

**The Scientific Publics in Keralam:
A Study of Kerala Shastra Sahitya
Parishad During the COVID-19
Pandemic**

Sangeeth S Varma

M2020DS070



A dissertation submitted in partial fulfillment for the
degree of

Master of Arts

in

Development Studies

School of Development Studies

2023

CERTIFICATE

This is to certify that the dissertation entitled “**The Scientific Publics in Keralam: A Study of Kerala Shastra Sahitya Parishad During the COVID-19 Pandemic**” is the record of the original work by **Mr Sangeeth Saji Varma** under my guidance and supervision. The research results presented in this dissertation/ thesis have not previously formed the basis for the award of any degree, diploma or certificate of this Institute or any other institute or university.

31/03/2023



Dr Suresh Madhavan

Chairperson, Centre for Social Theory,

School of Development Studies,

Tata Institute of Social Sciences, Mumbai

Declaration of Authorship

I, Sangeeth S. Varma, hereby declare that this dissertation titled, 'The Scientific Publics in Keralam: A Study of Kerala Shastra Sahitya Parishad During the COVID-19 Pandemic', is the outcome of my own study undertaken under the guidance of Dr. Suresh Madhavan from the School of Development Studies, Tata Institute of Social Sciences, Mumbai. It has not previously formed the basis for the award of any degree, diploma, or certificate of this institute or any other institute or university. I have duly acknowledged all the sources used by me in the preparation of this dissertation.

Signed:

Date:

Abstract

The Kerala Shastra Sahitya Parishad is an organisation and associated movement that acts as a forum for the scientific publics in Keralam, to articulate a vision of social progress based on science. Along with previously existing challenges such as those of exclusions and oppositions, the present poses a set of new challenges in the form of crises, especially those related to knowledge, in the broader world and to the long-standing work of the Parishad. The COVID-19 pandemic and the YouTube channel of the Parishad provide us with sites to examine the present condition and activities of the Parishad.

Acknowledgements

This study has been possible because of the support and contributions of several persons. First of and foremost, I wish to convey my sincere thanks to my supervisor, Dr. Suresh Madhavan, School Development Studies, Tata Institute of Social Sciences. I would also like to thank all the faculty and staff of the School of Development Studies, Tata Institute of Social Sciences.

I would like to thank my family for their love and support during my extended pursuit of education.

I would also like to thank my friends, particularly Shivam, Nisha, Shashwat, Amol, Sheshansh, and Ujjwal, for their support during the writing of this dissertation and beyond.

Contents

Certificate	
Declaration of Authorship	ii
Abstract	iii
Acknowledgements	iv
List of Figures	vii
Abbreviations	viii
1 Introduction	1
1.1 Situating Keralam	3
1.2 The legacy of the "Kerala Renaissance"	5
1.3 The "Kerala Model" of Development and its Critiques	6
1.3.1 The term "Kerala Model"	7
1.3.2 Exclusion and Triumphalism	8
1.3.3 Fiscal Unsustainability and Integration into Global Capitalism	10
1.3.4 Unemployment	10
1.3.5 Ecological Unsustainability	11
1.3.6 Conclusion	11
1.4 Keralam and COVID-19	11
1.4.1 A Timeline of the first 37 weeks of COVID-19 in Keralam: .	12
1.4.2 Keralam's COVID Response	13
1.4.3 Keralam, COVID-19 and Civic Epistemology	14
1.5 Scientific Publics and Scientific Public Spheres	15
1.5.1 Public Understanding of Science and Civic Epistemology . .	19
1.6 Science and Society	20
1.7 Science at Present: Crises, Risk Society and Post-Normal Science .	24
2 The Kerala Shastra Sahitya Parishad	26
2.1 People's Science Movements	28

2.2	The Origins of the KSSP	30
2.3	KSSP's Approach to Science	31
2.4	Shastra Kala Jatha	33
2.5	KSSP and the Scientific Public Spheres	34
2.6	KSSP and Development: From the 1970s to the 1990s	35
2.7	Activities of KSSP during COVID-19	38
3	Science Kerala by KSSP	40
3.1	A Note on Methodology, and Some Preliminary Analysis	43
3.2	Activities for Children	45
3.2.1	Vijnanotsavam	45
3.2.2	100 Days of Science Experiments	46
3.2.3	Other	46
3.3	Marivillu: Science Conversation Evenings	47
3.4	COVID-19	49
3.5	Kerala Padayatra	50
3.6	Thematic Analysis	52
3.7	Scientific Temper	53
3.8	Conclusion	54
4	Conclusion	56
4.1	Challenges	58

Appendix A

Bibliography

64

Turnitin Originality Report

List of Figures

3.1	Number of views on videos over time	43
3.2	A view of a stage of the Kerala Padayatra in progress	50

Abbreviations

KSSP	KeralaShastra Sahitya Parishad
COVID-19	Corona Virus Disease 2019
CDS	Centre for Development Studies
UN	United Nations

Chapter 1

Introduction

We live in a society beset with crises. How we understand and respond to the present crises as a democratic society is based on our shared ways of understanding and responding, which are in turn based on the systems of knowledge and the social relations that exist between us. The systems of knowledge and social relations that exist in the regional setting of Keralam are the particular concern of this dissertation.

The COVID-19 pandemic has been an illustrative experience on a variety of topics, including how science and society deal with a localised, yet global challenge. It has been an opportunity for the scientific publics to go behind the scenes on scientific knowledge production and deal with the epistemic uncertainties underlying a modern scientific endeavour. The state and techno-science alliance that underlies public policy-making also faced a challenge in adapting the unfolding knowledge production into governmental action, with the explicitly stated goals of maintaining a "healthy economy" and public order, even over the health of people and society.

In Keralam, the pandemic was seen as a victory for the 'Kerala Model', when the first wave of infections during the first few months of 2020 - of which it was one of the first sites of outbreak - was dealt with in a manner that was celebrated in comparison to the rest of the country, and even as an exemplar at the global

level. The government leveraged the experience of a recent Nipah virus outbreak, the presence of a robust public health system, the cooperation of myriad civil society organisations, the police force, as well as to a certain extent the feeling of exceptionalism that the society in Kerala has in relation to the rest of the country, in order to create a strategy of containing the infection. (Chathukulam & Tharamangalam, 2021)

However, surges in both infection and mortality occurred in the following months, particularly following the return of large sections of the diaspora following the wider spread of the pandemic across the globe and in India and the subsequent lockdowns and socioeconomic crises. While the management of the crisis that followed could still be favourably compared to other instances, the need for a critical reexamination of governmental as well as other social institutions remains.

The Kerala Shastra Sahitya Parishad (KSSP) is arguably the most prominent civil society organisation in the scientific public sphere of Keralam, even if its prominence has declined over the years since its heyday of being a determinant part of the discourse, during the latter half of the 20th century. Nevertheless, it still has an influential position due to its linkages to the technocrats of the state, its widespread network of ground-level activists, and its publications.

The KSSP, like many other organisations and institutions, substantially increased its internet presence during the lockdown instituted during the pandemic. This includes the creation of WhatsApp channels, Telegram channels, activation of the YouTube channel, and so on. Due to the limits placed on in-person interactions and gatherings during lockdowns, many of the KSSP's activities had to be halted. In their lieu, the members of the KSSP, like many others, took up webinars and other online methods of maintaining its public presence. In this dissertation, we will examine some of the YouTube videos on the "Science Kerala by KSSP" channel - the official channel of the KSSP, which was a major part of this online presence.

In this introduction, we will examine the idea of Keralam as a region; the social relations of knowledge production and determination, through the ideas of scientific public spheres and civic epistemologies; the ideas of crisis and risk society

as a possible frame to examine the conditions under which we live and think of the world in our times; and the idea of public understandings of science and its relations to these ideas.

In the next chapter, we will elaborate upon the KSSP and critically examine its role in the Kerala public sphere. We will examine the activities of the KSSP, and how they have changed and is changing. Then, in the following chapter we will analyse the YouTube channel of the KSSP and some of the videos - which include interviews, presentations, webinars, panel discussions, speeches, and so on. We will try to situate them within the scientific worldviews they are expressing, and examine the diversity or lack thereof among them, to understand the role of the KSSP in the scientific publics of Keralam. Then we conclude our discussion by presenting some of the challenges that currently face a democratic people's science movement such as the KSSP.

1.1 Situating Keralam

Keralam¹, a southern state of India, which has been perceived to have many extraordinary anthropological, demographic, ecological, economic, educational, historical, political, religious, etc. features (Hill, 1986), is the area of interest in this study.

In the editorial introduction of the volume "Kerala Modernity: Ideas, Spaces and Practices in Transition", Varughese and Bose propose three methodological coordinates to highlight a shift in our understanding of Keralam as a region and its engagement with modernity.

The first emphasises that region is not just a subnational entity completely subsumed by a nation, but an active, multiple entity which constantly de/re-territorializes

¹I am attempting to use Keralam instead of Kerala, when used as a noun, in the context of a trend that I have perceived of doing so among Kerala scholars and the language movement, in a perhaps overstated attempt at decolonisation.(Arya U.R., 2019; The Hindu, 2019) It might not be consistent throughout the work due to the ingrained habit of using Kerala. I perceive the difference in usage as a minor, but useful reminder of the linguistic context.

itself, i.e., it is constantly unmaking and remaking the conceptions of the territory upon which the imagination of the region operates. Therefore, the region is not a passive entity but an active one which shapes its own being and becoming.

The second coordinate affirms that the region is in the process of constant reconfiguration through the actions and practices of its diverse inhabitants, and not an inert substrate. The region is therefore a dynamic entity, constantly evolving and changing over time.

The first two coordinates are perhaps of particular relevance for a region like Keralam, which in many ways defines its identity in the form of exceptionalism within the national context, a theme that is reflected in many of the speeches and presentations in our analysis.

In the third coordinate, they highlight the deep, heterogeneous and highly dynamic connections that regions have with global modernity i.e. that regions are not isolated entities but are rather deeply interconnected with the wider world.

Through the frame of these coordinates, a picture of the region as a complex, multi-faceted, dynamic and globalised entity constantly under reconfiguration through the lives of its inhabitants - who are themselves subjects of globalised, reflexive modernity anchored in the region's history and society. Expanding the conception of the region in this way, away from a heretofore more common basis of language or community, we can have a richer engagement with its nature as part of complex systems.

However, in acknowledging the complex, situated and connected nature of the region, we may lose out on an element of the parochial that is perhaps as present in the society of Kerala as the elements of cosmopolitanism, perhaps even producing a kind of parochial cosmopolitanism, i.e. a cosmopolitanism that is engaged with primarily through a lens attached to the region.² It is interesting to examine the effects of this interplay of parochial and cosmopolitan sensibilities, especially as it

²This is likely a feature that Keralam shares with other parts of the world exposed to networks of trade, many histories of movements of peoples, and an integration into the globalised world.

moves into a digital sphere. A good example of this is the discourse around the "Kerala Model".

1.2 The legacy of the "Kerala Renaissance"

The term 'Kerala Navotthaanam' (Kerala Renaissance) is a dominant concept in the public discourse of Kerala.³ It signifies the profound movements for cultural, social, and political change that emerged in Kerala in the late 19th and early 20th centuries. The period was marked by movements which sought to modernize Kerala society and challenge the conservative and feudalistic practices that dominated the region. The most significant of these were the emergence of anti-caste movements and assertion movements by the oppressed castes, community reform movements among different caste and religious communities, and anti-feudal and workers movements. These became interlinked with and fed into the emergent popular nationalist movement and the nascent Communist movement. The Kerala Renaissance had a profound impact on Kerala's social, cultural, and political landscape.

One of the central goals of the movements was to promote education and literacy, which was restricted to the elite. The famous agricultural strikes called by Mahatma Ayyankali with the demand that the children of the Dalit caste were allowed to attend schools, are an instance of this. The movements were thus led by reformers who believed that education was the key to progress and social transformation. This emphasis on education was critical in breaking down caste barriers and promoting social mobility, as people from traditionally marginalized communities, including a great number of women, were able to acquire the skills and knowledge needed to improve their economic and social status, and enter the emergent national and regional public spheres.

³The term Renaissance as used here has been criticised by scholars such as J. Devika, since it gives a sense of recovering old traditions and progress due to this process. The borrowing of this term from the Italian or European context does not make literal sense in the context of Kerala. J. Devika, instead suggests something a like a "Van Kadayal" (Great Churning). See, for instance Brahmana Vyavashakkullile Sthree.

However, there have been many critiques made of the characterisation of the time period in the public discourse. It is often depicted as a moment of triumph, which denotes a clean break from a past rooted in injustice to a modern, more just society. This ties into the ideas of triumphalism and exceptionalism that we will examine further.

There is also the attempt by various movements to claim or appropriate the mantles of the leaders and movements of the period. The Communist Parties in Kerala have been particularly accused of claiming to be the upholders of the values of the Renaissance, while betraying the transformative anti-caste nature of the movements they claim, for their own political vision.

The movements and organisations that arose during the period, as well as the many personalities of the time, have left behind a legacy which is often seen as resulting in the "Kerala Model".

1.3 The "Kerala Model" of Development and its Critiques

The Kerala Model of Development is a term used to describe the development path taken by the state of Kerala. It is widely regarded as a unique success story of development, with the state achieving high levels of human development and social welfare indicators, despite having a relatively low level of economic development. The model has been praised for its emphasis on social and economic equity, and its focus on public investment in education, healthcare, and social welfare. It has also been cited as an early prototype of a vision of sustainable development due to the achievements in improving people's quality of life, relative environmental stability, high levels of social and economic equality, and a decline in political strife - particularly in communalism(Parayil, 1996).

The state governments have played a key role in implementing these policies, with a high level of investment in public services and infrastructure, supported

by a strong civil society, including the Kerala Shastra Sahitya Parishad (KSSP). In addition to its emphasis on social welfare policies, the Kerala Model of Development has also been characterized by a strong commitment to democratic governance and participation. The state has a long tradition of popular movements and mobilization, with relatively active participation by women, Dalits, and other marginalized groups. The state government has also often supported these movements, with policies aimed at empowering marginalized communities and promoting social inclusion.

