
| 2006 | 515182 | 31767 |
| 2007 | 505229 | 46463 |
| 2008 | 531970 | 51025 |
| 2009 | 429402 | 38185 |
| 2010 | 464123 | 48295 |

Source: Tourism, Statistics. Department of Tourism, Government of Kerala.
From the table 1 it is cleared that during 2000, the number of domestic tourists in Idukki District was 209639 and it is increased to 464123 in 2010. The number of foreign tourists visit in 2000 is 24842 nos is raised to 48295 in 2010. If positively affects to raise the economic condition of Idukki District and the Kerala State.

## GATT and Plantation Sector

The GATT agreement and to the Indian entry into WTO have led to the increased influx of foreign agricultural products into the country. The subsidies are also reduced. These factors have led to increased pressure on the farmers who are the backbone of the country's economy. The increased emphasis on environment protection and presentation of natural habitat by both developed and developing countries has led to fostering of plantation tourism activity in the primary tourist destination around the world.

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The agricultural sector in India, particularly plantation sector will be negatively affected by the ASEAN- India Free Trade. Responses from different sectors indicate that formers in the southern Indian states especially Kerala, particularly threatened by this deal. Kerala accounts for $91 \%$ of India's rubber. According to Association of planters of Kerala (APK), less productive plantations and relatively higher labour cost are making Kerala Plantations more valuable under ASEAN- India free trade agreement. This also affect plantation tourism and rubber based industry in Kerala. Rubber based industries make job opportunities for hundreds of people. The foreign travellers are interested to visit such production centres. It also nourishes our tourism sector.

## CONCLUSION

Tourism is a new sector of generating income and developing state economy. It will also generate employment. Plantation tourism causes socio-economic changes. Both administrative and policy related problems affected the development of plantation tourism in Kerala. Further attempts are needed in the God's Own Country to develop plantation tourism eco-friendly.
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# Generalized Inference for the Overlapping Coefficient of two Pareto Distributions 

- Sibil Jose, Seemon Thomas


# Generalized Inference for the Overlapping Coefficientof two Pareto Distributions 

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#### Abstract

This paper introduces a new method, called GPQ method, for the computation of overlapping coefficient of two Pareto distributions. Expected lengths and coverage probabilities of the confidence intervals are also calculated using the generalized pivotal quantity. The comparison of the method is done with the best available method, that is, bootstrap percentile method. The general performance of the proposed method is better than the existing methods. An illustrative example is also presented.


Keywords: Pareto distribution, Overlapping coefficient, Generalized pivotal quantity, Percentile bootstrap, Coverage probability.

## 1. Introduction

Overlapping coefficient (OVL) is a statistical measure used to measure the degree of overlap between two statistical populations. It is the common area under two probability density functions. Reference [1] measured the overlap of income distributions of White and Negro families in the United States using the formula:

$$
\begin{equation*}
\mathrm{OVL}=\int \min \left\{\mathrm{f}_{1}(\mathrm{x}), \mathrm{f}_{2}(\mathrm{x})\right\} d x \tag{1}
\end{equation*}
$$

where $f_{1}($.$) and f_{2}($.$) are the respective probability densities of the populations. Obviously, the value of OVL ranges$ from 0 to 1 , where a value 0 indicates that there is no overlap or similarity and a value 1 indicates that the two populations are identical or coincident. If the characteristic under consideration is discrete in nature, the integral in (1) can be replaced with summation. In the literature one can find other measures of OVL, see for example, [2], [3], [4] and [5]. Reference [6] used the concept of OVL in testing the equality of two Pareto distributions.

A researcher often wants to study the similarity of distribution of income in two populations. Pareto distribution is a heavy tailed distribution that is a good choice for modeling income above a threshold value. It is a good choice in insurance applications for modeling extreme loss. Reference [7] summarises the distribution of top incomes in the UK using Pareto models.

When the probability distribution under consideration contains two or more parameters conventional inference procedures may not be applicable as one cannot find a statistic that is free of these parameters. Usually, OVL is a function of two or more parameters and hence the statistic for OVL consists of nuisance parameters. So conventional methods based on sufficient statistics are not available and hence it is necessary to consider alternative methods to deal with the inference of OVL. In this study we apply the method of Generalized Pivotal Quantity (GPQ) proposed by [8] and [9] to obtain confidence interval for OVL of two Pareto distributions. Reference [10] constructed generalized confidence intervals for the OVL of two normal distributions with equal variance. Reference [11] constructed generalized lower confidence limit for the reliability function of two parameter exponential distribution.

## 2. OVL OF ONE-PARAMETER PARETO DISTRIBUTIONS

Consider two Pareto distributions with the following probability density function:

$$
f_{i}(x)=\left\{\begin{array}{c}
\alpha_{i} x^{-\left(\alpha_{i}+1\right)} ; x>1, \alpha_{i}>0 \\
0 ; \text { elsewhere }
\end{array}\right.
$$

for $\mathrm{i}=1,2$. Parameter $\alpha_{\mathrm{i}}$ is the shape parameter ('tail index') describing the heaviness of the right tail of the distribution, with smaller values corresponding to greater tail heaviness. We shall denote the OVL defined in (1) by $\rho$ and one can obtain the expression for $\rho$ in this case as given below:

$$
\begin{equation*}
\rho=1-r^{\frac{1}{(1-r)}}\left|1-\frac{1}{r}\right| \tag{2}
\end{equation*}
$$

where $r=\alpha_{1} / \alpha_{2}$. It is obvious that $\rho=1$ if $r=1$.

## A. GPQ Method

Let $X_{i j}, j=1,2, \ldots, n_{i}, i=1,2$ be two independent random samples of sizes $n_{1}$ and $n_{2}$ taken from two independent Pareto populations with parameters $\alpha_{1}$ and $\alpha_{2}$ respectively.
Define

$$
U_{i}=2 \alpha_{i} \sum_{j=1}^{n_{i}} \ln \left(X_{i j}\right)
$$

for $\mathrm{i}=1,2$. One can see that $\mathrm{U}_{\mathrm{i}} \mathrm{s}$ are independent chi-square random variables with $2 \mathrm{n}_{\mathrm{i}}$ degrees of freedom, $\mathrm{i}=1,2$. According to substitution method by [12], the corresponding GPQ for the parameter $\alpha_{i}$ is the following:

$$
\begin{equation*}
T_{\alpha_{i}}=\frac{U_{i}}{2 \sum_{j=1}^{n_{i}} \ln \left(x_{i j}\right)} ; \mathrm{i}=1,2 \tag{3}
\end{equation*}
$$

Note that (3) is independent of nuisance parameters and its observed value is the parameter itself. Thus the GPQ of the OVL, $\rho$ can be obtained by substituting (3) in (2).

## B. Bootstrap Percentile Method

In percentile bootstrap method we shall first generate b bootstrap samples, say $\mathrm{X}_{1}{ }^{*}, \ldots, \mathrm{X}_{\mathrm{b}}{ }^{*}$. In the next step estimate OVL values $\hat{\rho}_{1}{ }^{*}, \ldots, \hat{\rho}_{b}{ }^{*}$. Then identify $100(\alpha / 2)^{\text {th }}$ and $100(1-(\alpha / 2))^{\text {th }}$ percentiles of the $\hat{\rho}^{*}$ as the percentile points of $\rho$ and those points are taken to be the respective lower and upper limits of a 100 (1$\alpha) \%$ confidence interval for $\rho$.

## C. Simulation Study

TABLE 1 gives the estimated coverage probabilities of the confidence intervals using the GPQ and the percentile bootstrap methods for the OVL of two Pareto distributions. The $95 \%$ nominal level confidence interval is constructed for different sample sizes and parameter values. Numerical results are obtained using 10,000 simulated samples and are computed using R codes. For each simulated sample, 10,000 values of the GPQ are generated in order to compute the confidence limits and for the bootstrap method 10,000 parametric bootstrap samples are generated. It can be observed that GPQ based confidence intervals provide much better coverage for most of the sample sizes. If the value of $\rho$ is large, then the expected length of the GPQ intervals is found to be smaller than that of the percentile bootstrap intervals for almost all sample sizes.

TABLE 1. COVERAGE PROBABILITIES AND EXPECTED LENGTHS IN ONE PARAMETER CASE

| Parameters | $\left(\mathbf{n}_{1}, \mathbf{n}_{2}\right)$ | GPQ Method |  | Bootstrap Percentile Method |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Coverage | Length | Coverage | Length |
| $\alpha_{1}=1$ | $(2,4)$ | 0.9626 | 0.6590 | 0.9609 | 0.7183 |
|  | $(5,5)$ | 0.9515 | 0.5195 | 0.9517 | 0.5196 |
|  | $(10,10)$ | 0.9476 | 0.3628 | 0.9471 | 0.3628 |
| $\alpha_{2}=10$ | $(10,20)$ | 0.9529 | 0.3080 | 0.9475 | 0.3227 |
|  | $(20,20)$ | 0.9481 | 0.2515 | 0.9478 | 0.2516 |
| $\rho=0.3030$ | $(20,30)$ | 0.9460 | 0.2280 | 0.9445 | 0.2318 |
|  | $(50,50)$ | 0.9488 | 0.1568 | 0.9495 | 0.1569 |
|  | $(50,100)$ | 0.9523 | 0.1351 | 0.9507 | 0.1364 |
|  | $(100,100)$ | 0.9505 | 0.1103 | 0.9506 | 0.1103 |
|  | $(100,200)$ | 0.9543 | 0.0953 | 0.9499 | 0.0958 |
| $\alpha_{1}=2$ | $(2,4)$ | 0.9765 | 0.7617 | 0.9937 | 0.7398 |
|  | $(5,5)$ | 0.9751 | 0.5953 | 0.9749 | 0.5953 |
|  | $(10,10)$ | 0.9514 | 0.4590 | 0.9464 | 0.4171 |
| $\alpha_{2}=5$ | $(10,20)$ | 0.9625 | 0.4583 | 0.9742 | 0.5018 |
|  | $(20,20)$ | 0.9483 | 0.3921 | 0.9479 | 0.3921 |
| $\rho=0.6743$ | $(20,30)$ | 0.9464 | 0.3635 | 0.9449 | 0.3637 |
|  | $(50,50)$ | 0.9486 | 0.2590 | 0.9500 | 0.2590 |
|  | $(50,100)$ | 0.9527 | 0.2244 | 0.9510 | 0.2253 |
|  | $(100,100)$ | 0.9506 | 0.1834 | 0.9507 | 0.1834 |
|  | $(100,200)$ | 0.9542 | 0.1589 | 0.9538 | 0.1592 |
| $\alpha_{1}=4$ | $(2,4)$ | 0.9430 | 0.7399 | 0.9490 | 0.7311 |
|  | $(5,5)$ | 0.9609 | 0.5831 | 0.9607 | 0.5835 |
|  | $(10,10)$ | 0.9686 | 0.4358 | 0.9692 | 0.4380 |
| $\alpha_{2}=5$ | $(10,20)$ | 0.9721 | 0.3916 | 0.9827 | 0.3814 |
|  | $(20,20)$ | 0.9755 | 0.3288 | 0.9748 | 0.3239 |
| $\rho=0.9180$ | $(20,30)$ | 0.9742 | 0.3019 | 0.9798 | 0.2924 |
|  | $(50,50)$ | 0.9753 | 0.2208 | 0.9763 | 0.2209 |
|  | $(50,100)$ | 0.9762 | 0.1990 | 0.9743 | 0.2095 |
|  | $(100,100)$ | 0.9743 | 0.1695 | 0.9706 | 0.1563 |
|  | $(100,200)$ | 0.9765 | 0.1533 | 0.9804 | 0.1461 |

## 3. OVL OF TWO PARAMETER PARETO DISTRIBUTIONS

Let us consider two independent Pareto distributions with the following probability density function:

$$
f_{i}(x)=\left\{\begin{array}{c}
\frac{\alpha_{i} \beta_{i}^{\alpha_{i}}}{x_{i}^{\alpha_{i}+1}} ; x>\beta_{i}, \alpha_{i}>0 \\
0 ; \text { elsewhere }
\end{array}\right.
$$

for $i=1,2$. The point of intersection of the two probability density functions is the following:

$$
x_{0}=\left[\frac{\alpha_{1}}{\alpha_{2}}\left(\frac{\beta_{1}^{\alpha_{1}}}{\beta_{2}^{\alpha_{2}}}\right)\right]^{1 /\left(\alpha_{1}-\alpha_{2}\right)} \text { if } \mathrm{x}_{0} \in\left(\max \left(\beta_{1}, \beta_{2}\right), \infty\right)
$$

Then the OVL of the two probability density functions can be expressed as follows:
On simplification the final expression for $\rho$ reduces to:

$$
\rho=\left\{\begin{array}{l}
\left(\frac{\beta_{2}}{\beta_{1}}\right)^{\alpha_{2}}-\left(\frac{\beta_{2}}{x_{0}}\right)^{\alpha_{2}}+\left(\frac{\beta_{1}}{x_{0}}\right)^{\alpha_{1}} ; \beta_{1}>\beta_{2}  \tag{4}\\
\left(\frac{\beta_{1}}{\beta_{2}}\right)^{\alpha_{1}}+\left(\frac{\beta_{2}}{x_{0}}\right)^{\alpha_{2}}-\left(\frac{\beta_{1}}{x_{0}}\right)^{\alpha_{1}} ; \beta_{1}<\beta_{2}
\end{array}\right.
$$

Let $X_{i j}, \mathfrak{j}=1,2, \ldots, n_{i}, i=1,2$ be two independent random samples of sizes $n_{1}$ and $n_{2}$ taken from two independent Pareto populations. Let $\mathrm{X}_{\mathrm{il}(1)}$ be the smallest observation in the $\mathrm{i}^{\text {ith }}$ sample. Then the estimators of the parameters are the following (see [13]):

$$
\hat{\beta}_{i}=X_{i(1)}
$$

and

$$
\hat{\alpha}_{i}=n_{i}\left[\sum_{j=1}^{n_{i}} \ln \left(\frac{X_{i j}}{X_{i(1)}}\right)\right]^{-1}, \mathrm{i}=1,2 .
$$

Define,

$$
U_{i}=\frac{2 n_{i} \alpha_{i}}{\hat{\alpha}_{i}}=2 \alpha_{i}\left[\sum_{j=1}^{n_{i}} \ln \left(\frac{X_{i j}}{X_{i(1)}}\right)\right]
$$

and

$$
V_{i}=2 n_{i} \alpha_{i} \ln \left(\frac{X_{i(1)}}{\beta_{i}}\right), \mathrm{i}=1,2
$$

Note that $U_{i} s$ are chi-square random variables with $2\left(n_{i}-1\right)$ degrees of freedom and $V_{i} s$ are also chi-square random variables with 2 degrees of freedom. Then the GPQs of the parameters can be expressed as follows:

$$
\begin{gather*}
T_{\alpha_{i}}=\frac{U_{i}}{2\left[\sum_{j=1}^{n_{i}} \ln \left(\frac{x_{i j}}{x_{i(1)}}\right)\right]}, \quad \mathrm{i}=1,2  \tag{5}\\
T_{\beta_{i}}=x_{i(1)} \exp \left\{\frac{-V_{i}}{2 n_{i} T_{\alpha_{i}}}\right\}, \mathrm{i}=1,2 . \tag{6}
\end{gather*}
$$

Note that the probability distributions of (5) and (6) are free of nuisance parameters and their observed values are the respective parameters. Now the GPQ of $\rho$, say $T_{\rho}$, is obtained by substituting (5) and (6) in (4) according as $T_{\beta 1}>T_{\beta 2}$ or $\mathrm{T}_{\beta 1}<\mathrm{T}_{\beta 2}$ as the case may be. Then the $100(\alpha / 2)^{\text {th }}$ and $100(1-(\alpha / 2))^{\text {th }}$ percentile values of $\mathrm{T}_{\rho}$ will be the respective lower and upper limits of the $100(1-\alpha) \%$ generalized confidence interval for $\rho$.