The state has invested heavily in healthcare and education, with high levels of enrollment and achievement among women and marginalized communities, compared to most other Indian states. This has resulted in significant improvements in indicators such as infant and maternal mortality, life expectancy, and literacy rates, as well as reduced poverty and inequality.

In general, the critiques of development that have been raised in other parts of the world (Escobar, 1992) have often also been raised in Kerala, including by the KSSP. And thus, while the achievements of the state and society in Kerala cannot be denied, the ideas of development the 'model' represents, the distribution of the gains and effects of the model, and the idea of it as a 'model' requires close examination, and there have been several substantive critiques of it.

1.3.1 The term "Kerala Model"

The term itself is contentious. It gained the attention of scholars and the wider world by a 1975 study for the United Nations led by K.N. Raj and team from the Centre for Development Studies (CDS), Thiruvananthapuram.⁴ (Oommen, 2018) Oomen (Oommen, 2018) also points out Amartya Sen (In association with Jean

⁴The study was published in 1975 as "Poverty, Unemployment and Development Policy: A Case Study of Selected Issues with Reference to Kerala". However, the origins of this study can be traced to a paper Raj co-authored to help the Kerala Government prepare its Fifth Five Year Plan. (Thomas, 2020)

Dreze. As in, for example, (Drèze & Sen, 2013)⁵ and Robin Jeffrey (Jeffrey, 1992) as sources of the spread of the usage.

Another critique of the term is that it implies a homogeneity and coherence to Kerala's development path that does not exist in reality. Kerala's development has been marked by a variety of contradictions, tensions, and challenges, including persistent inequalities especially in terms of caste and gender disparities, and environmental degradation. These issues are often overlooked or downplayed in discussions of the Kerala Model, which can lead to a simplistic and one-dimensional view of Kerala's development path.

In his introduction to "Development, democracy and the state: critiquing the Kerala model of development", Ravi Raman also points out the possibility of an element of orientalism in the way the discourse of the Kerala Model has been taken up amongst wider audiences. (Raman, 2010a)

It can also be argued that the term is a misnomer as it implies that there is a single model or blueprint for development that can be applied universally, when in fact Kerala's development has been unique and context-specific. While Kerala's development path has been characterized by a number of distinctive features, including high levels of social welfare spending, emphasis on public education and healthcare, and strong government intervention in the economy that can be emulated elsewhere, the emergence of these features in tandem have been shaped by a complex set of historical, political, and social factors, and cannot be easily replicated in other contexts.

1.3.2 Exclusion and Triumphalism

Development in Kerala has not been immune to the persistence of, or inheritance of, past systems of inequalities and their perpetuation. Due to the exceptionalism

⁵However, he also points out that they even warn that the rhetoric of a 'Kerala model' is "convenient for debunking purposes than for identifying what there is to learn from Kerala's experience." They have also pointed out the frequent misattribution of the term to them and pointed out the fallacy of the idea a mechanical emulation of a 'model'. (Drèze & Sen, 2013)

exhibited in comparison of the state to the rest of India and the reality of substantive gains in addressing social inequality, these persistences and perpetuations have often been overlooked.

While the state has indeed made significant progress in promoting social welfare and inclusion, it has not been able to fundamentally transform the underlying structures of power and privilege that perpetuate inequality and discrimination. This has limited the state's ability to promote social justice and empowerment, and has left marginalized communities vulnerable to exploitation and oppression. The gains of development, and even those of redistributive policies, have been distributed highly unequally in terms of caste, gender, religion, ethnicity, region and class. (Raman (Raman, 2010b))

The dominant left in Kerala has often claimed sole credit for the achievements of redistribution and development, leading to its glorification as a model for social democracy. Uncritical adoration of the 'model' has often played a part in further marginalizing the disadvantaged and oppressed groups of people in Keralam, restricting the scope of public critical discourse.(Devika, 2010)

This phenomenon of critical discourse in the public sphere being countered by a sense of left triumphalism is often encountered, particularly in the online and anonymised public spaces, as a contempt towards even nominally dissenting voices, and by vicious attacks by social media troll armies. This has resulted in what could be called "the increasing lumpenisation of the dominant left social media commentators who violently attack and silence dissent of any degree - making dialogue and collective deliberation as well as any critical examination of or demand for data almost impossible." (Devika, 2023)

Thus, the idea of the "Kerala Model", as well as a contentious political culture, often lead to denial of the problems of exclusion and continuing systemic violences and power differences. The 'Model', often presented as a uniquely successful model of development benefiting all the diverse social sections of society in Keralam, ignores the continuing existence of class and caste differentials in the state, and the unequal power relations that have been reproduced over time. The official

discourse in the academy, in policy and in the wider public consciousness, hides the reality of various social sections and often prevents any possibility of a counter-discourse.(Devika, 2023) This reinforces the power of the dominant discourse and often uncritically perpetuates a recycled paradigm of progress and development for all first highlighted by the United Nations study in the mid-1970s.(Ravi Raman, 2010)

1.3.3 Fiscal Unsustainability and Integration into Global Capitalism

One of the key challenges of Kerala has been its dependence on external resources and support(Raman, 2010a), including a critique from the more radical left for its integration into the wider exploitative systems of modern globalised capitalism.(Mohan, 1991; Ravi Raman, 2010)

The state has been heavily dependent on remittances from migrant workers(Kannan, 2023; Rajan & Zachariah, 2020), as well as on support from the central government and international aid agencies(Raman, 2009). This has limited the state's ability to implement its own policies and agendas, and has left it vulnerable to external pressures and influences.

This also includes a marked decline in the production capacities in the state, especially in terms of agricultural and other basic consumption.(Kannan, 2023)

1.3.4 Unemployment

Unemployment among the younger generation is high and increasing, especially among educated women. Such a high rate of underutilisation of labour despite high human development and high economic growth along with an advanced stage in demographic transition could be considered a spectacular failure.(Kannan, 2023)

1.3.5 Ecological Unsustainability

The floods⁶ of 2018 and 2019 along with the rising global dialogues have intensified the public consciousness of ecological dangers. The role of the degradation of the Western Ghats through unrestricted development in exacerbating the impact of the heavy rainfall was widely discussed (Padma, 2018), along with a renewed discussion about the Kasturirangan and Gadgil Reports on the Ghats. (D'Souza, 2020).

1.3.6 Conclusion

Thus, instead of relying on the idea of a single model or blueprint for development, we could argue that each country or region develops its own unique and dynamic path to development, based on its own historical, social, and political context. While the importance of taking into account local needs, resources, and capacities, and of building inclusive and participatory systems of governance that empower people to shape their own development path in the idea of the "Kerala Model" is relevant to emancipatory political movements, the term often obscures the complexities in the reality of Keralam and stands in the way of critical progress, both in and outside the region.

1.4 Keralam and COVID-19

Keralam's response to the COVID-19 pandemic has been praised as a model for effective crisis management (Elias, 2021) and the state garnered significant praise for its management of the pandemic. The state's approach has been characterized by a focus on community engagement and collaboration, a commitment to transparency and accuracy, and a reliance on scientific evidence and epidemiological data. However, there were also concerns about the sustainability of the government's approach, given the economic and political pressures that the state faced.

⁶Which may more accurately be described as a series of disasters - including landslides and flooding - induced by unexpected extreme rainfall

In terms of statistics as well, Kerala maintained a low death rate despite very high numbers of cases in later stages.⁷

1.4.1 A Timeline of the first 37 weeks of COVID-19 in Keralam:

This provides a brief overview of the background conditions in the public sphere in Keralam, during the first 9 months of the pandemic, and provides some context for our analysis.⁸

The first COVID-19 case in India was reported in Keralam on January 30, 2020, in a medical student who had returned from Wuhan, China. Three cases reached the state in the next two days, and were contained due to the high alert in place.

Until March 9, no new cases were reported, when Phase Two began with cases detected among Italian returnees in Pathanamthitta who had reached the state on February 28. This was a very crucial phase for the state as panic started over how the cases and route map were detected.

When travel was restarted from other states and countries, Keralites from abroad returned in very large numbers. There was a concurrent rise in the number of cases, which was predicted, but until May 31, no community spread identified.

On June 8, the lockdown was removed and confined to containment zones.

Between July 6 and August 16, political allegations from the opposition parties, and protests by their workers gained much more space in the public sphere than the pandemic, after the topic gold smuggling through diplomatic channels at Thiruvananthapuram airport came to light on July 6. A 'triple lockdown' was declared for a week in the Thiruvananthapuram Corporation on the same day, because several cases were detected with unknown specific origin points of infection. However,

⁷Here, it has been suggested the relatively very high numbers of cases in Kerala could be due to perverse incentives in other regions. ("Higher Cases, Low CFR", 2021; John, n.d.)

⁸From (Viswanath, 2020)

allegations of the government using lockdown to stifle protests arose, as well as allegation by the government that the protests were creating more cases.

The Malayalam month of Chingam (approximately between August 17 - September 5 in 2020) is the season of the Onam festival as well as a time when a large number of weddings occur. The government fixed the number of people who could attend weddings and other gatherings. However, people did not strictly follow this, for example, arranging functions where people attended in shifts. This meant the actual numbers of interactions were very high.

Between September 6 and 26, the number of cases doubled. 1,00,000 cases and 371 deaths were reported during these 21 days.

Between September 27 and October 10, Kerala was in the top three states in new COVID-19 cases (in terms of per million population, per week), when 158 cases were registered in the week of September 19 to 26. 1,000 daily new cases were reported twice during this period.

1.4.2 Kerala's COVID Response

Chathukulam and Tharamangalam (Chathukulam & Tharamangalam, 2021), evaluates the initial success, subsequent reversal and the factors underlying both. They examine the legacy of the "Kerala Model" in the form of "robust and decentralized institutions and provisions for healthcare, welfare and safety nets, and especially the capacity of a democratic state working in synergy with civil society and enjoying a high degree of consensus and public trust." They then examine the surge of the virus in the third wave and attempt to establish whether this was due to mistakes of the state or deficits in its model of "public action", including the adversarial politics of the state, which has a disruptive tenor about it.

They also detail some of the failures of the state in the handling of the crisis, including police violence (especially in the context of coastal fishing communities in Thiruvananthapuram) and the controversy over data management.

However, since the article was published in September 2020, it does not deal with the subsequent timeline, or the issues that were raised since then, such as the inadequacies of the digital education program of the government. (“Opposition Corners Kerala Government on KSSP Report”, 2021; The Hindu, 2020b)

More broadly, their framework follows the triumphant ”Kerala Model” narrative. The four factors they identify as the basis of the legacy of the model are a proactive and interventionist state, social mobilization and public participation, state-society synergy and the results of social reform in the ”Kerala Renaissance”. This assessment is broadly in line with the existing public political consensus of the broadly left-wing and liberal public of Kerala.

1.4.3 Keralam, COVID-19 and Civic Epistemology

Knowledge generation and distribution played a crucial role in Keralam’s response to the pandemic. The government’s stated reliance on scientific evidence and epidemiological data, along with the wider acceptance of pandemic conditions helped build relatively high levels of trust in public institutions and ensure a coherent response to the pandemic. However, there were concerns about the government’s handling of information, and reports of censorship and suppression of information that arose, particularly in later stages of the crisis. Furthermore, while the government’s communication strategy was generally effective, there were also challenges in managing misinformation and rumors on social media platforms. There was also political outcry over privacy related to the outsourcing of the data management.(Jacob, n.d.)

Participation and collaboration were also important features of Keralam’s response to COVID-19. The involvement of local governments, community organizations, and volunteers helped to foster a culture of civic engagement and collaboration. However, aspects of the government’s centralization of decision-making may have limited the participation of civil society actors, and there were concerns about the sustainability of the community-led approach.

Keralam's response to COVID-19 is also observed to have reflected a commitment to social justice and equity, with a focus on vulnerable populations and a commitment to transparency, accuracy, and accessibility.(Rahim et al., 2020)

While recognizing the merits of these arguments, we also need to examine the logics of the state-technoscience duo that underpin the COVID-19 response. This will be done in the next chapter in the context of the KSSP.

1.5 Scientific Publics and Scientific Public Spheres

The concept of scientific public spheres refers to the discursive spaces in which scientific knowledge is generated, communicated, and debated amongst diverse publics. The scientific public sphere emerges from the broader conception of the public sphere, a discursive domain defined by Habermas as an arena of rational-critical debate that enables individuals to articulate and contest their interests, values, and beliefs in a deliberative and democratic manner such that "something approaching public opinion can be formed".(Habermas et al., 1974)

In a scientific public sphere, scientific experts and non-experts engage in dialogue about scientific discoveries, theories, and controversies, producing and exchanging knowledge through a range of communication media and practices, including academic journals, conferences, public lectures, online forums, and social media. In a broadly diffusionist or deficit model, the scientific public sphere facilitates the diffusion of scientific knowledge and enables the public to access, understand, and evaluate scientific findings and claims, fostering public literacy and engagement with science.(Varughese, 2017c) The contextualist or constructivist framework, however situates laypeople as heterogeneous 'publics' with social and political agency, unlike the earlier 'deficit model' that saw the public as a passive homogeneous category.(Varughese, 2012)

The scientific public spheres also provides a site of contestation and negotiation between scientific experts and non-experts, as it enables the public to question,

challenge, and contest scientific claims, methods, and values. Such contestation can help to democratize science and to enhance the social accountability of science, by subjecting scientific knowledge and practices to public scrutiny and evaluation. (Varughese, 2017d)

The concept of scientific public spheres highlights the importance of creating inclusive and deliberative spaces for generating, communicating, and contesting scientific knowledge in contemporary societies of risk and post-normal science. By enabling scientific experts and non-experts to participate in a mutually enriching and challenging dialogue about science and its societal implications, the scientific public sphere contributes to the democratization and social relevance of science, as well as to informed and evidence-based decision-making in policy and governance. (Varughese, 2017b)

Scientific publics are therefore, the participants in the scientific public spheres. The concept of scientific publics refers to the diverse groups of people who engage with scientific knowledge, practices, and institutions in various ways, either as "producers" or "consumers" of scientific knowledge. The notion of scientific publics emphasizes the diversity of social actors involved in the production and consumption of scientific knowledge.