## A. Simulation Study

TABLE 2 gives the results of a simulation study conducted to assess the performance of GPQ and percentile bootstrap methods in computing the coverage probabilities and expected length of the confidence intervals for $\rho$. The study is conducted for two different values of $\rho$. For each simulated sample, 10,000 values of the GPQ are generated in order to compute the confidence limits and for the bootstrap method, 10,000 parametric bootstrap samples are generated. It can be observed that GPQ method provide confidence intervals having much better coverage for $\rho$ and shortest expected length.

TABLE 2. COVERAGE PROBABILITIES AND EXPECTED LENGTHS IN TWO PARAMETER CASE

| Parameters | $\left(\mathrm{n}_{1}, \mathrm{n}_{2}\right)$ | GPQ Method |  |  |  | Bootstrap perc. Method |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Tail Coverage |  |  | Length | Tail Coverage |  |  | Length |
|  |  | Equal | Left | Right |  | Equal | Left | Right |  |
| $\alpha_{1}=3, \beta_{1}=2$ | $(20,20)$ | 0.9674 | 0 | 0.0323 | 0.1782 | 0.9373 | 0.0046 | 0.0581 | 0.3245 |
| $\mathrm{P}=0.2477{ }^{\alpha_{2}=2, \beta_{2}=1}$ | $(20,30)$ | 0.9658 | 0 | 0.0342 | 0.1735 | 0.9246 | 0.0030 | 0.0724 | 0.2825 |
|  | $(50,50)$ | 0.9591 | 0.0002 | 0.0407 | 0.1387 | 0.9386 | 0.0105 | 0.0509 | 0.2245 |
|  | $(50,100)$ | 0.9658 | 0.0004 | 0.0338 | 0.1136 | 0.9406 | 0.0063 | 0.0531 | 0.1717 |
|  | $(100,100)$ | 0.9521 | 0.0076 | 0.0403 | 0.1123 | 0.9480 | 0.0067 | 0.0453 | 0.1447 |
| $\begin{array}{cc} \alpha_{1}=1, & \beta 1=1 \\ \alpha_{2}=2, & \beta 2=2 \\ p=0.4375 & \end{array}$ | $(20,20)$ | 0.9452 | 0.0002 | 0.0546 | 0.2227 | 0.9581 | 0.0270 | 0.0149 | 0.3324 |
|  | $(20,30)$ | 0.9579 | 0.0012 | 0.0409 | 0.1825 | 0.9471 | 0.0411 | 0.0118 | 0.3323 |
|  | $(50,50)$ | 0.9467 | 0.0072 | 0.0461 | 0.1118 | 0.9454 | 0.0246 | 0.030 | 0.2052 |
|  | $(50,100)$ | 0.9555 | 0.0099 | 0.0346 | 0.0967 | 0.9457 | 0.0333 | 0.0210 | 0.1912 |
|  | $(100,100)$ | 0.9484 | 0.0135 | 0.0381 | 0.0807 | 0.9433 | 0.0268 | 0.0299 | 0.1471 |

## 4. EXAMPLE

To illustrate the method let us consider the data on the district wise per capita income of two states in India, namely, Kerala and Uttarakhand, for the financial year 2013-14. The values of 14 districts in Kerala are 114495, 84900, $104243,104424,114708,151210,96647,79552,71727,82243,72909,93906,65216,98246$ and the values of 13 districts in Uttarakhand are 59791, 90173, 85156, 122804, 91708, 69401, 79981, 86699, 105960, 68730, 72922, 122172, 115543. The Kolmogrov-Smirnov one sample test is used to check whether the data sets follow Pareto distribution. The maximum likelihood estimates of the parameters $\alpha_{1}$ and $\beta_{1}$ of Pareto distribution for the first data set are 2.8129 and 65216 repectively.. The value of K-S test statistic is 0.2128 against the table value of 0.314 corresponding to $5 \%$ level of significance. The maximum likelihood estimates of the parameters $\alpha_{2}$ and $\beta_{2}$ for the second data set are 2.5964 and 59791 respectively. The value of K-S test statistic obtained in this case is 0.2224 and the table value is 0.325 corresponding to $5 \%$ level of significance. Thus both the data sets follow Pareto distribution. The estimated value of the OVL of the two distributions is 0.7966 and the $95 \%$ confidence interval based on GPQ is ( $0.5555,0.9035$ ). Of course, an economist can make several inferences about these two populations based on the value of OVL.

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# Indian dream of triangular strategic partnership in middle east: complexities and possibilities 

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# INDIAN DREAM OF TRIANGULAR STRATEGIC PARTNERSHIP IN MIDDLE EAST: COMPLEXITIES AND POSSIBILITIES 

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The basic precepts of the foreign policy of a country rests on its competence in augmenting and consolidating power in international sphere. India is not an exception. India under the leadership of Sri. NarendraModi is trying to weave its own web across the tough terrain of foreign relations in the Middle East; where many players are acting as if hostile on multipronged reasons. The dream of having a triangular strategic partnership among Israel, Iran and Saudi Arabia is having much significance in this context. In this article the researchers are exploring the possibilities and prospects of a triangular relation among these countries and this may in turn redesign the foreign policy prospects of the middle-east.
Key words: triangular strategic partnership, foreign policy, Middle East, Israel, Saudi Arabia Iran India

## INTRODUCTION

Under Prime Minister NarendraModi , India has become an active player in international affairs and the PM has given due recognition to the strategic significance of the Middle East in the Indian security concerns. This is the chief reason why P.M Modi has visited all most all the important states in the Gulf Region within four years of his term in office. However the activism of the Indian interest in theMiddle East have started during the termof UPA Governments itself. Now India has recognized three states from the Middle East namely; Saudi Arabia, Iran and Israel as strategic partners in addition to maintaining closer ties with other states in Middle East. Thus India has created a strategic partnership triangle in the Middle East.

Historically Arab states have supported to anti-India rhetoric of Pakistan even though India was in favor of Arab cause. In the like manner India had no diplomatic ties with Israel till 1992.However the strategic position of India among the community of nations has appreciablychanged by the beginning of the new millennium due to certain specific reasons. Firstly, the US has increasingly perceived India's potential in balancing China. Secondly economic liberalization of Indiaandsubsequent economic growth. Thirdly Indian nuclear test in 1998 and open declaration as a nuclear weapon state. Fourthly matured response to Pakistani Provocation(Paul, 2008, p. 1). Fifthly the spread of international and cross border

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terrorism. Sixthly, the increased demand from India for crude oil. These developments in the sub-continent has prompted the Middle Eastern states to think more in favor of India as the emergence of the country from 'largely marginal player in the international system to a serious candidate or contender for major power status'(Paul, 2008, p. 1)

## Triangular strategic partnership in Middle East

India has announced her strategic partnership with Iran in January 2003 during the visit of Iranian president Mohammad Khatami to Newdelhi(MEA, Foreign Relations, 2016) and the strategic partnership with Saudi Arabia was announced in 2010 in the Riyaddeclaration during the visit of the then Prime Minister Manmohan Singh to Riyad.(Hussin, 2017). Wonderfully India elevated her relations with Israel as a strategic partner during the visit of PM Modi to Telaviv in July 2017. Thus India has created a strategic triangle but self-contradictory in the Middle East. The strategy behind the strategic partnership is to be examined carefully to evaluate its prospects and possibilities (Business Standard, 2017)

## Iran as a strategic partner

Iran a close 'ally' (Hathaway, 2004, p. 3) of Washington and Islamabad, has turned to be a neutral country in relation to India after the Islamic revolution in 1979.According to president Ram NathKovind,"We have had (close) cultural, economic and other relations with each other since the last many centuries" (NDTV, 2018). The Indo-Iranian relations has progressively improved due to the convergence of strategic goals of both countries in the central Asia and the south Asia. According to Robert M.Hathway 'Iran offers too many political and economic advantages for New Delhi' (Hathaway, 2004, p. 5)to do away with her traditional friends for a strategic partnership with India. Considering the geopolitical position of Iran, India has started increased engagements with Tehran despite of theUS opposition to the move. India consider Iran as a gateway to access landlocked states in central Asia and Afghanistan. Moreover on National security point of view a cordial relation with Tehran can serve India to futile the designs of 'Sino-Pak' access(Dasgupta S. , 2004, p. 23).For example, in 2003 India has agreed to develop the Chabar port in Iran at the shore of the gulf of Oman to increase trade with Afganisthan and central Asia through the territory of Iran (Fair, 2007, p. 273). The transit betweenAfganisthan and India via Pakistan has been objected by that country considering her traditional enmity to India and her security concerns. Moreover India consider theChabar port can be a counter weight to the Pakistani port of Gwador which is developed with the Chinese support. There are apprehensions in Islamabad and Karachi that 'Indian naval vessels' (Fair, 2007, p. 273) shall be deployed at Chabar port in the future. The 2500 kilometers long Iran Pakistan India gas pipeline project had to be abandoned due to demand of Pakistan for excessive transit charges. Energy security and defense cooperation have been identified as important strategic areas by both countries and the same has been reflected in the joint statements issued after submit level talks.It may be remembered that before the UN sanctions against Iran, she was the largest supplier of oil to India. Yet another important area of cooperation is counter terrorism.

Despite of the US sponsored UN sanctions against Indo-Iranian strategic partnership is continued to be unbroken. Summit level bilateral discussions are being conducted in regular intervals. PM Modi visited Iran in 2016 and Iranian president Hassan Rohanivisited India February 2018. Both countries have agreed up on the maintenance of peace in Afghanistan and both countries are worried up on the security of the minorities in Pakistan. As the Ministry of External Affairs says that 'dialogue between defense and National Security Council structures of the two countries (MEA, 2018)' is stillgoing on. Thus the convergence of views on several issues and common interests make both countries strategic partners and natural allies.

The depth of Indo-Iranian friendship is clear in these words of visiting Iranian president in February 2018.He said:"We, in the Islamic Republic of Iran, believe that the people of Iran and India have had friendly relations with each other" (NDTV, 2018).After the visit of the Iranian president to New Delhi
the Indian minister of external affairs declared that 'It was agreed to move beyond traditional buyerseller relationship and develop it into a long term strategic partnership'(MEA, 2018)'.

The Oil rich kingdom of Saudi Arabia and India have become strategic partners and has been maintaining high level political engagements ever since the declaration of the partnership in 2010. Indo Saudi strategic partnership covers a wide range of area including 'economic issues, trade and investment issues, those relating to energy security, investments in each other's country in upstream and downstream energy activities and investments in renewable energy resources(Kumar, 2010)'. While returning, after the Saudi visit in 2010, the then prime minister Dr. Manmohan Singh on board said to the news persons that 'the strategic partnership with Saudi Arabia would also cover issues relating to security, cooperation in dealing with terrorism and arrangements for information and intelligence sharing(Kumar, 2010) 'India and Saudi Arabia have signed an extradition treaty and agreed up on certain counter-terrorism measures. 'The 2010 Riyadh Declaration was an add-on to the previous declaration. It paved the way for India to take a giant leap taking the relations with Saudi beyond oil and trade in order to engage the partner nation in a strategic partnership(Alam \& Ahmad, 2015, p. 333)'.

Saudi has to make India a strategic partner because of certain commercial factors as well.The findings of economically viable shell deposits in US mainland and Russian sale of natural gas to China have shrunken Saudi's Oil market(Ahmad T. , The Gulf Region, 2015, p. 444). The growing economy of India required cleaner and reliable energy security. Thus the convergence of Oil interests of both countries together with national security interests have prompted them continued to be strategic partners. Thus Saudi Arabia supplies the largest quantity of Oil to India.Again "Riyadh is concerned about the rise of extremism in the region, including in Pakistan, notwithstanding their close ties" (Hindu, 2013). Saudi had no hesitation to 'condemn' (Quamar, 2017)the Uri terrorist attack in 2016.

An important component of the partnership is defense cooperation between the two countries and important agreements were signed in this regard during the visit of crown prince Salman bin Abdulaziz Al Saudto New Delhi in 2014 and PM Modi's visit to Riyadh in 2016. "Delhi and Riyadh also agreed on the need to intensify bilateral defense cooperation, through the exchange of visits by military personnel and experts, conduct of joint military exercises, exchange of visits of ships and aircrafts and supply of arms and ammunition and their joint development"(Chaudhury, 2016). Intelligence sharing, investment, safety of Indian expatriates, Trade and commerce, cultural relations etc. have been identified as areas of cooperation between the two giants of their respective regions. Furthermore during the visit of external affairs minister SushamaSwaraj in February 2018 it was decided to take "Steps to further intensify our strategic partnership in all sectors and to work together towards each other's progress. ${ }^{\text {'To }}$ showcase the growing partnership between India and Saudi, India has been invited as the guest of honor in the Janadriyah festival 2018 conducted in Riyadh by Saudi government. As Nicolas Blarrel rightly said, "The Gulf and the Arab countries are no longer just a source of oil and destination for Indian labour; they have also become economic and political partners"(Blarel, The Evolution of India's Israel Policy, 2015, p. 356).

## Israel as a strategic partner

It is well known that India has established diplomatic ties with Israel only in 1992 and until the establishment of diplomatic ties India had been a constant critique of Israeli policies. In the UN India voted against the partition of Palestine and the creation of a Jewish state. Once India established diplomatic lies with Israel, their relations have flourished dramatically and high level political and official level contacts have been arranged between the two countries. When PMModi visited Israel in July 2017 India had elevated her relations with Israel as 'strategic partners'(Hindu, 2017, p. 8) and declared the limit in Indo-Israeli relations as the 'sky' (Inbari P. , 2017, p. 1).

The convergence of Indo-Israeli interests are clearly visible in the area of defense, intelligence sharing, counter terrorism, science and technology and so on. India has launched an Israeli 'spy satellite'? and there are apprehensions in Pakistan that out of the five nuclear tests conducted by India in 1998 'two

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were done for Israel' (Noor, 2004, p. 97).The transfer of defense technology and purchase of defenseequipment is an important component of strategic partnership. The up gradationof the ageing Soviet defense hardware and transfer of technology for the same is offered by Israel (Blarel, 2013, p. 167).

The depth of Indo- Israeli relations in the recent times is clearly visible when Prime MinisterModi avoided 'Ramallah'(Inbari P., 2017, p. 1) the headquarters of Palestine authority during his visit to Israel in July 2017. India had procured three Phalco AWACS, Israeli radars mounted on Russian I:-76 transort aircraft, in 2003 (The Hindu 2016) and decided to purchase two more in 2017."Beyond the upgrade and the sale of spare parts, Israel was also willing, unlike the US or other alternative suppliers in Europe, to share technology and to set up joint ventures for defense manufacturing".(Blarel, 2015, p. 280)

As an indication of Indo-Israeli friendship and strategic partnership, theTeen MurtiChauk has been 'renamed' (Sengupta, Teen Murti chowk renamed after Israeli city Haifa, 2018, p. 9)(Chronicle, 2018) as the Teen Murti-Haifa Chauk during the visit of Israeli Prime Minister Benjamin Nethanyahu to New Delhi in January 2018. During his visit he condemned terrorism in strong language and supported Indian position of Kashmir.(Deccan Cronicle, 2018)

## Complexities and Possibilities

Complexities and possibilities within the strategic partners of India and their bilateral relations to India are interesting for analysis. When the strategic partnership is analyzed in relation to Indo- Pak relations, the things can become more complex. The scope of such an analysis is very vast and deep. The complexities in the bilateral relations between India and the partners are narrow and possibilities both negative and positive are broad. But when the relations among the three partners is considered, they are bilaterally inimical to one another.