One way of categorizing scientific publics is by their level of scientific literacy and engagement with scientific institutions. For instance, there are lay publics, who have limited or no formal scientific training, but are interested in scientific topics and rely on various sources of information to form their opinions and beliefs about science. Lay publics can include individuals from different social and cultural backgrounds, as well as advocacy groups, NGOs, and other civil society actors who aim to promote scientific literacy and public engagement with science. In our engagement with the KSSP, we will see that these distinctions are often the most significant aspect in a diffusionist or positivist model of science, that is still predominant.

Sheila Jasanoff, a science and technology studies scholar, has developed several ways of categorizing scientific publics based on their relationship to science and

technology.(S. Jasanoff, 1998, 2004; S. S. Jasanoff, 1987) Along with her categories, we can identify some others as well.

1. **Constituency publics:** These are publics who are directly affected by scientific and technological developments, such as patients, consumers, and workers in scientific and technological fields. Constituency publics have a direct stake in the outcomes of scientific research and are often organized around specific issues or concerns.
2. **Expert publics:** These are publics who have specialized knowledge or expertise in scientific or technological fields, who have formal scientific training, including scientists, engineers, technologists, and other technical professionals who work in various domains of scientific inquiry and innovation. Expert publics are often consulted by policymakers and other decision-makers to provide advice and expertise on technical matters.
3. **Issue publics:** These are publics who are concerned with specific issues or controversies related to science and technology, such as genetically modified organisms, climate change, or stem cell research. Issue publics may be composed of diverse stakeholders and may engage in public debate and advocacy to influence policy decisions.

Another way of categorizing scientific publics is by their specific interests, values, and goals related to scientific knowledge and practices. This relates to the issue publics, but can be seen as distinct from them.

For example, there are publics who are concerned with environmental issues and the impact of scientific and technological innovation on the natural world, such as environmental activists, conservationists, and green consumers. There are also publics who are interested in the ethical and social dimensions of science, such as bioethicists, social scientists, and policy makers who seek to address the ethical, legal, and social implications of scientific research and innovation.

The issue publics are also related, but distinct, to a possible category of adversarial publics, i.e. individuals who identify themselves as being skeptical or critical of science and scientific knowledge in its entirety or in parts, but usually in a distinct way from a critical theory perspective, such as anti-vaccination activists, climate change deniers, and creationists. The distinction may lie in a difference of broader political alignment.

4. Mass publics: These are publics who are generally interested in science and technology but do not have specialized knowledge or expertise in scientific or technical fields. Mass publics consume information about science and technology through the media and other popular sources and may form opinions and attitudes based on this information.
5. Connecting publics: Finally, there are also publics who are engaged in the production and dissemination of scientific knowledge and practices, such as citizen scientists, science communicators, and science journalists who seek to democratize scientific knowledge and make it more accessible and relevant to diverse publics.

Jasanoff's categorizations highlight the diversity of scientific publics and the different roles that they play in shaping the governance and regulation of science and technology. It is obvious, but necessary, to acknowledge the porous and overlapping nature of these categories, as well as the non-uniformity within them, especially as we step even further into specialisation in knowledge production.

In addition to these, Varughese (Varughese, 2012) further posits the categories of quasi-publics and non-publics in contrast to the category of the scientific-citizen public, to highlight the exclusions present in the creation and maintenance of the technoscientific public spheres and the role of the state in the process. He identifies scientific-citizen publics as constituted by civil society, quasi-publics as those that initiate a different, more nebulous kind of engagement through the activation of 'political society,' and non-publics as those excluded from these spheres of engagement.

Further, he posits that "the scientific-citizen publics are mobilized *in contrast to* the quasi-publics and *with reference to* the non-publics". (Varughese, 2012) This idea gives us a model to think about the complexity of how the 'state-technoscience duo', which is the dominant force of knowledge management as well as social control in the present, engages with the publics. We will return to this in our analysis of the KSSP.

1.5.1 Public Understanding of Science and Civic Epistemology

Civic epistemology is a theoretical framework that explores the intricate interrelationships among knowledge, democracy, and citizenship. It posits that knowledge is not a neutral and objective entity, but is contingent upon the social, political, and cultural contexts in which it is situated, and thus subject to interpretation, negotiation, and contestation. (Miller, 2008)

Civic epistemology centers on fundamental questions such as: what constitutes knowledge, who holds the power to decide, how are knowledge claims validated, how do different forms of knowledge intersect and interact, and how are knowledge systems evaluated and prioritized?

This framework prioritizes public engagement and participation in knowledge production, dissemination, and use, acknowledging that knowledge is generated not only by experts in specialized domains but also by everyday experiences, cultural traditions, and social practices. In this regard, civic epistemology promotes a more democratic and inclusive approach to knowledge production and use, valuing multiple voices and perspectives. It is thus an expansion of previous frameworks of public understanding of science.

Some core principles of civic epistemology include epistemic justice, epistemic humility and epistemic responsibility.

Epistemic justice recognizes that knowledge should be produced and used in ways that are equitable and inclusive, acknowledging the exclusion of marginalized communities from the production and use of knowledge, and aims to address these inequalities.

Epistemic humility the recognition that knowledge is always subject to revision, and the importance of openness to new ideas and willingness to reconsider one's own beliefs and assumptions.

Finally, epistemic responsibility is a principle that underscores the importance of ensuring that knowledge is used for the public good and that its potential risks and benefits are carefully considered, highlighting the need for accountability and transparency in knowledge production and use.

The civic epistemology framework is a philosophical tool that recognises the social nature of knowledge, thus helping us frame our questions and debates on philosophy and politics in a more ontologically accurate.

1.6 Science and Society

Perhaps one of the most significant changes that occurred during the 20th century was a shift in the way science was conducted. In earlier periods of the century, scientific research was often carried out in isolation, with individual scientists pursuing their own lines of inquiry, albeit with collaborations and interaction with the broader scientific community - the image of the gentleman scientist. However, as the century progressed and the World Wars occurred, there was a growing recognition by the state of the power of science, and the creation of "Big Science". (Price, 1963)

"Big Science" refers to the large-scale scientific research projects that primarily emerged during and after World War II, often as a consequences of the mobilization of scientists for the war machine. These projects were characterized by their massive budgets, large teams of researchers, and ambitious goals. In the context

of the Cold War, both the United States and the Soviet Union engaged in a race to develop new technologies and weapons, leading to a massive increase in government funding for scientific research, as the state sought to harness the power of science for military purposes. This government funding, in turn, led to the growth of large research institutions and the emergence of Big Science.

One of the examples most used as an illustrative example of the advent of Big Science is the Manhattan Project, which developed the first nuclear bombs. This project brought together a massive team of scientists and engineers, who worked together to achieve a single goal. The success of the Manhattan Project demonstrated the potential of Big Science to produce significant technological breakthroughs, and its usefulness to the state. The state provided the funding and support necessary for Big Science to flourish, and consequently, the state also exerted control over the direction of scientific research, using Big Science to advance its own military and political interests.

While Big Science was primarily funded by the state, due to the nature of the American military-industrial complex that emerged, it also often relied on private industry to provide the necessary infrastructure and technology. This led to close ties between Big Science and the private sector, as both worked together to develop new technologies and products, accelerating the growth of the linkage between capital, state and science. (Becker, 2018) This new model of science was normalised throughout the world in the capitalist side of the Cold War. The purely state-led research model was in competition with this model, and ultimately lost out, with the fall of the Soviet Union.

The growth in funding was also required by the increasing complexity and resource intensive nature of the experimental research being conducted. (Price, 1963) This increasing complexity and diversity, as well as the requirements of producing the outputs demanded by state and capital, led to the emergence of new trends in how science is done, such as the increased hyper-specialisation and the decrease in interest in less practical, perhaps more fundamental aspects of science. This latter change is highlighted by the phrase "Shut up and calculate", which is used in the

context of quantum mechanics to instruct physicists to dismiss questions of the underlying nature of reality and what quantum mechanics means, since the important thing is that it works and produces technologically useful results.(Becker, 2018) Therefore, it prioritizes technological innovation over basic scientific research.

Thus, this focus on applied research has led to a decline in the funding for more traditional forms of scientific research, which may have long-term benefits but do not provide immediate technological solutions. This is pointed out as perhaps one of the factors behind a crisis in fundamental science (especially physics) that are perceived by some.(Smolin, 2007) This is not a uniform trend in scientific knowledge production, by any means, with large numbers of scientists still engaging in asking fundamental questions on the nature of reality and what it means for us. However, they are in a minority and often not in line with how the institutions of science operate.

In the context of the mobilisation of large amounts of the state's resources for large-scale science, as well as the ever-increasing presence of science and technology in people's lives, new ideas on the relation between science and society began to emerge. Science and society studies (also known as Science and Technology Studies, or STS) as an academic discipline emerged in the mid-twentieth century, in a response to the necessity of understanding the complex interactions between science, technology, and society. The discipline has grown in importance as the role of science and technology in society has become increasingly prominent.

Science and society studies thus emerged in the post-World War II period, a time of great scientific and technological advancements. The development of the atomic bomb and the advent of nuclear power raised questions about the impact of science and technology on society. The impact of these technologies on society was not fully understood, and there was a growing concern about their potential for harm.

At the same time, there was a growing interest in the social and cultural dimensions of science and technology. This interest was driven by the realization that scientific and technological advancements were not just the result of scientific inquiry but

were also shaped by social and cultural factors. This led to the development of a new academic field, which focused on the intersection of science and society.

Philosophy of science, which dominated the thinking about the relationship between science and society until the 1970s, usually accepted the basic premises of modern scientific research, and understood science as the autonomous pursuit of knowledge. (Merton, 1973) Science was conceptually idealised as neutral and independent of social, cultural, economic and political factors - thus produced only according to rational and cognitive processes and factors. Further, when social or cultural factors enter or influence scientific discourses, they are viewed as creating biases that can be ideally excised to progress to a more pure science.

The earliest precursor to science and society studies was the sociology of science, which emerged in the 1930s and 1940s. The sociology of science focused on the social factors that shape scientific research and the social consequences of scientific discoveries. This early work laid the foundation for the development of science and society studies. In the 1960s and 1970s, science and society studies began to emerge as a distinct academic discipline. This was driven by a number of factors, including the increasing public concern over the potential dangers of scientific and technological advancements. The discipline also benefited from the growing interdisciplinary nature of academic research, which brought together scholars from a variety of disciplines to study the relationship between science, technology, and society.

One of the most significant contributions to the development of science and society studies was the work of Thomas Kuhn. In his influential book, *The Structure of Scientific Revolutions*, (Kuhn & Hacking, 2012), Kuhn argued that scientific knowledge is not objective and value-free, but is instead shaped by social and cultural factors, particularly the assumptions and frameworks that scientists use in times of "normal science". When the basis of their assumptions and frameworks become untenable, there occurs periods of "revolutionary science", when "paradigm shifts" occur. Further, scholars such as Bruno Latour (Latour, 1987) and Sandra Harding (Harding, 1992, 1998) have built critically upon these and other ideas to

examine science as a social institution, and scientists as social actors placed in networks and how their actions and thoughts are often inseparable from their positionality.

Another significant contribution to the development of science and society studies was the publication of the journal *Social Studies of Science* in 1971. This journal provided a platform for scholars to publish research on the social and cultural dimensions of science and technology. It quickly became the leading journal in the field and helped to establish science and society studies as an academic discipline.

These critical approaches to science as a corpus of knowledge, a collection of institutions and a process of understanding have created a more nuanced view of how we gain and use knowledge of reality. In revealing the complexity of science, this body of theory has perhaps helped align our understanding of reality with a more true vision of it, as a complex system. This perception of complexity without the sufficient social and psychological tools to deal with them, is perhaps one of the factors that has pushed our times into a permanent crisis.

1.7 Science at Present: Crises, Risk Society and Post-Normal Science

The role of knowledge in informing how individuals and groups of individuals live their lives undergoes radical changes in times of crises. Ulrich Beck's thesis of risk society (Beck, 1992) generalised this idea into a claim that we are living in a second, reflexive age of modernity, as part of a risk society - characterized by the continuous, omnipresence of technological risks with low probability but high consequence.

The concept of post-normal science is one in a similar vein, emerging in the context of debates about how to address the uncertainties and complexities of scientific inquiry in a rapidly changing world. Post-normal science recognizes that many

of the issues we face today, such as climate change, involve high stakes and profound uncertainty, as well as significant value conflicts and social implications. In such cases, traditional scientific approaches may not be sufficient, and new models of scientific inquiry are needed that can accommodate multiple perspectives, uncertainties, and values. (Funtowicz & Ravetz, 2018) The context of the COVID-19 pandemic is one where the concept of post-normal science has been mainstreamed. In (Waltner-Toews et al., 2020), the authors argue that: "In addressing the local pandemics science has never seemed more needed and useful, while at the same time limited and powerless. The existing contract between science and society is falling apart. A new covenant is urgently needed to navigate the days ahead."

As we better understand the complex natures of systems, we are perhaps at a Kuhnian scientific revolution, with an era of revolutionary science. (Kuhn & Hacking, 2012) However, the social conditions, as ever, are perhaps unready for the flux that will be caused by the scientific and technological changes that are happening.

The nature of scientific knowledge itself and the role of scientific knowledge in society, the scientific publics and the scientific public spheres, the civic epistemological consequences of science and its relation to society, are all questions that require consideration. It is in such a context that considering how an entity like the Kerala Shastra Sahitya Parishad operates in the present becomes interesting.

Chapter 2

The Kerala Shastra Sahitya Parishad

The Kerala Shastra Sahitya Parishad¹ (KSSP) - more generally known as Kerala's People's Science Movement, but can be translated to Kerala Science Literary Forum - is an organisation founded in 1962 and its associated movement, with the slogan "Science for Social Revolution" that was adopted in 1972. Thus, the KSSP celebrates its 60th anniversary in 2023. It has played a decisive role in the scientific public sphere and in the process of social mobilisation in Kerala, especially in the latter half of the 20th century.

According to its own stated goals, the KSSP "strives to:

- Popularize science and scientific outlook among the people.
- Develop a sense of optimism in them, instill in them a sense of self-confidence that they can change the world and can build a better tomorrow.
- Expose and oppose the abuse of scientific knowledge detrimental to the interests of the majority.
- Expose and oppose the abuse of environment.

¹Alternatively anglicized as Kerala Shastra Sahitya Parishath

- Propose and help implement, alternative modes for development, with emphasis on equity and sustainability.
- Carry out R&D work to transform lab technologies in to mass technologies.”

2

The KSSP engages with science and society through a variety of means. They include publications, surveys and studies, grassroots events by various members and local groups, conferences, seminars and so on.

The KSSP publications include two monthly magazines 'Shastrakeralam'(Scientific Keralam) aimed at secondary school students and 'Shastragathi'(The Direction of Science), the primary outlet of the organisation aimed at a general audience. It also publishes 'Eureka', a biweekly magazine for primary school students, and a newsletter for members called 'Parishad Vartha'(Parishad News). The KSSP has also published around 1100 books and hundreds of pamphlets. The organisation relies on its publications both for spreading its ideas as well as to meet its financial requirements. It claims that two of the most popular books in Malayalam are published by it : 'Enthukond? Enthukond?'(Why? Why?) - a collection of scientific curiosities - and 'Vayichchaalum Theeraththa Pusthakam'(The Book that One Can't Finish Reading) - a children's book about nature.³

The KSSP has an active online science portal that reports on new scientific breakthroughs, debates on science, and other science-related issues, and acts as a place for answering science questions that readers may have.

The most recent major study done by the KSSP is the 'Kerala Padanam'(Kerala Study), conducted in 2004. It was an extensive survey of around 6000 households in Kerala, by trained volunteers, informed by consultations with many social scientists. The activists spent extensive amounts of time with each family in order to understand their lifestyle and their thoughts. It sought to answer the questions "Keralam engane jeevikkunnu?, Keralam Engane Chinthikkunnu?"(How

²<https://kssp.org/kssp/>

³<https://kssp.in/books-pamphlets/>

Does Keralam Live? How Does Keralam Think?). The findings were published in a book.(Kerala Sasthra Sahitya Parishad, 2017)⁴

The KSSP has also been involved in developing technological solutions or products for local needs, the most famous being the "Parishad Adupp"(Parishad Stove) - wood burning stove, that uses less wood and also keeps most of the smoke from burning out of the kitchen by expelling it out through a pipe. Other products include a Hot Box ("an energy efficient thermocol box which keeps the temperature intact for hours, thereby saving energy and fuel". It is useful for cooking rice, and for keeping food hot.), and a portable biogas plant. These products and others are often developed by the Integrated Rural Technology Centre (IRTC), a research centre established by the KSSP. Another research centre set up by the KSSP is the Educational Research Unit (ERU), which conducts studies on education policies, curricula, pedagogy, teaching aids and so on.

These activities and institutions emerged out of the decades of work of the KSSP. We will now look at some historical context of the KSSP.

2.1 People's Science Movements

The People's Science Movements (PSMs) India consist of many grass roots groups, coming from a variety of ideological backgrounds and historical conditions. Scholars often include a broad variety of movements under the banner of PSMs (Varma, 2001), as long as the movement has a popular nature and an engagement with the relationship of science and technology to society.

PSMs are difficult to define, and often to delineate, due to their diversity in terms of membership, strength, organisational structures (or lack thereof), strategies, focus areas, and histories. They vary from groups of a few individuals in a particular area, to sustained mobilisations of thousands or tens of thousands. Some of them, such as the Paschim Banga Vigyan Mancha, can trace their origins to activities

⁴https://wiki.kssp.in/images/a/ab/Kerala_padanam_final.pdf

in pre-independence India, while some are more recent, using the possibilities of new information and communication technologies to popularise science. Some PSMs, such as the nuclear disarmament movement, are formed in focus around a single issue, while others interact with a vast range of issues and topics. They all, in various ways, work on reducing disparities in scientific knowledge, but some of them promote alternative development models, ostensibly based on local or indigenous Indian science and technology.

They are thus often committed to different notions of the role of science and technology in society, and thus encapsulate a diversity of activities. Their activities have been framed in terms of their relationship to developmental modernity, and to the two sides (or approaches) in what is often termed the 'science wars' in India. (Nanda, 1997) On one side, they have been viewed as seeking to disseminate the worldview of modern science among the people, in order to generate 'scientific temper', in the legacy of Nehruvian developmentalism. (Mahanti, 2018) In contrast, they have also been viewed as opposing development which is based on modern science and impoverishing the majority, perhaps in line with what has been called the 'humanistic temper'. This has been particularly true of movements like the KSSP, which are not centralised and engage with a wide range of issues.

We could argue that the conceptualisation of the 'science wars' in India is a flawed lens through which to analyse these movements, since it suggests a 'two cultures problem' where two versions of reality are on either side in serious conflict, wherein the popular nature of the movements along with their emphasis on science create a complex and dialectical space. (Varma, 2001)

However, in the case of the KSSP, there is a persistent inclination, and perhaps even a clear dominance, of the validity of the overarching thesis of developmental modernity, even while spaces within the movement have formulated critiques of it. This is reflected from its very origin.

2.2 The Origins of the KSSP

The KSSP has been widely recognised as one of the first, and the most influential of the People's Science Movements in India, as demonstrated in this description from the website of the Paschim Banga Vigyan Mancha: "Peoples' science movement with well defined objective was first initiated in the state of Kerala. As far as our Country is concerned, PSM emerged for the first time (in term of statewide movement with clear-cut program) by the formation of Kerala Sasthra Sahitya Parishad (KSSP)." ("About, Paschim Banga Vigyan Mancha", n.d.)

The origins of the KSSP can be traced back to the confluence of the endeavours of different groups of a mostly middle-class scientific-citizen public who took on the task of propagating science and the liberal Enlightenment values and visions it had embodied, to the wider population. The two primary groups of people from whom the organisation's initial core was formed were science writers (and science enthusiasts interested in science writing) in Keralam organising in a professional capacity, and young Malayali scientists working at national research institutions (primarily at the Bhabha Atomic Research Centre, Mumbai) - many of whom had received technical training in the USSR and engaged in discussions on the social responsibility of scientists and their duty to spread scientific knowledge among the masses.

The initial stages of the KSSP, as a group of science writers, was primarily focused on science writing and dissemination of scientific information in Malayalam - particularly issues of translation of technical terms. Soon, with the association of technologists and scientists, the broader goal of spreading scientific ideas in order to cultivate scientific temper to advance social goals in accordance with a Nehruvian conception, albeit influenced by the critical lens of the Communist movement as well. Early influences on the Parishad include J.B.S. Haldane and J.D. Bernal, Marxist thinkers and scientists. Haldane was one of the foremost and most influential science popularisers in the 20th century. Bernal's books such as *The Social Functions of Science* (J. D. Bernal, 1939) and *Science in History* (J.

Bernal, 1954) on the social and political contexts of science and the economic influences on scientific development were early influences on the founding members of the KSSP.

The objectives of the KSSP, as stated at the time of founding, were:

- to cultivate an interest and awareness of modern science among the masses;
- to that end, publish science books and periodical in Malayalam;
- to organize meetings, discussion, science film shows; and
- to assist other organizations working towards similar goals.(Zachariah & Sooryamoorthy, 1994)

However, from the mid-1970s onwards the KSSP developed a broader critique of science's social relations in a capitalist society, and proposed a people's reclamation of science towards the goal of social transformation. This ideological shift envisaged a new kind of scientific citizen-public that engaged with science more critically, but was still largely convinced about its epistemological supremacy in the tasks of providing technical solutions to the problems of society.(Varughese, 2017d)

2.3 KSSP's Approach to Science

Following the initial influences of Bernal(J. D. Bernal, 1939), science has been used in a variety of meanings by the KSSP: as institution, method, accumulated knowledge, a part of forces of production and as a part of a worldview.

It has always purported to emphasise "the unity of hand and head, theory and practice, science and technology and natural and social science." (T. M. Isaac & Ekbal, 1988) In its early days, in an effort to understand the philosophical problems of science, a five day study camp was conducted in early 1980s, with a

focus on elaborating a critique of the revivalist ideological currents in the Indian science movement.

The KSSP from the early days, had a relatively nuanced view of science, especially compared to the existing critical frameworks. For example, the statement: "If science is defined as merely accumulated knowledge of laws of nature it is neutral and objective. But if science defined in a broader sense to include the process of asking questions and the application of the laws, i.e., as a social activity, it cannot be neutral. The questions raised and the uses made of the answers are socially determined." (T. M. Isaac & Ekbal, 1988) However, they go on to say, "It does not imply, however, as certain science groups have argued, that the modern science is capitalist or imperialist in nature and has to be rejected. Because whatever be the nature of the society in which science develops to enable successful progress of production, it has to reflect the objective reality. Even though science develops as a specialised activity, its roots are in production and fruits are for production. It is the primary social function of science." And then they conclude by saying, "But the extent that the ruling classes attempt to use science as an instrument to control and manage social affairs the ideological preconceptions influence and condition the development of science. Therefore it is important to expose the anti-people ideological preconceptions that enter into scientific theories. It is also important to develop a critique of the science policies from the point of view of the people and pose alternatives that are more responsive to the requirements of the people."

In setting out its positions, regarding what it means by science it articulated them as such: "(a) Instead of equating it with certain branches of knowledge, science must be perceived as a process or means by which human beings attempt to explore relationships between cause and effect, whether in the natural or social world. (b) The Process of science and the uses to which the conclusions of science and its applications (i.e., technology) are put, depend on human decisions. (c) Those human decisions are now resulting in grave social problems such as immiserization. Such decisions must be changed. To do so, science must be compelled to serve the people and not just the elites who are now served by it." (Zachariah

& Sooryamoorthy, 1994) Since 1973, KSSP has maintained this stance to a large extent, which increased the organization's popularity among ordinary people.

Thus, the slogan adopted by the KSSP in 1973 at its annual conference - "Science for Social Revolution" - can be seen to be quite reflective of its positions, inspired by primarily Marxist understanding of society and social change, combined with an organic emergence of ideological moorings, that arose in the context of a popular movement. It also retained strong elements of the legacy of the anti-feudal and nationalist movements - ideas which shaped the Communist movement as well. (T. M. T. Isaac et al., 1997)

Even as the dominant strand of critique of science in India moved towards a Gandhian perspective informed by post-structuralist trends, starting from the 1970s itself, the KSSP membership has been significantly more aligned with the Marxist viewpoint, even while often making space for many of the critiques raised by the various new approaches in the social sciences over the 21st century.

2.4 Shastra Kala Jatha

After 1970, the KSSP introduced Science Jathas (science marches) as a means of communication. Gradually, elements of performing arts were added. Up to 1975, the Science Jathas did not contain any performing arts activity. It would consist of a team or a few teams of KSSP activists who toured throughout the state halting at various points and delivering lectures on science. However, soon local KSSP activists began to produce and present street plays, folk dance and songs on various science and social themes to attract large gatherings at the sites of delivery of science lectures. Eventually, the various performing arts were fully integrated and used to communicate the scientific and social messages, and the Science Jatha was renamed as 'Shastra Kala Jatha'.

2.5 KSSP and the Scientific Public Spheres

The KSSP was the defining actor in the Scientific Public Spheres of Kerala in the 1970s and to a lesser extent into the 1980s. However, as time went on, the wider spread of media as well changes in the social, economic and political atmosphere, created alternate venues for public engagement - along with science and different models of engagement and activism - overshadowing the KSSP.(Varughese, 2017a)

The KSSP's primary model of engagement can perhaps be seen as being a broadly diffusionist or deficit model, where the scientific public sphere facilitates the diffusion of scientific knowledge and enables the public to access, understand, and evaluate scientific findings and claims, fostering public literacy and engagement with science.(Varughese, 2017c) However, the deficit model often perceives the public as a passive homogenous category of the uninformed to whom scientific knowledge must be disseminated. (Varughese, 2012)

However, the nature of the activities of the KSSP, when interpreted as a 'New Social Movement', can be viewed as being more complex. While the movement might indeed have begun as a middle-class or elite effort at popularisation of science, its transformation into a movement with a strong political commitment and a popular nature, created a more deliberative sphere. The movement created a new generation of activists who go on to become both leading members of the KSSP as well as prominent members of the wider civil society as artists, politicians, technologists, teachers, and so on. The movement perhaps retained a middle-class nature at the level of the leadership, but it created a class that might be called organic intellectuals in the context of Kerala, through the wide participation - particularly of young people - in its activities.

In almost all instances of public engagement with science and technology in Kerala, one can observe the presence of KSSP members or associates. The KSSP membership raises issues they feel are important - particularly focusing in recent times on countering pseudoscience or what they perceive as misuse of science - as well as react to issues from the perspective of science enthusiasts and practitioners.

One of the primary lenses through which one can approach the KSSP's engagement with science and society is through that of its relationship to development.

2.6 KSSP and Development: From the 1970s to the 1990s

The Parishad has been pivotal in the attempt to evolve an alternative set of development policies in the context of Kerala. The primary point at which many see this emerging is the KSSP's critique of and mobilization against the developmentalist state in the context of the debate around Silent Valley Hydroelectric Project. In this debate, the KSSP activists positioned themselves as rejecting both the developmentalism of the state, and the "romantic" resistance symbolised by poets and cultural figures. Rather, the KSSP operated in technocratic terms, emphasising the idea of a proper cost-benefit analysis and argued that the project was more likely to produce loss rather than benefit. The KSSP, thus situated itself in a space of a left-critique of developmentalism while retaining a belief in a Nehruvian developmental modernity. It often became a convenient space for figures associated with the state or with the Communist Parties to voice internal critiques with the backing of an often technocratic, yet popular ideological commitment, and the support of a popular movement. (Devika, 2023)

In the 1980s, the existing models did not appear to be providing expansion in life-choices, especially as educational attainments and financial demands advanced while the economy became stagnant. This was a source of a marked increase in migration in this time period as well.(Kannan, 2023) In this period, when it had an active, popular presence in the public sphere, the KSSP's interventions often sought to highlight this stagnation or even decline. This is the period in which many of its most famous cultural activities were organized, as well as institutions such as the Integrated Rural Technology Centre (IRTC) and the Educational Research Unit (ERU) were set up.