Saudi and Iran are considering one another as 'existential threat' (Ahmad, 2015, p. 444) andSunniShia differences are there, both wants to contain one another influence in the region. In the like manner, The Islamic republic of Iran and the Jewish state of Israel both fears and hates one another and suspicious on one anotheralliances and projects. The kingdom of Saudi Arabia and Israel are divided on the question of Palestine. The same kind of competition and enmity are maintaining among the three west Asian strategic partners of India in the matter of trade, energy, security and so on. The three partners doesn't have diplomatic ties among one another.

In a hypothetical situation of another war between India and Pakistan, the bilateral relations between India and partners may change as India is a 'strategic partner' to Saudi and Pakistan is a 'strategic allies' (Pradhan, 2016) to them as the Saudi foreign minister Al Jubir explained it. Here there is an important question whether Saudi shall support her strategic partner or strategic allies. Again, if Iran support India, Saudi shall either support Pakistan or become neutral. If so, the supply of oil from Saudi shall come under question mark. Meanwhile Iran cannot supplement the entire Indian demand of oil because of the existing UN sanctions against it. Such a situation can upset Indian strategic calculations. On another hand if Saudi supports India full heartedly, Iran shall turn in favor of Pakistan. It might harm Indian interest in Afghanistan and Central Asia.

When India's new strategic partner Israel support India full heartedly. Both Saudi and Iran may turn their faces against India.In such a situation energy security may be hampered. . More over India Israeli alliance may be interpreted as an anti-Islamic alliance and may escalate the situation into a major security threat to the entire world peace. If India turns against Israel to appease the Arabian states the supply of high technology military hardware may be intercepted. Indo Israeliprojects of joined production of arms and military hardware should be abandoned and can affect the striking and defense capabilities of our armed forces. In such a situation other western allies of Israel may not support India as well.

In a future Indo-Sinowar a strategic triangle in Middle East may not support Indian interest. The Indian strategic partners in Middle Eastcannot surpass Chinese interests over Indian interests because of
her special position in UN, world economy and security prospects. Iran is always depend up on Chinese veto in UN.Even though china and Israel are not strategic partners their relations are cordial ever since the establishment of diplomatic ties in 1992. Even though Saudi is showing more inclination to US, she supplies oil to china as well. So the behavior of strategic partners in such a hypothetical situation is so complex and cannot be predicted.

If the burning issue of Palestine escalates into an Arab Israeli war the strategic triangle may be affected. Traditionally even though India is in support of the people of Palestine, the Arabs may not expect such a support from India any more. Neutrality may be the future strategy of India on the question of Palestine. If India supports Palestine in its traditional vigor Israel may not accept Indian position and might sever the strategic partnership. In the same manner if India observe neutrality on the question her Arab partners such as Saudi and Iran might consider it as an unfriendly act to them. The net result may be the collapse of the triangular partnership

In a positive way of thinking the triangular strategic partners of India in the Middle East can improve Indian security scenario and her status in the world affairs. Two important countries of Islamic world are now Indian strategic partners and can work as a 'counter weight' (Pant H. , 2016) to Pakistani propagandas against India in the Islamic world. 'Pakistan has historically played the religious card to isolate India from Muslim states' (Quamar, 2014, p. 210) to promote her own interests.

A trusted and reliable arms supplier that is Israel is now available to India as a strategic partner so that supply of arms can be ensured at a time of crisis. It is noteworthy that Israel supplies arms to India in Indo-china war of 1962.and Indo-Pak wars up toKargilconflict in 1999(Singh S., 2017, p. 10).It may be remembered thatwestern powers including US haven't provided sincere support to India in these crisis.In the matter of energy security at least one line of supply of oil is now ensured either from Saudi Arabia or from Iran even in a war time situation. Again the development of chamber port in Iran by India ensure surveillance of ships in the gulf of Oman and can provide both Indian commercial and naval ships
anchorage there.

The triangular partnership has improved the balance of power in south asiain favor of India. Pakistan is not at all happy about these developments. Pakistan has made it clear to Iran that she should accept either India or Pakistan as a friend. Right now Iran has accepted India as her best option. The strategic relations between India and Saudi opens new avenues for Indian expatriates in Saudi and now they are more honored in Saudi Arabia.MeanwhileSaudi business men get new opportunities for business and investmentin India. People to people contact between India and Israel has been improved largely in the recent times. The Jewish business men are looking up on India as a safe haven for business and investment. India maintains excellent relations with all the three partners in connection with intelligence sharing and counter terrorism measures. Indian intelligence agencies are closely working with Saudi Iranian and Israeli intelligence agencies to collect and share information against terrorism, drug and human trafficking, smuggling etc.

## CONCLUSION

When moving deep into the complexities and possibilities of Indian dream of strategic partners in
Middle East we can dig more important facts and materials to prove that it is a game on string. The international scenario at the time of a crisis can only decide whe to prove that it is a game on string. The The complex and fluid nature of international situation decide whether the pendulum is in our favor or not. shall determine the future and success of the situation in the light of politics in Middle East and south Asia China have also a stake in the stability of the triangular partnership. The actors such as US, Russia and commerce, economy etc. shall also infludian strategic triangle. Furthermore terrorism, energy security, factors of the four nations and their political will can shall and success of the partnership. The domestic Minister Modi's activism in the foreign policy is a force be the strength of the partnership as well. Prime

As already stated the contradictions and force behind the sustainability of the strategic triangle
As already stated the contradictions and complexities of the triangle is the major challenge
before the strategic analyst in the country. For example, to India the 'epicenter of terrorism is Pakistan' while to Israel it is 'Iran' (Chronicle, 2018, p. 8). But India considers Iran as a strategic partner. As KanwalSibal says "The tensions over Iran's nuclear programme, our vote against them in the IAEA, the imposition of US/EU sanctions on Iran and the deterioration of the country's relations with the US just when India-US relations have improved very considerably, has made the strategic handling of our relations with Iran difficult" (Sibal, 2013, p. 12). Similarly Indian position on the question of Palestine and status of Jerusalem puts the shadow of doubt on India by Israel. Saudi's support to Pakistani position on Kashmir creates uneasiness to India. Anti-Saudi rhetoric of Iran may also be remembered in this context.

In strategic terms the triangular strategic partnership in Middle East is an excellent concept. However the practical applicability of the concept is in vain. The foreign policy activism of PM Modi can maintain the partnership as a reality. But Indian foreign policy towards Middle East should be more sensitive and careful so that the sentiments of each and all partners should be respected. Unnecessary complexities and confusions in the foreign policy for West Asia should be excluded. Thus the negative marks should be minimized and positive marks should be maximized to remain the dream as a practical reality.

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Sonerilaraghaviana Ratheesh et al - a new Disributional Record for Kerala, India

- E.J.Josekutty, P. Biju, Jomy Augustine

Research Article

# SONERILA RAGHAVIANA RATHEESH ET AL (MELASTOMATACEAE)-A NEW DISTRIBUTIONAL RECORD FOR KERALA, INDIA 

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## Key words:

Endemism, Kannur district, Paithalmala, Sonerila.


#### Abstract

Sonerila raghaviana a recently described species from the state of Karnataka is collected from Paithalmala, Kerala is reported as a new addition to the flora of Kerala. Brief description along with notes on habitat, distribution, conservation status are provided along with colour image.


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## INTRODUCTION

The genus Sonerila Roxb. is mostly distributed in the tropical Asia and represented by about 175 species (Lundin \& Nordenstam, 2009, Deepikakumari \& Pandurangan,2014). The members are mostly herbaceous, and are found along the wet places in grasslands, streams, rocks before summer. In India the genus is represented by 52 species (Deepikakumari \& Pandurangan, 2016) among which a good number are found in the Western Ghats. Recently a few species has been described newly from South India including S. raghaviana Ratheesh et al (2013).The species was so far collected only from two localities from the Thalacauvery Hills of Coorg District of Karnataka. In 2015, during an exploration trip to Paithalmala of Kannur District, Kerala, the authors collected Sonerila specimens from the grasslands. The detailed study confirmed it as $S$. raghaviana Ratheesh et al and is reported as addition to the flora of Kerala.

## Taxonomy

Sonerila raghaviana Ratheesh, Sunil, Nandakumar \& Shaju, Int. J. of Advanced Research 2:10 772-777. 2013.

Scapigerous herbs, c. 12 cm high. Rhizome short, leaves radical, 3-5 per plant, orbicular, 3.5-6x 3.3-5.5 cm , apex subacute, base cordate, margin serrate, pilose hispid above, glabrous except veins below, basally 7-nerved, impressed above, raised below, pinkish below; petiole $3-5 \mathrm{~cm}$ long,

[^4]sparsely hispid, pinkish. Scapes 1-3, 6-10 cm long, tetragonous, glandular hispid, deep pink; flowers c. 1.8 cm across, in scorpioid cymes, $10-14$, pedicellate, pedicel c. 5 mm long, thick, villous, terete. Hypanthium urn shaped, dense glandular bristly, $3-5 \times 2-3 \mathrm{~mm}$, ridged, greenish pink; lobes 3 , triangular c. 1 x 1.5 mm , apex acute, glandular hispid. Petals 3, obovate, $8-10 \mathrm{x}$ 6-7 mm, apex mucronate, glabrous above, midrib with few glandular bristles below, pinkish-rose. Stamens 3, filaments 3-4 mm long, glabrous, pinkish; anther c. 2 mm long, bright yellow, base sagitate, acuminate. Ovary trilocular, placenta swollen axile, ovules many; style 5-6 mm long, glabrous; stigma capitate, deep purple, rugose. Capsules urn shaped, $4-6 \mathrm{~mm}$ long, prominently ridged, densely glandular bristly, greenish. Seeds many, ovate-oblong, brownish.

Specimen examined: 1643, 29.08.2015, Paithalmala, Kannur District, Kerala, India, $\pm 1060 \mathrm{~m}$, coll. Josekutty \& J. Augustine (deposited at St. Thomas College Herbarium, Pala, Kottayam (STCP) (Figure 1)

Distribution: India: Karnataka (Coorg District) \& Kerala (present report); endemic to Western Ghats.

Habitat: Occasional in grasslands, usually around isolated rocks.

Flowering and Fruiting: July-September

## Notes

Sonerila raghaviana Ratheesh et al is endemic to Western Ghats and show highly restricted distribution. They are mostly
found along Brahmagiri ranges at higher altitudes in Karnataka (Thalacauvery (Type locality), Thadiantamol) at altitudes above 1000 m a. s. 1 . The present collection is from the montane grasslands 1000 m a. s. 1 . in Paithalmala, Kannur District, Kerala. The habitat is subject to anthropogenic wildfires in summer and the plants around the rock margins and crevices alone survive. Since the species has restricted distribution under vulnerable habitats, the species can be considered threatened and need further study to evaluate the IUCN Status.


## Acknowledgements

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Figure 1 Sonerila raghaviana Ratheesh et al Habit

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# A Customer Centric Study on GST in Insurance and Automobile Sector 

- Mathew Abraham

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## Sisekum Cinemayum

- Thomas Scaria



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## Cinema -Mathavumayulla Saadharmyavum Yadharthyavum

- Salvin K Thomas



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# Modeling of Agricultural Price Data Using Hidden Markov Model 

- Joshni George, Seemon Thomas


# Modeling of Agricultural Price Data Using Hidden Markov Model 

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#### Abstract

In this paper, we explore the application of hidden Markov model (HMM) in the modeling of agricultural price data. Normal hidden Markov model is fitted and compared with univariate autoregressive moving average (ARMA) model. The parameters of the model are estimated using EM algorithm and the sequence of hidden states are obtained based on the best fitted model.


Keywords: Markov Process, Transition Probability Matrix, Stationary Distribution, Decoding

## 1. Introduction

Agricultural prices are highly volatile as they are largely influenced by so many unpredictable and irregular factors that are random in nature. Presently the agricultural prices are determined by the domestic and international market forces. Therefore price forecasting is a challenging and difficult task due to the stochastic and irregular form of the price.

The two data sets considered in this study are the global monthly average price of banana during the period January 2011 to December 2016 and local price of banana during January 2013 to December 2017. During the past few decades, one of the most important and widely used time series model for price forecasting is the ARMA model which is based on normal distribution. The time series data of global and local banana prices have kurtosis less than that of a normal distribution. In this situation, we explore the possibility of applying hidden Markov model (HMM) in the modeling of banana price and compare it with ARMA model, the most commonly used model for the analysis of price data.

## 2. HIDDEN MARKOV MODEL

An HMM is a stochastic model with an underlying Markov process that is not directly observable. But the process can be observable through another stochastic process that depends on hidden states constitute a sequence of observations. The theory of HMM was introduced by [1] as an extension to the first order Markov process. In the late 1980s and early 1990s, HMMs were introduced to computational sequence analysis [3] and applied HMM in DNA sequence analysis. HMMs have been widely used in modern continuous speech recognition systems [5], biological sequence analysis [4], speech recognition [8], computational finance [7], gene prediction [6] etc. A description of parameter estimation of HMMs can be found in [2]. An elaborate discussion of the theory, application and computation of the HMMs are available in [10].

In an HMM, the states are not directly visible, but the output depends on hidden states is observable. Let $\left\{S_{t}: t=1,2, \ldots\right\}$ represents the unobserved parameter process satisfying Markov property. Let $\left\{Z_{t}: t=1,2, \ldots\right\}$ is the state-dependent process such that, when $S_{t}$ is known, the distribution of $Z_{t}$ depends only on current state $S_{t}$ and not on previous states.

Let $p_{i}(z)$ be the probability density function of $Z_{t}$ if the Markov chain is in the current state $i$ at time $t$.

That is

$$
\begin{aligned}
& p_{i}(z)=P\left(Z_{t}=z \mid S_{t}=i\right) . \\
& \text { Now define } u_{i}(t)=P\left(S_{t}=i\right) \text { for } t=1, \ldots, n \text {. Then } \\
& P\left(Z_{t}=z\right)=\sum_{i=1}^{m} P\left(S_{t}=i\right) P\left(Z_{t}=z \mid S_{t}=i\right) \\
& =\sum_{i=1}^{m} u_{i}(t) p_{i}(z) \\
& =\left(u_{1}(t), \ldots, u_{m}(t)\right)\left(\begin{array}{ccc}
p_{1}(z) & & 0 \\
0 & \ddots & p_{m}(z)\left(\begin{array}{c}
1 \\
\vdots \\
1
\end{array}\right) \\
= & \mathbf{u}(t) \mathbf{P}(z) \mathbf{1} .
\end{array}\right.
\end{aligned}
$$

where $\mathbf{u}(t)=\left(u_{1}(t), \ldots, u_{m}(t)\right)$ is the initial distribution of the Markov chain, $\mathbf{P}(z)$ is the diagonal matrix with $i^{\text {th }}$ diagonal element $p_{i}(z)$ and $\mathbf{1}=(1 \ldots 1)$. If $\mathbf{u}(t)$ is the initial distribution and $\boldsymbol{\Gamma}=\left(\gamma_{i j}\right)$ is the transition probability matrix of the Markov chain such that $\sum_{j=1}^{m} \gamma_{i j}=1$ and $\gamma_{i j} \geq 0$. Then the distribution at time $t+1$ can be given as follows:

$$
u(t+1)=u(t) \Gamma
$$

If the Markov chain has stationary distribution $\boldsymbol{\delta}=\left(\delta_{1} \ldots \delta_{m}\right)$, then $\boldsymbol{\delta} \boldsymbol{\Gamma}^{t-1}=\boldsymbol{\delta}$ for all $t \in \mathrm{~N}$ and hence

$$
\mathbf{P}\left(Z_{t}=z\right)=\boldsymbol{\delta} \mathbf{P}(z) \mathbf{1}
$$