In the 1990s, the liberalisation, privatisation and globalisation drives in the Indian economy, as well as the emergence of a middle-class sensibility combined with a capitalist triumphalism, created fresh challenges. The KSSP engaged in efforts to build a bottoms-up model of local governance in the 1990s, in line with the idea of decentralisation, which could be seen as an effort at shoring up the existing social models of development and governmental techniques and to provide a possibility to counter unbridled capitalism.

The KSSP, therefore, can be seen to have made an attempt to change the nature of liberal and capitalist governmentality through the People's Planning Campaign and the subsequent substantial technical support provided to local governments in setting up their capabilities, particularly in the areas of health and sanitation. It attempted interventions into the politics of data, attempting to expand the sphere of public deliberation and enhancing popular participation in knowledge-creation through many exercises.

Perhaps most importantly, it brought (or attempted to bring) a focus on the local and the neighborhood, creating mechanisms (with varying degrees of effectiveness across time, space and constituencies), of deliberation dialogue with the state and with institutions, thus enabling an alternative to seeing the people as merely faceless masses who are to be the targets of developmental interventions. This also is significant since increasing inequalities in distribution of gains of development and subsequently in the increased differentiation between classes, meant that the gains of redistributive policies (as they were) could be reversed as institutions would be more amenable to middle-class or elite demands. The local, depending on context, can be seen as where people - particularly the non-elite - locate their sociality, could thus become a context for institutional interface, and social and political action more readily.

Thus, in spite of many fatal flaws - such as a disinclination to support or become a part of oppositional civil society elements instead of the dominant left seeking to renew itself (Devika, 2008) - the KSSP played a central part in establishing the basis of the local self government institutions and a social milieu of relatively more

distributed institutional power. As J. Devika puts it: "Nevertheless, the focus on the local and neighborhood as a potential site of a new sociality that could be harnessed for a more democratically-oriented biopolitics was unmistakable."

However, she also points out how "even its best minds were unable to free themselves from their own elite social moorings" and how Dalits and Adivasis, and their movements were still excluded almost completely from the purview of these new democratic spaces. They were also most often unsuccessful in progressing from inherited ideas of gendered relations, families and hierarchies.

The leadership of the KSSP as an organisation had tended to be middle-class since its conception - with the typical active member often pictured as being a school teacher. The institutional and official linkages into which many of the younger members moved on in the period of the late 20th century was a major factor in the influence the KSSP had on the state. However, these same linkages can be seen to have caused the KSSP to become less confrontational to institutions as well. Thus, the KSSP often leaned towards enhancing the role of expertise and cementing ideas of neoliberal governmentality that was rapidly ascendant, irrespective of intentions.

This neoliberal governmentality tends to reduce groups excluded from the 'Kerala Model' into categories of beneficiaries, and does not enable their entry into processes of deliberation. But, on the other hand, due to the localisation of institutions and their extension, many such groups became visible to the welfare state for the first time, however minimally. They could now access their position as citizens who could be the consumers of government services such as roads, water supply, and electricity.

However, the failure to convert the limited successes of decentralisation of institutions into a new sociality and democratic sensibility among the wider population, including the failure to confront exclusions, has prevented the society in Keralam

from being able to resist the factors which have led to the crises of the new century, including overwhelming individualism and consumerism which routinely renders collective interests invisible and extraction-fuelled capitalist growth leading to breakdown of social and ecological systems.

Thus, the KSSP is now faced with many challenges. As well as those stated there, there is a challenge to its established ideas on science and its relation to society through newer articulations of science critique, particularly those from post-structuralist viewpoints, and critiques of the adherence many of its prominent members to Marxist frameworks. There is also a perceived return of the influence of superstitions and pseudoscience in the public sphere, and a national political climate that enhances this and challenges the rationalist inclinations of such a popular science movement, along with its advocacy of progressive values.

2.7 Activities of KSSP during COVID-19

The KSSP was one of the many civil society organisations that stepped up during COVID-19 to shore up the state's efforts at resisting the effects of the pandemic. Many of the KSSP membership are part of the medical community, and associated with the state's COVID response as well. In addition, the KSSP membership, at various local levels conducted awareness campaigns⁴ and worked with their local self government.

In addition, an organisation called Campaign Against Pseudo Science Using Law and Ethics (CAPSULE) was formed as an initiative of members of the KSSP, primarily as a reaction to pseudoscientific medical claims and medical malpractice. (Jayanth, 2019; The New Indian Express, n.d., 2021; Unnikrishnan, 2022) They also conducted surveys and studies during the pandemic on topics such the role of enclosed spaces in increasing spread of the COVID-19 virus (The Hindu,

2020a), gender relations and domestic violence during the lockdown⁵, the conditions of the unorganised sector during pandemic (Jayanth, 2020), and usage of masks among people.(The Hindu, 2021)

The KSSP also conducted a study on the shortcomings of the digital classes conducted by the state government(“Opposition Corners Kerala Government on KSSP Report”, 2021; The Hindu, 2020b)

Many of the KSSP’s activities were shifted online, as with many other organisations. However, due to the nature of KSSP as reliant on its wide network of grassroots activities, this was a heavy blow to the organisation. However some of the activities that are usually conducted in workshops were shifted online as well. In the next chapter, we will examine one of the platforms for this shift - the ”Science Kerala by KSSP” YouTube channel, and use the content on it to formulate our analysis.

⁵In association with Kerala Institute for Local Administration, as mentioned in the video on ”Gender troubles..During and after COVID times”

Chapter 3

Science Kerala by KSSP

”Science Kerala by KSSP” is the official YouTube channel of the KSSP.¹ It acts as a platform for the Parishad to publicise its many events, and engage with a newer medium in its mission of science popularisation. During the COVID-19-induced lockdowns, the YouTube channel became activated, and many of the events and activities that are normally conducted offline, were now made available through this portal.

As a platform, YouTube is one of the largest in the world. It is an example of a Web 2.0 platform, where prominence is given to User Generated Content (UGC), but has a significant presence of Professionally Generated Content (PGC) as well. (Welbourne & Grant, 2016) Here, PGC implies content generated by traditional video producers such as television, film or media organisations. Therefore, UGC also includes content produced professionally, but varies highly in terms of the background of production and resources utilized.

Due to the algorithmic nature of the platform, it is not easy to identify trends in media consumption from outside, since the suggestions received for each individual is based on their individualised consumption, as well as the commercial incentives of the platform itself. However, some trends such as in the type of content that is likely to get more viewers has been discerned, both by creators on the platform to

¹<https://www.youtube.com/ScienceKeralaByKSSP>

stay relevant, as well as by researchers. The tendency of the suggestions to isolate a viewer into a silo of similar content means that a single viewer often does not access many different kinds of videos. Thus, while popular science is perceived as a highly viewed topic on YouTube, many users might not ever watch any video on such a topic.

Apart from its presence as a platform in itself, YouTube is also significant in its role as a video-hosting agent, i.e. as a site for anyone to cheaply, without the need for significant digital storage, upload their videos, and subsequently share them with others. Unlike other social media platforms where videos are only one feature, and hence have limitations of either having to be logged in to watch them, or having time limits on them, YouTube videos can be easily shared and viewed on messaging platforms such as WhatsApp. This feature of the platform enables many organisations and individuals to use the videos hosted on YouTube as a cheap way of spreading video content.

The tendency of engagement with video content is seen to be more than with textual content, in terms of time that people spend on it. It could also be claimed that engagement with video content is better than with text in terms of emotional engagement, sympathising with the points made, and recall of particular information conveyed.(Yadav et al., 2011)

As the reach of science content through traditional media is seen to decline, and there is a renewed need felt for science awareness, many institutions and scientists are turning to YouTube as a tool for communicating directly with non-expert publics. However, there is little empirical social science research guiding their efforts.(Yang et al., 2022) Video characteristics, as well as cues provided by the audience - which indicate social endorsement, such as likes - might influence user engagement with online science videos. There is evidence that shorter videos are more likely to be viewed and that likes have a consistent positive association with all types of engagement.(Yang et al., 2022)

Thus, YouTube can be seen to be possibly be a significant part of science communication at the present time. However, there are challenges to this, such as the

factor that since the content on YouTube is generated by users, the platform is particularly vulnerable to misinformation and conspiratorial videos. There is also a role played by YouTube's recommendation algorithm in unwittingly promoting questionable content that is widely recognised, but not well understood, which potentially makes the problem even worse. This could have dire real-world consequences, especially when pseudoscientific content is promoted to users at critical times such as the COVID-19 pandemic. There is indication that YouTube's recommendation algorithm is more aggressive in suggesting pseudoscientific content, especially when users are searching for specific topics.(Papadamou et al., 2022)

Thus, the KSSP's decision to activate its presence on YouTube, and to include it as a medium for its mission of science popularisation and development of a scientific public, is in line with the general trends. As an alternative platform, it provides the KSSP with a prospective new and wider public.

There is also a significant point that if one looks at the number of views, many similar channels in YouTube - such as Biju Mohan channel², or many of the rationalist channels such as the Kerala Freethinkers Forum ³ - seem to have a much larger viewership, but many of the videos of public events on these channels are of events associated with or organised by the KSSP. This highlights the role of KSSP as enabling public forums where much of the public discourse of Keralam happens.

For the purpose of this research, the channel provides us with a venue for the analysis of the activities of the KSSP, and the content on the channel provides us with an insight into the current state of the organisation as well, in terms of attitudes, perceived challenges and the envisioned solutions.

²biju mohan - YouTube

³Kerala Freethinkers Forum - kftf - YouTube

3.1 A Note on Methodology, and Some Preliminary Analysis

A list of all the videos on the channel, as well as a few details about them - such as time and date at which published to the channel, number of views, number of comments and number of likes - were obtained through a Python program and the YouTube API.⁴ The vast majority of videos uploaded on the channel were after the beginning of the COVID-19 lockdown, with only 8 videos before then. As of March 1st, 2023, there were 576 videos published on the channel.

If we examine the number of views of videos, we see a majority of videos with high views are between October and December in 2021, and from the two interactive activities - Vijnanotsavam and 100 Days Science Experiments - for children, which will be elaborated upon in the following section.⁵ Many of the other videos with high views were also those either aimed at children - such as children's songs - or at parents and teachers, on dealing with online education during COVID-19.

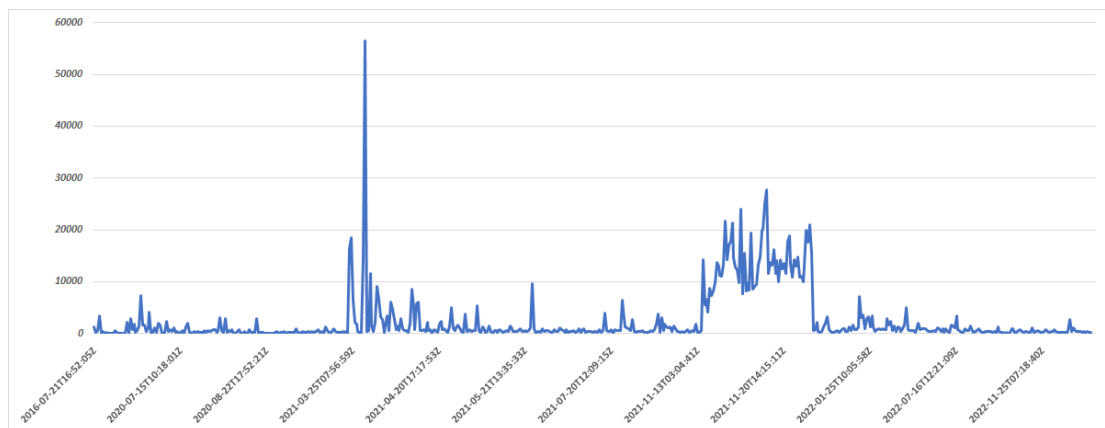


FIGURE 3.1: Number of views on videos over time

⁴Refer Appendix A for the code.

⁵The number of views on some other videos may not be particularly indicative of how many people watched them, as videos viewed in WhatsApp, on Facebook do not add to the number of views. Many of the events are also uploads of live events. The high number of views on these videos perhaps indicate that they were primarily viewed on the YouTube application on phones or on the YouTube website.

Another section videos with a large number of views can be seen to be recordings of songs and dramas from the Parishad "Kalajatha"s (Art march - a form of public art that the KSSP pioneered).

There are also a number of panel discussions and presentations. The presentations include a wide variety of formats such as seminars and speeches, as well as a large number of informational presentations by experts on particular topics, particularly in light of COVID-19.

The KSSP also produces documentaries, which are uploaded on the YouTube channel. These include "Unarththupaattukaar" (Singers who Rouse), on the Shastra Kala Jatha as a public scientific and social exercise. There are many videos of songs and plays developed and performed in the Shastra Kala Jathas over the years, as well as videos that recall the activities and evaluate them⁶. The Shastra Kala Jathas are a major component of the nostalgia that many feel for the Parishad's activities during the 1970s and 1980s.

Other documentaries include "Nilavili" (Scream), an exploration of the destructive environmental practices all over Kerala, focusing on the themes of soil, water and trees; a documentary on the Vizhinjam Port development; one on 50 years of Parishad activities; and "Venam matoru Keralam" (Need Another Keralam) on the 2012 march with the same slogan, which, among other things, highlighted the necessity of social and ecological change.

We will now first focus on two representative types of videos on the channel: videos on activities for children and videos on a series of panel conversations. Then, we will examine some of the content related to the Jana Nava Kerala Padayatra, and subsequently conclude by looking at some themes revealed through these and other videos.

⁶"Kalaaajatha: Oru Vishakalanam" (Kalaaajatha: An Analysis)

3.2 Activities for Children

Activities and presentations for children have always been a key part of the KSSP's work of science popularisation and social transformation. The "Balavedi" (Children's Stage) as a form of Parishad activity has been ongoing since 1978.

Two of the prominent activities that were conducted through the YouTube channel include the "Vijnanotsavam" (Knowledge Festival) which consists of different series - aimed at Upper Primary (UP) students, Lower Primary (LP) students and High school students - of short videos providing instructions for activities, games and exercises for children, and "100 Dina Shastra Pareekshanangal" (100 days' Science Experiments) where simple, but interesting science experiments were demonstrated and children asked to try them at home.

3.2.1 Vijnanotsavam

The Vijnanotsavam is an annual series of activities conducted by the KSSP, in association with the cooperation of the Education Department, primarily in the state's government schools.⁷ The theme for 2021 was "Arivu nirmikkunna kutti, swayam vilayiruththunna kutti" ("Child who creates knowledge, child who self-evaluates")

Activities are provided in 6 baskets, with 5 activities in each basket. The baskets for 2021 were making, experimentation, creative illustration, creative writing, games and observation.⁸ Of these, the children involved could perform any activities that they were interested in, with the help of people around them. If they want, children can choose to get evaluated on their activities, by peers and teachers, as well as doing self evaluation. If they choose to get evaluated, and complete 6 activities successfully over 10 to 15 days, they can There was co-ordination of the activities through WhatsApp groups.

⁷<https://edu.kssp.in/>

⁸Video of Introduction to Vijnanotsavam 2021 , Video of Explanation of the Vijnanotsavam 2021 by Subcommittee Chairperson

The activities are aimed at promoting a sense of the presence of science in everyday life and introducing children to various arts, crafts, and games as well as to scientific ideas. Thus, it creates diverse and engaging ways to engage with science, for children - to make their homes and surroundings into a site of learning.

3.2.2 100 Days of Science Experiments

It was organised by the the Kasargod unit of the KSSP, and conducted by Dinesh Kumar Thekkumpad - a science teacher and science populariser. It is a translation into a video series format, over a 100 days, activities that would normally be conducted in schools or workshops.

Rather than a simple demonstration of a fun experiment, the presentations of the experiments are explicitly structured and designed to engage the children to ask questions and create a sense of the science and of scientific thinking. The experience of the presenter in conducting these for many children comes across in the presentations.

3.2.3 Other

Videos of songs and classes for children are also present. They are likely to carry a strong message. The songs are more likely to have a social message, with the underlying message that social injustices arise from falsehoods and abuse of power. For example, the song "Poovali Payyinte Jaathiyenthamme"⁹ (What is the jati of the little calf?), has an anti-caste, anti-religion and anti-communalism message, telling children how absurd it is that people have these divisions unlike animals.

Thus, there is an attempt to translate a range of activities and media that evolved through its years of work in the field into a new medium, particularly in the context of the lockdowns during COVID-19. The effectiveness of this attempt in the absence of live, physical interactions might be questioned, since that is one

⁹<https://www.youtube.com/watch?v=2PoQJ9bPK4I>

of the main attractions of activities such as experiments. However, both from an accessibility point of view, and due to the handing over of some agency to the children to carry on to take the next steps on their own, there is likely to be a positive impact for the uploading of the videos.

3.3 Marivillu: Science Conversation Evenings

”Maarivillu - Shaastrasamvada Sandhyakal” i.e. ”Science Conversation Evenings” under the title ”Rainbow”, were a series of live, online panels and events on various topics conducted over a week in January, 2022 on the Science Kerala by KSSP YouTube channel, in association with LUCA, the online science portal of the KSSP. The different topics covered were:

1. ”The superstitions that Malayalis delight in”
2. ”The thoughts of the youth on popular science”
3. ”Are the brains of women 5 ounces less?”
4. ”When child YouTubers gather”
5. ”Education in Finland - What Kerala needs to learn”
6. ”Parishad Song Memories”
7. ”One world, one health”
8. ”The freedom of expression that the constitution says - Is the cow on the page eating the grass¹⁰”

In this list of topics we can see a brief overview of the nature of topics that the KSSP initiates public discussions on. For instance, even though the event is titled to indicate that the conversations are on science, the final session, conducted on the 26th of January - the Republic day of India - is on the constitutional freedom

¹⁰Malayalam proverb on the reality of what is printed on a page

of expression, and the conversation does not touch on the relation of this to ideas of science. Rather, it approaches the topic from legal and political points of view, and in the face of the challenges to freedom of speech and expression in the present.

In the videos on superstitions and on young people, many of the challenges faced by the society in Kerala in general and the KSSP as an organisation are addressed as well, that we will examine again in the following section.

In the third session, a panel of scientists who are women discuss gender discrimination in science and through science, highlighting the role of scientific research used to perpetuate the view of women, as well as other categories of people, as less capable. They also highlight the institutional barriers that women - especially women from marginalised communities - face in pursuing scientific research, and how the proportions of women in science reduce at high stages of the academic progression due to gendered roles and the bias of institutions. They also touch upon the continuing roles of the KSSP in the progress that has happened in Kerala, as a movement that challenged gender roles and provided platforms for women.

The sessions on education in Finland, involving people with personal experience of the system, and the session on global health also highlight the focus that arises in the KSSP and the wider developmental discourse in Kerala on education and health.

The sessions on the thoughts of youth on popular science and the meeting of child YouTubers, where children at the Upper Primary and High School level who do science popularisation on YouTube, reflect the attempts of the KSSP to engage with a younger generation, which could be connected to a perception of the KSSP getting outdated and out of touch with the young. However, there emerges a picture of the KSSP as a still significant presence in the consciousness of younger people as well.

The session on the songs of the KSSP Kalajatha.

3.4 COVID-19

There are a large number of videos on the YouTube channel on many different aspects of the COVID-19 pandemic. These include videos that seek to inform and update the public on the changing situation as the pandemic proceeded, as well as broader discussions on the social implications of the pandemic. These are some of the most viewed videos on the channel.

Many of them present experts answering questions that people have, according to the latest scientific information available. These include questions such as whether COVID-19 spreads through air, what are the dangers of the Omicron variant of the virus, whether to be scared of the third wave of COVID-19 and what to do to resist, who all should get vaccinated, should pregnant women take the vaccine, what does the COVID-19 statistics of Kerala mean, does wearing a mask cause breathing issues, and so on. They tended to be aimed at conveying current scientific consensus of the time, reassuring the public, and combating unscientific claims.

There is a wide variety of attitudes among the experts - primarily medical doctors - who made such presentations, as well as presentations on other aspects of the pandemic, in terms of their approach to the uncertainty of the scientific information. All of them admit to some level of uncertainty, but many of them are focused on the aspect of reassuring the public to the validity of the state-recommended precautionary protocols and at combating the claims made against the scientific institutional consensus.

There were also presentations and discussions on topics such as mental health during COVID-19, the status of other medical programs such as those combating Polio and Tuberculosis, gender issues during COVID-19 and beyond, agriculture in Kerala during and after COVID-19, the post-infection effects of COVID-19, and so on.

3.5 Kerala Padayatra



FIGURE 3.2: A view of a stage of the Kerala Padayatra in progress

The KSSP, as part of the Jana Nava campaign organised a 34-day Padayatra (foot march) from Kasaragod to Thiruvananthapuram, (i.e. from the North to the South of Kerala, culminating in the capital), with the slogan "Shastram Jana Nanmaykk, Shastram Nava Keralaththinu" ('Science for People's Welfare; Science for a New Kerala'), starting on the Republic Day (26th January) 2023.(Anandan, 2023) The march was flagged off by Justice K. Chandru, former Judge of the Madras High Court and social activist in Kasargod, and concluded in Thiruvananthapuram with veteran journalist P. Sainath addressing the final session.

It is to prepare ground for face-to-face and public discussion on the challenges and opportunities in a slew of areas including education, health, environment, infrastructure development and livelihood. In a more digitised public sphere, it is an attempt at generating more conversation in line with the traditional methods of the KSSP. The last time the Parishad embarked on such a large-scale march was in 2012 with 'Venam Mattoru Keralam' (Need another Kerala) slogan when two sets of marches from either end of the State met at Aluva.

The march was led by different 'captains' in the different legs, most often local activists or eminent personalities. They include political leaders T.M. Thomas Isaac, M. Swaraj, and M. Liju, dancer Neena Prasad, writer Santhosh Echikkanam, poet Veerankutty, scholar J. Devika, transgender activist Sheetal Shyam, and so on. It was accompanied by the performances of the Kalajatha as well.

There were various events organised at the different legs of the march, in association with the varied local organisations present throughout Kerala such as libraries, art clubs and so on, as is often the case with Parishad activities, since at the local level, the Parishad often exists in relation with such associations. The role of the KSSP as a forum for diverse participants to gather and share a social vision is highlighted.

The campaign had many layers, with over a dozen State-level seminars; some 60 scientific studies and analyses, some of which are still ongoing; and the publication of 15 monographs on issues ranging from the way to a knowledge society, creation of happy villages, the potential to take forward the Mahatma Gandhi National Rural Employment Guarantee Scheme, on the development of sustainable transport infrastructure for Kerala, on reducing health inequalities, on curriculum reforms, and on the success story of environmentalism at Chengottumala.

There was an affirmation of the achievements of development in Kerala, as a place with social security for all, and a focus on maintaining this social security as well as creating opportunities for the new generations of educated youngsters as primary challenges. Another prominent concern was that the people's participation in governance has not progressed, but indeed has decreased, compared to the time of the People's Planning campaign. There can be seen to be a strong element of nostalgia present throughout the events as well, on the part of veteran activists.

Thus, the Padayatra, as well as the broader Jana Nava campaign, which has been initiated by the KSSP, aims to rejuvenate the social and political role of the Parishad in addressing the challenges in Kerala society in line of its wider social vision, based on science. It is aimed at overcoming the current media climate of

reaction, and to create a new public sphere, shifting the focus from manufactured conflicts and partisan debates to informed conversations. It aimed to be non-partisan, incorporating anyone who shares the social goals. However, the marked affinity to the left-wing parties was still present.

3.6 Thematic Analysis

In this section, we will reflect briefly on some of the themes that emerge from our analysis of the KSSP.

In many of the videos, there is mention by various persons that the KSSP has moved from its core purview of spreading "Shastrabodham" (usually used in parallel with scientific temper, but can be translated as scientific consciousness), to being stuck in developmental questions. This shift can be attributed to many factors, some of which we examined in the previous chapter, including a shift of the Kerala society from a primarily feudal agrarian society to a more egalitarian, welfare-based and redistributive economy and then to a middle-class oriented, consumption-based part of the wider neoliberal economy,(Mannathukkaren, 2023).

A claim has also frequently been made that the KSSP, and the popular science movement in general, remains moored in the understandings of an elite class demonstrated in their opposition to developmental projects as well as in their idea of science popularisation being focused on topics that may not have direct connections to the daily lives of people. The protests against the Silent Valley Hydroelectric Project and the recent stance against the K-Rail Silverline project were raised as examples of the former, and presentations on the latest Nobel Prize winning discoveries for the latter.

However, the claim of the KSSP being in opposition to developmental projects is often exaggerated, since the membership of the KSSP differs widely in their approaches to various projects, and often to the same project. The latter claim of irrelevant science is also perhaps misattributed, since the KSSP through the LUCA

online portal, through the YouTube channel and so on often address topics very relevant to people's daily lives as well, as demonstrated in the case of COVID-19. The core goals of the KSSP include both promoting a scientific consciousness, as well as bringing information of the latest developments in science to the Malayali public.

However, the alignment of the KSSP with a middle-class sensibility, here being primarily the sensibility of a white-collar professional class, is still a relevant critique. This can be seen, for instance, in the concerns that are raised - such as those about education and health, which often focus on the social spaces occupied by a professional class. We can also perhaps see that a large part of the content can be perceived as aimed at people already in the same sphere as the organisation, and thus perhaps not suited to spread the ideas to the wider public.

3.7 Scientific Temper

One of the guiding principles of the KSSP is spreading "Shastrabodham" (usually used in parallel with scientific temper, but can be translated as scientific consciousness) among the masses. While initially following a primarily diffusionist model, where the masses were seen mainly as receivers of scientific thought, to enable them to progress, as the activities of the KSSP evolved to be more popular, they took a more deliberative turn and a more democratic conception of science, relating scientific thinking to the everyday lives and problems of people.

We can examine three videos, which in some ways present outliers in terms of the views expressed, in order to see these ideas in action. These are the presentations "Scientific temper and Common Sense" by Dr. Vaisakhan Thampi and two presentations - on the development of scientific temper in India and on some misconceptions about the scientific - by Dr. Shinod N.K.

The presentation by Dr. Thampi, along with other videos by him on this channel and others present a view of science anchored in a desire to contrast it with the

lack of rationality in existing ideas, especially in superstitions. In doing this, and perhaps in an attempt at impressing his points on the audience, he makes several strong claims about science on such topics as the totality of science, the lack of contradictions in science, the independence of science, and so on. These are claims that do not take into account the work of scholars in sociology of science and philosophy of science, as well as often being *prima facie* false. This is reflective of a prevalent attitude among science popularisers. While the KSSP has often been much more nuanced in its presentation of science, the popularity of Dr. Thampi in science popularisation reflects that the public that consumes such content may be more receptive of such a reductive approach.

The two presentations by Dr. Shinod are much more interesting. The first one is on the 'scientific temper' versus 'humanist temper' debate in India that was briefly mentioned in the previous chapter, and comes down quite firmly on the scientific temper side, using the work of Meera Nanda (Nanda, 2006) as an anchor. However, in the following presentation, he presents ideas from sociology of science, critiquing the authoritative claims of science and the attitudes of scientism, which lie in opposition to the ideas in the previous. This change, if one were to speculate, can be seen as reflective of a process that many observers of science go through, from a perspective that falls on one side of the debate to a recognition of the merits of both sides.

3.8 Conclusion

The YouTube channel of the KSSP is a continuation of the work of the KSSP as well as an extension of the KSSP into a new medium and mode of communication, to maintain its relevance in a new media environment. In combination with persistent grassroots activities of the various Parishad members, and the role of the KSSP as a forum for the scientific publics in Keralam, the digital presence on YouTube can be an effective instrument in the social goals of the KSSP, and for

the movement to grow, through engagement with diverse topics and publics, as well as through consistent reexamination and effort.