If $z_{1}, z_{2}, \ldots, z_{n}$ is the observation sequence generated by an HMM and $\boldsymbol{\delta}$ be the initial distribution which is assumed to be the same as the stationary distribution implied by the transition probability matrix $\boldsymbol{\Gamma}$, then the likelihood function is the following:

$$
\begin{equation*}
L=\delta \Gamma \mathbf{P}\left(z_{1}\right) \boldsymbol{\Gamma}\left(z_{2}\right) \ldots \boldsymbol{} \mathbf{P}\left(z_{n}\right) \mathbf{1} . \tag{1}
\end{equation*}
$$

## A. Normal-HMM

Consider an m-state HMM with a Markov chain having transition probability matrix $\boldsymbol{\Gamma}$, stationary distribution $\boldsymbol{\delta}$ and univariate normal state dependent distribution

$$
p_{i}(z)=\left(2 \pi \sigma_{i}^{2}\right)^{-1 / 2} \exp \left(-\frac{1}{2 \sigma_{i}^{2}}\left(z-\mu_{i}\right)^{2}\right) ; \quad-\infty<z<\infty,-\infty<\mu_{i}<\infty,
$$

and $\sigma_{i}>0$. The parameters are estimated using EM algorithm. A detailed description of the iterative procedure involved in EM algorithm is available in [10]. The appropriate number of states $m$ is decided on the basis of Akaike information criterion (AIC) and Bayesian information criterion (BIC) values. AIC and BIC are defined as follows:

$$
\begin{aligned}
& A I C=-2 \log L+2 p \\
& B I C=-2 \log L+p \log n
\end{aligned}
$$

where $\log L$ is the log-likelihood of the model, $p$ is the number of parameters and $n$ is the total number of observations. The mean and variance of the distribution $p_{i}$ is given below.

$$
\begin{align*}
& E\left(Z_{t}\right)=\sum_{i=1}^{m} \delta_{i} \mu_{i}=\boldsymbol{\delta} \boldsymbol{\mu}^{\prime} \\
& \operatorname{Var}\left(Z_{t}\right)=\sum_{i=1}^{m} \delta_{i}\left(\sigma_{i}^{2}+\mu_{i}^{2}\right)-\left(\delta \mu^{\prime}\right)^{2} \tag{2}
\end{align*}
$$

Using Viterbi algorithm, a decoding algorithm for finding the most likely sequence of hidden states conceived by [9], one can find the best state sequence with respect to the sequence of observations which maximize the likelihood function (1).

## 3. MODELING OF BANANA PRICE

A. Global Price

The data given in Table I is the monthly average global price of banana per metric tonne in USDollar during the period January 2011 to December 2016. The data is available at https : //fred.stlouisfed .org/series/PBANSOPUSDM .

TABLE I. GLOBAL BANANA PRICES FROM JANUARY 2011 TO DECEMBER 2016 IN USD/METRIC TONNE.

| Year | Jan | Feb | Mar | Apr | May | Jun |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2011 | 949.42 | 1013.12 | 994.17 | 1013.47 | 1022.10 | 986.31 |
| 2012 | 942.99 | 1045.12 | 1151.43 | 1029.33 | 955.44 | 956.33 |
| 2013 | 933.82 | 925.41 | 938.57 | 912.23 | 908.00 | 911.60 |
| 2014 | 928.42 | 946.13 | 966.85 | 945.50 | 916.00 | 926.07 |
| 2015 | 911.60 | 966.85 | 1045.96 | 1059.14 | 946.79 | 929.18 |
| 2016 | 1011.25 | 1052.35 | 1020.90 | 998.09 | 987.57 | 993.22 |
|  | Jul | Aug | Sep | Oct | Nov | Dec |
| 2011 | 964.22 | 960.25 | 945.50 | 956.33 | 959.32 | 946.76 |
| 2012 | 966.85 | 954.84 | 966.85 | 959.04 | 937.34 | 945.80 |
| 2013 | 925.41 | 937.60 | 939.23 | 936.82 | 922.13 | 925.41 |
| 2014 | 930.82 | 961.59 | 925.41 | 922.41 | 904.70 | 908.60 |
| 2015 | 938.33 | 956.66 | 951.78 | 933.58 | 932.32 | 932.32 |
| 2016 | 1004.67 | 1051.53 | 1013.31 | 976.39 | 959.94 | 959.94 |

The autocorrelation function (ACF) of the data given in Table 1 is given in Fig. 1.


Figure 1. ACF of Global Price

The banana price series has a kurtosis of 2.7021 which is less than that of a normal distribution. In addition, the price series shows serial correlation for the first lag. In this situation, we model the price data using normal mixture models, assuming both independent observations and Markov dependent mixture models, known as normal-HMM. Let us fit normal-HMM with two, three and four states and Box-Jenkin's ARMA model to the data. Fitting of a normal-

HMM involves estimation of $\boldsymbol{\delta}, \boldsymbol{\mu}, \boldsymbol{\sigma}$ and $\boldsymbol{\Gamma}$ by maximising the likelihood function (1). AIC and BIC values of each fitted model are given in Table II.

TABLE II. COMPARISON OF FITTED MODELS BY AIC AND BIC.

| Model | $-\log \mathrm{L}$ | AIC | BIC |
| :---: | :---: | :---: | :---: |
| 2-state HMM | 345.8483 | 701.6966 | 713.0799 |
| 3-state HMM | 332.8115 | 687.6230 | 712.6664 |
| 4-state HMM | 330.7309 | 699.4618 | 742.7185 |
| ARMA(1,1) | 347.8700 | 703.7400 | 712.8400 |

On comparing AIC and BIC values one can see that 3-state normal-HMM is the best fitted model. For the fitted 3state normal-HMM, the estimate of the transition probability matrix $\boldsymbol{\Gamma}$ obtained is the following:

$$
\boldsymbol{\Gamma}=\left(\begin{array}{lll}
0.8319 & 0.1113 & 0.0568 \\
0.2350 & 0.6491 & 0.1159 \\
0.0000 & 0.1961 & 0.8039
\end{array}\right)
$$

The corresponding estimates of $\boldsymbol{\delta}, \boldsymbol{\mu}$ and $\boldsymbol{\sigma}$ are shown in Table III.
TABLE III. STATIONARY DISTRIBUTION AND PARAMETERS OF 3-STATE NORMAL-HMM.

| Parameter | State 1 | State 2 | State 3 |
| :---: | :---: | :---: | :---: |
| $\boldsymbol{\delta}$ | 0.4119 | 0.2946 | 0.2935 |
| $\boldsymbol{\mu}$ | 927.6933 | 956.1636 | 1020.9425 |
| $\boldsymbol{\sigma}$ | 12.1558 | 7.8888 | 39.2086 |

The mean and variance of 3 -state normal-HMM computed using equations (2) are 963.4493 and 2042.8030 respectively. Note that these values are very close to the sample mean 963.2601 and sample variance 2040.2260 .

Prediction of the most likely sequence of Markov states given the observed data set (decoding) of 3-state normalHMM is done using Viterbi algorithm and is given in Table IV.

TABLE IV. THE MOST LIKELY SEQUENCE OF HIDDEN STATES OF 3-STATE NORMAL-HMM.

|  | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2011 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| 2012 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| 2013 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2014 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| 2015 | 1 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 |
| 2016 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 |

The state predictions of banana prices in the months of the year 2017 based on 3-state normal-HMM is given in Table V.