Chapter 4

Conclusion

As we saw in the previous chapter, the KSSP has maintained a more or less consistent philosophy, in terms of what science is, what its role in society is, and what the movement's role is in the realms of science and society. The KSSP is a movement with a progressive value system and a vision of social transformation, associated with the advancement of scientific knowledge, and which its diverse groups of members and associates sought to realise through a wide variety of activities.

At this point we can perhaps return to the self-definition of the KSSP, which it formulates through what it is not¹:

1. The Parishad is not a political party, but many of the activities of the Parishad are useful to all political parties to a greater or lesser extent. But the aim of the Parishad is not to become useful to political parties.
2. The Parishad is not a purely welfare organization. Although it works in many sectors like health care, medical camps, construction of low-cost houses, installation of stoves and small scale industries, the aim of the Parishad is not limited to that.

¹<https://kssp.in/what-is-parishad/>

3. The Parishad is not a purely cultural organization. Although it engages in many cultural activities like art shows, public meetings, competitions and processions, the aim of the Parishad is not only that.
4. The Parishad is not a purely educational organization. Although it engages in many formal and informal educational activities like conducting classes for children, teachers and locals, conducting knowledge tests and other competitions, organizing science club and science corner activities, the aim of the Parishad is not only that.
5. The Parishad is not a purely research organization. The aim of the Parishad is not only to engage in research and development activities in various fields such as problems of Kuttanad, indigenous technology, biogas, wealth of Kerala, environmental pollution and environmental protection.
6. The Parishad is not a mere knowledge dissemination organization. The aim of the Parishad is not only to spread the advancements in the fields of science and technology, scientific truths and information useful for people's day-to-day activities.
7. The Parishad is not a publishing house. Although it publishes many scientific books and magazines and is keenly interested in their promotion, this is not the only activity of the Parishad.
8. The Parishad is not a purely rational organization. The Parishad strives to inculcate a scientific outlook on life. But it is not the way of the Parishad to leave the cause and stick to the matter.

Finally, it concludes: "When you know what the Parishad is not, it becomes clear what the Parishad is. When all the good aspects of the above things are incorporated, it becomes Parishad."

This broad definition, in terms of negations is what sets the Parishad apart from being an organisation that is spreading a mechanistic understanding of science, and which creates the possibility for it to engage in a popular, democratic social movement based on scientific understanding.

4.1 Challenges

The majority of people still perceive science as the purview of an elite class, and the extent of success of the efforts of the popular science movement to spread scientific temperament to them has to be examined. The extent to which the marginalised have been included in the movement also has to be examined. While the many popular activities and forums for young people have brought in many people, the question of how many have remained active is another big question.

There is a challenging political climate and anti-science sentiment at the policy level, including statements promoting anti-science thinking and pseudoscience by prominent politicians and public personalities, increasing funding allocated for unscientific research along with very little funding of basic sciences, and violence against rationalists and activists. There is also a challenge to many of the positions of the KSSP from the "post-socialist oligarchic leadership" in the state as well. (Devika, 2023)

There is an impression of scientific progress due to the increasing prevalence of technology and gadgets, and the spread of the internet presents the challenge of misinformation couched in similar language registers as science. Informed and authentic science communication is not be as accessible as misinformation, since the former are not as entertaining and appealing to existing ideas as hoaxes. People widely use scientific jargon to spread unscientific, discriminatory and backward ideas. The struggle exists due simplicity of creating a false claim, appealing to existing biases in society versus the complexity of scientifically proving a claim false. Young people, especially through new media, are also a constituency for spreading unscientific ideas.

On the other hand, there is another phenomenon of young people and new media groups being proponents of scientism, engaging in debates that completely antagonize people on the "other side", which usually includes both people with religious beliefs as well as people who critique science. There can thus be discerned an element of what may be called tribalism on the part of advocates for scientism.

There is also the hypocritical reality of people who engage in debates for science, and advocate science, but then live unscientifically and uncritically.

There needs to be a wider understanding of how our production and use of knowledge are interlinked. Nobody can produce knowledge as an individual, since knowledge is the result of a social process. In the current modes of education and examination, where a large portion of one's time is spend oriented towards entrance examinations, how much a person reaches this kind of a proper understanding of what knowledge is, is questionable, particularly due to the negligence of social sciences in the process. Thus, following in the traditions of the KSSP, at the ground level, in schools, we need to promote practical knowledge processes to inculcate a feeling for and understanding of the process of knowledge production. The current activities in schools are very effective, but needs to reach more people. Science as a methodology and worldview, rather than a result or opinion, needs to be understood by people so that they can examine claims.

There are the emergent challenges such as addressing climate change, and machine learning-based information systems of control which are imbued with the non-democratic and biased value systems of existing power structures(Birhane et al., 2022), where the existing systems globally are stymied. In these scenarios, there is great relevance to a grassroots, local-oriented and people's movement.(Glavovic et al., 2022)

The activities of the KSSP created an atmosphere where a large number of young people were exposed to a variety of scientific ideas. From being primarily through printed materials, textbooks, radio, live events and so on, the points of access to knowledge or information have been diversified, such that there is a possibility of instantaneous access to the most recent scientific development. However, misinformation and disinformation are big problems. As a social movement, the KSSP needs to consistently work on developing new ways of spreading scientific temper and combating these challenges. As an organisation advocating for science and democracy, the KSSP has to account for social factors in the present social

conditions, and how it affects our present understanding of science, development of science and how science becomes effective only when it is democratised.

The idea of transforming Keralam into a "Knowledge Society" or "Knowledge Economy" has been receiving wide publicity. The emerging challenges of complexity and complex crises as well as the existing critiques and exclusions are major challenges. The necessity of reexamining science and democracy and formulating ways forward is a pressing one, and the Kerala Shastra Sahitya Parishad can play a part in creating a pragmatic, democratic, and scientific basis for the way forward, if it can overcome the many contradictions and challenges that are present internally as well externally.

Appendix A

Python Code to obtain all the Uploaded Videos of a YouTube Channel and output it into a tsv file

```
def getYoutubeBuild_API(api_key):
    from googleapiclient.discovery import build
    return build("youtube", "v3", developerKey=api_key)

def getChannelVideos(channelId=None, username=None):
    youtube = getYoutubeBuild_API(API_KEY) # Substitute API key
                                               here

    if channelId:
        res = youtube.channels().list(id=channelId, part="
                                         contentDetails").execute()

    elif username:
        res = youtube.channels().list(forUsername=username, part="
                                         contentDetails").execute()

    else:
        return ["ERROR"]

    playlistId = res["items"][0]["contentDetails"]["
                                         relatedPlaylists"]["uploads"]

    videos = []
    nextPageToken = None

    while True:
        res = (
            youtube.playlistItems()
```

```
.list(
    playlistId=playlistId,
    part="snippet",
    maxResults=50,
    pageToken=nextPageToken,
)
.execute()
)
videos += res["items"]
nextPageToken = res.get("nextPageToken")
if nextPageToken is None:
    break

return videos

if __name__ == "__main__":
    vlist = getChannelVideos("UC1Z7TQ9jXXiX-k3YanWLUUg") # The
                                                    string is the channel ID of
                                                    Science Kerala by KSSP

    for i, v in enumerate(vlist):
        videoId = v['snippet']['resourceId']['videoId']
        vdeets = getVideoDetails(videoId)
        vd[videoId] = {
            'no.': len(vlist) - i,
            'title': v['snippet']['title'],
            'publishedAt': v['snippet']['publishedAt'],
            'URL' : 'https://www.youtube.com/watch?v='+videoId
        }
        vd[videoId]['liveBroadcastContent'] = vdeets['items'][0]['
                                                    snippet']['liveBroadcastContent']
        kl = ['viewCount', 'likeCount', 'favoriteCount', '
                                                    commentCount']

        for k in kl:
            try:
                vd[videoId][k] = vdeets['items'][0]['statistics'][
                    k]
            except KeyError:
```

```
        vd[videoId][k] = None

for v in vd.values():
    if '|' in v['title']:
        v['title'] = v['title'].replace('|', ';')

with open(r"C:\Users\sangeeth\thesis\vlistno.tsv", "w",
          encoding="utf16") as cf:
    fieldnames = ['no.', 'title', 'URL', 'publishedAt', '
                  commentCount', 'favoriteCount', '
                  likeCount', 'viewCount']
    writer = csv.DictWriter(cf, fieldnames=fieldnames,
                            delimiter='\t')

    writer.writeheader()
    for v in reversed(list(vd.keys())):
        writer.writerow(vd[v])
```


Bibliography

- About, Paschim Banga Vigyan Mancha.* (n.d.). Retrieved April 1, 2023, from <https://paschimbangavigyanmancha.org/about.php>
- Anandan, S. (2023). A long march for Kerala and science [newspaper]. *The Hindu: Kerala.* Retrieved March 3, 2023, from <https://www.thehindu.com/news/national/kerala/a-long-march-for-kerala-and-science/article66544636.ece>
- Arya U.R. (2019). Kerala(m)? [newspaper]. *The Times of India.* Retrieved March 30, 2023, from <https://timesofindia.indiatimes.com/city/kochi/keralam/articleshow/67915744.cms>
- Beck, U. (1992). *Risk Society: Towards a New Modernity* (Vol. 17). SAGE.
- Becker, A. (2018). *What is real? the unfinished quest for the meaning of quantum physics* (First edition). Basic Books.
- Bernal, J. (1954). *Science in History.* Cameron Associates. Retrieved April 1, 2023, from <http://archive.org/details/B-001-002-183>
- Bernal, J. D. (1939). *The social function of science.* London: George Routledge & Sons Ltd.
- Birhane, A., Kalluri, P., Card, D., Agnew, W., Dotan, R., & Bao, M. (2022). The Values Encoded in Machine Learning Research. *2022 ACM Conference on Fairness, Accountability, and Transparency*, 173–184. <https://doi.org/10.1145/3531146.3533083>
- Chathukulam, J., & Tharamangalam, J. (2021). The Kerala model in the time of COVID19: Rethinking state, society and democracy. *World Development*, 137, 105207. <https://doi.org/10.1016/j.worlddev.2020.105207>

- Devika, J. (2008, March 30). *Individuals, Householders, Citizens: Family Planning in Kerala*. Zubaan Books.
- Devika, J. (2010). Egalitarian Developmentalism, Communist Mobilization, and the Question of Caste in Kerala State, India. *The Journal of Asian Studies*, 69(3), 799–820. <https://doi.org/10.1017/S0021911810001506>
- Devika, J. (2023, February 27). *Rewriting Biopolitics? The Kerala Sastra Sahitya Parishat and the Left*. KAFILA - COLLECTIVE EXPLORATIONS SINCE 2006. Retrieved March 3, 2023, from <https://kafila.online/2023/02/27/rewriting-biopolitics-the-kerala-sastra-sahitya-parishat-and-the-left/>
- Drèze, J., & Sen, A. (2013). *An uncertain glory: India and its contradictions*. Princeton University Press
OCLC: ocn846540422.
- D'Souza, R. V. (2020). India's Emerging Ecological Public and the Western Ghats: The Gadgil Committee Report and the Responses of Contiguous States. In W. Leal Filho, U. Tortato, & F. Frankenberger (Eds.), *Universities and Sustainable Communities: Meeting the Goals of the Agenda 2030* (pp. 417–430). Springer International Publishing. https://doi.org/10.1007/978-3-030-30306-8_25
- Elias, A. A. (2021). Kerala's Innovations and Flexibility for Covid-19 Recovery: Storytelling using Systems Thinking. *Global Journal of Flexible Systems Management*, 22(1), 33–43. <https://doi.org/10.1007/s40171-021-00268-8>
- Escobar, A. (1992). Reflections on 'development': Grassroots approaches and alternative politics in the Third World. *Futures*, 24(5), 411–436. [https://doi.org/10.1016/0016-3287\(92\)90014-7](https://doi.org/10.1016/0016-3287(92)90014-7)
- Funtowicz, S., & Ravetz, J. (2018). Post-normal science. In *Companion to Environmental Studies*. Routledge.
- Glavovic, B. C., Smith, T. F., & White, I. (2022). The tragedy of climate change science. *Climate and Development*, 14(9), 829–833. <https://doi.org/10.1080/17565529.2021.2008855>

- Habermas, J., Lennox, S., & Lennox, F. (1974). The Public Sphere: An Encyclopedia Article (1964). *New German Critique*, (3), 49–55. <https://doi.org/10.2307/487737>
- Harding, S. (1992). Rethinking Standpoint Epistemology: What is strong Objectivity? *The Centennial Review*, 36(3), 437–470. Retrieved November 21, 2021, from <https://www.jstor.org/stable/23739232>
- Harding, S. (1998). *Is science multicultural?: Postcolonialisms, feminisms, and epistemologies*. Indiana University Press.
- Higher cases, low CFR: Kerala's Covid numbers in 5 charts [newspaper]. (2021). *The Times of India*. Retrieved March 30, 2023, from <https://timesofindia.indiatimes.com/india/in-5-charts-why-kerala-is-an-outlier-in-indias-covid-fight/articleshow/84070092.cms>
- Hill, P. (1986). Kerala is Different. *Modern Asian Studies*, 20(4), 779–792. <https://doi.org/10.1017/S0026749X0001372X>
- Isaac, T. M., & Ekbal, B. (1988). Science for social revolution: Experience of the Kerala Sastra Sahitya Parishad. *Peoples Science Congress. Cannanore, Kerala*, 11–12.
- Isaac, T. M. T., Franke, R. W., & Parameswaran, M. P. (1997). From anti-feudalism to sustainable development: The Kerala Peoples Science Movement. *Bulletin of Concerned Asian Scholars*, 29(3), 34–44. <https://doi.org/10.1080/14672715.1997.10413092>
- Jacob, J. (n.d.). Kerala backs out of Sprinklr deal, cancels controversial pact over privacy issues [newspaper]. *India Today*. Retrieved March 30, 2023, from <https://www.indiatoday.in/india/story/kerala-sprinklr-deal-covid-19-pinarayi-vijayan-high-court-1680484-2020-05-21>
- Jasanoff, S. (1998, August 19). *The Fifth Branch: Science Advisers as Policymakers*. Harvard University Press.
- Jasanoff, S. (2004). *States of Knowledge: The Co-Production of Science and Social Order*. Routledge Taylor & Francis Group.
- Jasanoff, S. S. (1987). Contested Boundaries in Policy-Relevant Science. *Social Studies of Science*, 17(2), 195–230. <https://doi.org/10.1177/030631287017002001>