TABLE V. STATE PREDICTION USING 3-STATE HMM: THE PROBABILITY THAT THEMARKOV CHAIN WILL BE IN A GIVEN STATE IN THE SPECIFIED MONTH OF 2017.

| Year 2017 | Jan | Feb | Mar | Apr | May | Jun |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| State $=1$ | 0.2011 | 0.2997 | 0.3513 | 0.3795 | 0.3956 | 0.4051 |
| State $=2$ | 0.5888 | 0.4154 | 0.3362 | 0.2994 | 0.2818 | 0.2732 |
| State $=3$ | 0.2101 | 0.2849 | 0.3125 | 0.3211 | 0.3226 | 0.3217 |


|  | Jul | Aug | Sept | Oct | Nov | Dec |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| State $=1$ | 0.4109 | 0.4150 | 0.4168 | 0.4183 | 0.4192 | 0.4198 |
| State $=2$ | 0.2688 | 0.2664 | 0.2651 | 0.2644 | 0.2639 | 0.2637 |
| State $=3$ | 0.3203 | 0.3191 | 0.3181 | 0.3173 | 0.3169 | 0.3165 |

B. Local Price

Let us consider the maximum of monthly banana prices per 100 kg of our own local market, namely Pala, during the period January 2013 to December 2017. The data is available at http://agmarknet.gov.in and given in Table VI.

TABLE VI. LOCAL BANANA PRICES FROM JANUARY 2013 TO DECEMBER 2017 IN RUPEES/100 KG.

| Year | Jan | Feb | Mar | Apr | May | Jun |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2013 | 4200 | 4200 | 4300 | 4200 | 3600 | 4600 |
| 2014 | 4200 | 3400 | 3000 | 3400 | 3400 | 3400 |
| 2015 | 4400 | 3800 | 3800 | 3200 | 3800 | 3800 |
| 2016 | 3400 | 3600 | 3600 | 5400 | 5400 | 6400 |
| 2017 | 5800 | 5800 | 4800 | 5200 | 4700 | 4700 |
|  | Jul | Aug | Sep | Oct | Nov | Dec |
| 2013 | 5400 | 5800 | 6000 | 5600 | 5400 | 4400 |
| 2014 | 3800 | 6400 | 6800 | 6800 | 5000 | 4600 |
| 2015 | 3800 | 5200 | 5400 | 4400 | 3800 | 3800 |
| 2016 | 6800 | 7400 | 7400 | 4000 | 4400 | 4400 |
| 2017 | 4400 | 6000 | 6800 | 5000 | 5000 | 4500 |

The autocorrelation function (ACF) of the data given in Table 3.2.1 is given in Fig. 2.


Figure 2. ACF of Local price
Here also we fit normal-HMM with two, three and four states and Box-Jenkin's ARMA model. AIC and BIC values of the fitted models are given in Table VII.

TABLE VII. COMPARISON OF FITTED MODELS BY AIC AND BIC.

| Model | $-\log \mathrm{L}$ | AIC | BIC |
| :---: | :---: | :---: | :---: |
| 2-state HMM | 488.8214 | 989.6428 | 1002.1145 |
| 3-state HMM | 474.1935 | 972.3870 | 997.5191 |
| 4-state HMM | 468.1055 | 976.2111 | 1018.0980 |
| ARMA(2,1) | 483.5400 | 977.0900 | 987.5600 |

AIC value selects 3-state HMM whereas BIC selects ARMA model for the data. The transition probability matrix $\Gamma$ for the fitted 3-state normal-HMM is the following:

$$
\boldsymbol{\Gamma}=\left(\begin{array}{lll}
0.7899 & 0.0000 & 0.2101 \\
0.3691 & 0.5148 & 0.1161 \\
0.0000 & 0.1624 & 0.8376
\end{array}\right)
$$

The corresponding estimates of $\boldsymbol{\delta}, \boldsymbol{\mu}$ and $\boldsymbol{\sigma}$ are shown in Table VIII.
TABLE VIII. STATIONARY DISTRIBUTION AND PARAMETERS OF 3-STATE NORMAL-HMM.

| Parameter | State 1 | State 2 | State 3 |
| :---: | :---: | :---: | :---: |
| $\boldsymbol{\delta}$ | 0.3333 | 0.1667 | 0.5000 |
| $\boldsymbol{\mu}$ | 3569.791 | 4318.944 | 5630.15 |
| $\boldsymbol{\sigma}$ | 239.6449 | 132.1290 | 885.4618 |

The mean and standard deviation of 3-state normal-HMM computed using equation (2) are 4724.854 and 1138.419 respectively which are close to the sample mean 4733.333 and sample standard deviation 1135.956 .

Prediction of the most likely sequence of Markov states given the observed data set (decoding) of 3-state normalHMM is done using Viterbi algorithm and is given in Table IX.

TABLE IX. THE MOST LIKELY SEQUENCE OF HIDDEN STATES OF 3-STATE NORMAL-HMM.

|  | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2013 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |
| 2014 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 |
| 2015 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 2 | 1 | 1 |
| 2016 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 |
| 2017 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

The state predictions of banana prices in the months of the year 2018 based on 3-state normal-HMM is given in Table X.

## TABLE X. STATE PREDICTION USING 3-STATE HMM: THE PROBABILITY THAT THE MARKOV CHAIN WILL BE IN A GIVEN STATE IN THE SPECIFIED MONTH OF 2018.

| Year 2018 | Jan | Feb | Mar | Apr | May | Jun |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| State $=1$ | 0.1847 | 0.2646 | 0.3003 | 0.3168 | 0.3247 | 0.3287 |
| State $=2$ | 0.2690 | 0.2076 | 0.1830 | 0.1732 | 0.1693 | 0.1677 |
| State $=3$ | 0.5463 | 0.5278 | 0.5167 | 0.5100 | 0.5060 | 0.5036 |
|  | Jul | Aug | Sept | Oct | Nov | Dec |
| State $=1$ | 0.3308 | 0.3319 | 0.3325 | 0.3328 | 0.3330 | 0.3332 |
| State $=2$ | 0.1671 | 0.1668 | 0.1667 | 0.1667 | 0.1667 | 0.1667 |
| State $=3$ | 0.5021 | 0.5013 | 0.5008 | 0.5005 | 0.5003 | 0.5001 |

## CONCLUSION

For the global banana price data, the best fitted model is found to be the 3-state normal-HMM having stationary distribution $\boldsymbol{\delta}=\left(\begin{array}{ll}0.4119 & 0.2946 \\ 0.2935\end{array}\right)$, state dependent mean vector $\boldsymbol{\mu}=\left(\begin{array}{ll}927.6933 & 956.1636 \\ 1020.9425\end{array}\right)$ and $\boldsymbol{\sigma}=$ (12.15587.8888 39.2086). On studying the Viterbi path of states of 3-state HMM in relation with the prices, it is found that state 1 corresponds to less than 940 USD, state 2 corresponds to price between 940 USD and 970 USD and state 3 corresponds to more than 970 USD. From Table V it can be seen that the probability that the Markov chain will be in state 2 is high for the months January and February and the probability is high for state 1 for the rest of the months.

The best fitted model for the local banana price is found to be the 3-state normal-HMM having stationary distribution $\boldsymbol{\delta}=(0.33330 .16670 .5000)$, state dependent mean vector $\boldsymbol{\mu}=(3569.79104318 .94405630 .15)$ and $\boldsymbol{\sigma}=$
(239.6449 132.1290 885.4618). On studying the Viterbi path of states of 3-state HMM in relation with the local market prices, it is found that state 1 corresponds to less than 4000 rupees, state 2 corresponds to price between 4000 rupees and 4400 rupees and state 3 corresponds to more than 4400 rupees.
The present study reveals that HMMs can be effectively used to model and study the hidden factors (states) which affect the prices of agricultural commodities.

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