- Jayanth, A. S. (2019). A CAPSULE to fight quacks in Kerala [newspaper]. *The Hindu: Kerala*. Retrieved April 1, 2023, from <https://www.thehindu.com/news/national/kerala/a-capsule-to-fight-quacks-in-kerala/article27845077.ece>
- Jayanth, A. S. (2020). Pandemic hits unorganised sector hard [newspaper]. *The Hindu: Kozhikode*. Retrieved April 1, 2023, from <https://www.thehindu.com/news/cities/kozhikode/pandemic-hits-unorganised-sector-hard/article31527984.ece>
- Jeffrey, R. (1992). *Politics, Women and Well-Being*. Palgrave Macmillan UK. <https://doi.org/10.1007/978-1-349-12252-3>
- John, R. M. (n.d.). *Why Is Kerala Reporting So Many More COVID-19 Cases Than Other Indian States?* The Wire. Retrieved March 30, 2023, from <https://thewire.in/health/why-kerala-report-more-covid-19-cases>
- Kannan, K. P. (2023). Revisiting the Kerala ‘Model’ of Development: A Sixty-year Assessment of Successes and Failures. *The Indian Economic Journal*, 71(1), 120–151. <https://doi.org/10.1177/00194662221145290>
- Kerala Sasthra Sahitya Parishad. (2017, August). *Kerala Padanam*. Retrieved March 25, 2023, from <http://archive.org/details/kerala-padanam-kssp>
- Kuhn, T. S., & Hacking, I. (2012, April 30). *The Structure of Scientific Revolutions: 50th Anniversary Edition* (Fourth edition). University of Chicago Press.
- Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Harvard university press.
- Mahanti, S. (2018). Nehru’s Vision of Scientific Temper. *Journal of Scientific Temper (JST)*, 4(3 & 4). <https://doi.org/10.56042/jst.v4i3>
- Mannathukkaren, N. (2023). ‘Enjoying life’: Consumption, changing meanings, and social differentiation in Kerala, India. *Modern Asian Studies*, 1–50. <https://doi.org/10.1017/S0026749X22000257>
- Merton, R. K. (1973). *The sociology of science: Theoretical and empirical investigations*. University of Chicago press.

- Miller, C. A. (2008). Civic Epistemologies: Constituting Knowledge and Order in Political Communities. *Sociology Compass*, 2(6), 1896–1919. <https://doi.org/10.1111/j.1751-9020.2008.00175.x>
- Mohan, K. T. R. (1991). Understanding Keralam: The tragedy of radical scholarship. *Monthly Review*, 43(7), 18–32. Retrieved March 30, 2023, from <https://go.gale.com/ps/i.do?p=AONE&sw=w&issn=00270520&v=2.1&it=r&id=GALE%7CA11685859&sid=googleScholar&linkaccess=abs>
- Nanda, M. (1997). The Science Wars in India [magazine]. *Dissent Magazine*. Retrieved April 1, 2023, from <https://www.dissentmagazine.org/article/the-science-wars-in-india-2>
- Nanda, M. (2006). *Prophets facing backward: Postmodernism, science, and Hindu nationalism*. Permanent Black
OCLC: 1027324338.
- Oommen, M. A. (2018). Kerala is no model of development [newspaper]. *Opinion*. Retrieved March 14, 2023, from <https://www.thehindubusinessline.com/opinion/kerala-is-no-model-of-development/article21912158.ece1>
- Opposition corners Kerala government on KSSP report [newspaper]. (2021). *The Times of India*. Retrieved April 2, 2023, from <https://timesofindia.indiatimes.com/city/kochi/opposition-corners-kerala-government-on-kssp-report/articleshow/83222783.cms>
- Padma, T. V. (2018). Mining and dams exacerbated devastating Kerala floods. *Nature*, 561(7721), 13–15. Retrieved March 30, 2023, from <https://go.gale.com/ps/i.do?p=AONE&sw=w&issn=00280836&v=2.1&it=r&id=GALE%7CA572888942&sid=googleScholar&linkaccess=abs>
- Papadamou, K., Zannettou, S., Blackburn, J., Cristofaro, E. D., Stringhini, G., & Sirivianos, M. (2022). “It Is Just a Flu”: Assessing the Effect of Watch History on YouTube’s Pseudoscientific Video Recommendations. *Proceedings of the International AAAI Conference on Web and Social Media*, 16, 723–734. <https://doi.org/10.1609/icwsm.v16i1.19329>

- Parayil, G. (1996). The 'Kerala model' of development: Development and sustainability in the Third World. *Third World Quarterly*, 17(5), 941–958. <https://doi.org/10.1080/01436599615191>
- Price, D. J. D. S. (1963). *Little Science, Big Science*. Columbia University Press.
- Rahim, A. A., Chacko, T. V., & Rajan, S. (2020). Responding to COVID-19: Lessons from Kerala on what worked under resource constraint settings and a glimpse into the surgical management of patients. *IJS Global Health*, 3(6), e31. <https://doi.org/10.1097/GH9.0000000000000031>
- Rajan, S. I., & Zachariah, K. C. (2020). New Evidences from the Kerala Migration Survey, 2018. 55(4). Retrieved March 29, 2023, from <https://www.epw.in/journal/2020/4/special-articles/new-evidences-kerala-migration-survey-2018.html>
- Raman, K. R. (2009). Asian Development Bank, policy conditionalities and the social democratic governance: Kerala Model under pressure? *Review of International Political Economy*, 16(2), 284–308. <https://doi.org/10.1080/09692290802454620>
- Raman, K. R. (2010a). The Kerala Model: Situating the critique. In *Development, Democracy and the State*. Routledge.
- Raman, K. R. (Ed.). (2010b, April 14). *Development, Democracy and the State: Critiquing the Kerala Model of Development*. Routledge. <https://doi.org/10.4324/9780203856437>
- Ravi Raman, K. (Ed.). (2010). *Development, democracy and the state: Critiquing the Kerala model of development*. Routledge
OCLC: ocn311756511.
- Smolin, L. (2007). *The trouble with physics: The rise of string theory, the fall of a science, and what comes next*. HMH.
- The Hindu. (2019). Should Kerala become Keralam? [newspaper]. *The Hindu: Kerala*. Retrieved March 30, 2023, from <https://www.thehindu.com/news/national/kerala/kerala-or-keralam/article30030540.ece>
- The Hindu. (2020a). Closed spaces promote virus spread, finds study [newspaper]. *The Hindu: Kerala*. Retrieved March 31, 2023, from <https://www.thehindu.com/news/national/kerala/kerala-or-keralam/article30030540.ece>

com/news/national/kerala/closed-spaces-promote-virus-spread-finds-study/article32368007.ece

The Hindu. (2020b). Make digital classes more student-friendly, says KSSP [newspaper]. *The Hindu: Thiruvananthapuram*. Retrieved March 31, 2023, from <https://www.thehindu.com/news/cities/Thiruvananthapuram/make-digital-classes-more-student-friendly-says-kssp/article32817325.ece>

The Hindu. (2021). 25% in Thiruvananthapuram not using masks properly: Survey [newspaper]. *The Hindu: Kerala*. Retrieved April 1, 2023, from <https://www.thehindu.com/news/national/kerala/25-in-capital-not-using-masks-survey/article33512569.ece>

The New Indian Express. (n.d.). Activists flay Kerala government's move to give homoeopathy drug to children [newspaper]. *The New Indian Express*. Retrieved April 1, 2023, from <https://www.newindianexpress.com/cities/thiruvananthapuram/2021/oct/05/activists-flay-kerala-governments-move-to-give-homoeopathydrug-to-children-2367650.html>

The New Indian Express. (2021). Health activists raise doubts over allergy testing camps [newspaper]. *The New Indian Express*. Retrieved April 1, 2023, from <https://www.newindianexpress.com/cities/thiruvananthapuram/2021/oct/01/health-activists-raise-doubts-over-allergy-testing-camps-2366037.html>

Thomas, A. M. (2020, June 29). *Revisiting the Economic Thought of K. N. Raj*. ALA. Retrieved March 29, 2023, from <https://alablog.in/issues/22/k-n-raj-thought/>

Unnikrishnan, S. (2022). 'Magical cures' thrive in Kerala despite rigorous laws [newspaper]. *The New Indian Express*. Retrieved April 1, 2023, from <https://www.newindianexpress.com/states/kerala/2022/oct/13/magical-cures-thrive-in-kerala-despite-rigorous-laws-2507514.html>

Varma, R. (2001). People's Science Movements and Science Wars? *Economic and Political Weekly*, 36(52), 4796–4802. Retrieved April 1, 2023, from <https://www.jstor.org/stable/4411529>

- Varughese, S. S. (2012). Where are the Missing Masses? The Quasi-Publics and Non-Publics of Technoscience. *Minerva*, 50(2), 239–254. <https://doi.org/10.1007/s11024-012-9197-3>
- Varughese, S. S. (2017a). *Contested Knowledge: Science, Media, and Democracy in Kerala*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199469123.001.0001>
- Varughese, S. S. (2017b, February 23). Conclusion: Science, Media, and the Question of Democracy. In S. S. Varughese (Ed.), *Contested Knowledge: Science, Media, and Democracy in Kerala* (p. 0). Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199469123.003.0008>
- Varughese, S. S. (2017c, February 23). Introduction. In S. S. Varughese (Ed.), *Contested Knowledge: Science, Media, and Democracy in Kerala* (p. 0). Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199469123.003.0001>
- Varughese, S. S. (2017d, February 23). Science, Media, Risk Politics: Constructing a Scientific Public Sphere. In S. S. Varughese (Ed.), *Contested Knowledge: Science, Media, and Democracy in Kerala* (p. 0). Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199469123.003.0002>
- Viswanath, C. (2020, October 16). *So What Really Went Wrong With the Kerala Model of Combatting Covid-19?* News18. Retrieved March 30, 2023, from <https://www.news18.com/news/india/so-what-really-went-wrong-with-the-kerala-model-of-combatting-covid-19-2970632.html>
- Waltner-Toews, D., Biggeri, A., De Marchi, B., Funtowicz, S., Giampietro, M., O'Connor, M., Ravetz, J., Saltelli, A., & Sluijs, J. (2020, April 7). *Post-normal Pandemics: Why Covid-19 requires a New Approach to Science*.
- Welbourne, D. J., & Grant, W. J. (2016). Science communication on YouTube: Factors that affect channel and video popularity. *Public Understanding of Science*, 25(6), 706–718. <https://doi.org/10.1177/0963662515572068>
- Yadav, A., Phillips, M. M., Lundeberg, M. A., Koehler, M. J., Hilden, K., & Dirkin, K. H. (2011). If a picture is worth a thousand words is video worth a million? Differences in affective and cognitive processing of video and

- text cases. *Journal of Computing in Higher Education*, 23(1), 15–37. <https://doi.org/10.1007/s12528-011-9042-y>
- Yang, S., Brossard, D., Scheufele, D. A., & Xenos, M. A. (2022). The science of YouTube: What factors influence user engagement with online science videos? *PLOS ONE*, 17(5), e0267697. <https://doi.org/10.1371/journal.pone.0267697>
- Zachariah, M., & Sooryamoorthy, R. (1994). *Science for Social Revolution? : Achievements and Dilemmas of a Development Movement - The Kerala Shastra Sahitya Parishad*. Vistaar Publications.

Turnitin Originality Report

Processed on: 08-Apr-2023 14:05 IST

ID: 2058935403

Word Count: 27205

Submitted: 1

Dissertation By Sangeeth Saji Varma *

Similarity Index

6%

Similarity by Source

Internet Sources: 6%

Publications: 3%

Student Papers: 2%

1% match (Internet from 03-Feb-2023)

https://wiki.kssp.in/images/5/58/Matter_science.pdf

< 1% match (Internet from 18-Nov-2022)

<https://www.news18.com/news/india/so-what-really-went-wrong-with-the-kerala-model-of-combatting-covid-19-2970632.html>

< 1% match (Internet from 13-May-2008)

http://en.wikipedia.org/wiki/Kerala_sasthra_sahitya_parishat

< 1% match (Internet from 31-Mar-2009)

http://en.wikipedia.org/wiki/Kerala_Sasthra_Sahithya_Parishad

< 1% match (Internet from 12-Feb-2020)

https://en.wikipedia.org/wiki/Kerala_Sasthra_Sahithya_Parishad

< 1% match (student papers from 16-Dec-2021)

Class: Others

Assignment: Paper

Paper ID: [1731938633](#)

< 1% match (student papers from 14-Mar-2018)

[Submitted to Tata Institute of Social Sciences on 2018-03-14](#)

< 1% match (student papers from 28-Jan-2023)

Class: MA2020-2022 Repository

Assignment: Thesis

Paper ID: [2001076558](#)

< 1% match (Rosamond Faith. "Poverty, a history", Journal of Rural Studies, 1996)

[Rosamond Faith. "Poverty, a history", Journal of Rural Studies, 1996](#)

< 1% match (student papers from 17-Nov-2016)

[Submitted to Cork Institute of Technology on 2016-11-17](#)

< 1% match (student papers from 07-Oct-2021)

[Submitted to University of Sydney on 2021-10-07](#)

< 1% match (Internet from 22-Aug-2022)

https://www.cdc.gov/library/docs/covid19/ONLY_New_Articles_25Sept2020_Excel.xlsx

< 1% match (Internet from 07-Jan-2020)

<https://philpapers.org/s/technoscience>

< 1% match (Internet from 01-Feb-2023)

https://www.researchgate.net/publication/340861478_Pandemie_post-normali_Perche_CoViD-19_richiede_un_nuovo_approccio_alla_scienza

< 1% match (Internet from 28-Jan-2023)

https://www.researchgate.net/publication/222561060_The_New_Kerala_Model_Lessons_for_Sustainable_Developme

< 1% match (Shiju Sam Varughese. "Where are the Missing Masses? The Quasi-Publics and Non-Publics of Technoscience", Minerva, 2012)