# ENVIRONMENTAL RESEARCH
## CLIMATE

# Climate change: the missing discourse in the Indian Parliament

1  **Climate change: The missing discourse in the Indian Parliament**

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22 **Abstract**

23 Parliamentary Questions (PQs) are a crucial oversight tool available to

24 parliamentarians in all democracies. In a well-functioning democracy, parliamentary

25 oversight can play an important role in climate change policy, ensuring that climate

26 concerns are represented in national agendas. India is the largest democracy in the

27 world and one of the countries most vulnerable to climate change. Over a twenty-year

28 period, from 1999-2019, we examine whether parliamentarians used PQs to address

29 climate change issues in India. We asked four questions 1) how often are PQs raised

30 about climate change? 2) are vulnerable constituency interests being represented in

31 the Parliament? 3) what kinds of questions do parliamentarians ask?  and 4) where

32 do parliamentarians get their information on climate change from? 895 unique PQs

33 related to climate change were raised by 1019 Ministers, forming only a fraction

34 (~0.3%) of the total PQs asked in parliament during this period, however the number

35 of PQs related to climate change increased over time. PQs were not raised by the

36 states most vulnerable to climate change, nor did they represent the concerns of

37 socially vulnerable groups. The PQs were mostly concerned about the impacts

38 (27.6%) and mitigation (23.4%) of climate change. Impacts on agriculture (38.3%),

39 coastal changes (28.6 %), and health (13.4%) were of main interest, along with

40 mitigation issues related to energy (43.6%), agriculture (21.8%), and aviation (9.1%).

41 Despite the significant and growing vulnerability of India to climate change, PQs

42 related to climate change were largely missing. Although they have increased over

43 time, we still find there is substantial room for growth, especially in critical areas of

44 climate justice and adaptation that are especially relevant to the Indian context.

45 Raising the level of parliamentary debate on climate change is critical and needs to

46 be foregrounded.

2

47 **Keywords:** Democracy, Oversight tool, Parliamentary Questions, Climate

48 Vulnerability, Climate impact, Climate mitigation, Climate adaptation

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**Introduction**

51 The climate crisis is one of the biggest challenges facing the earth today, with

52 catastrophic potential impacts on human and natural systems (IPCC 2021).

53 Addressing this challenge requires multi-level governance especially at global,

54 national, sub-national and regional levels. At the global level, climate agreements and

55 treaties negotiate terms for countries to curb emissions (for example, The United

56 Nations Framework Convention on Climate Change (UNFCCC) 1992, Kyoto Protocol

57 1997, Paris Agreement 2015). While the efficacy of these treaties and agreements in

58 reducing global emissions are contested, they have been important in keeping climate

59 change issues on the global policy agenda (Kinley et al. 2021). Equally important is

60 the national level of governance, where the role of the government includes functions,

61 such as creating national climate frameworks, national laws, policies, setting

62 standards for key climate-related sectors, and providing regional funding and support

63 (Eskander and Frankhauser 2020). While the nature of climate change mitigation is

64 predominantly global, impacts are primarily felt at a local scale, and adaptation is often

65 primarily local (Di Gregorio et al. 2019). This makes it imperative for regional and local

66 representation to play a role in the making of climate policies.

67 44.9% of the world's countries, comprising 49.4% of the world's population, live in

68 democracies, whether full or flawed (Economist Intelligence Unit 2020).

69 Understanding if local and regional nuances of climate change find voice in a

70 parliamentary democracy is an especially important question for contemporary climate

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71    policy. The Parliament is considered the central institution of democracy and

72    embodies the will of the people and carries out all their expectations (Holmberg et. al.

73    2017). It is a legislative organ whose job is to scrutinize the actions of the government

74    (Leston-Bandiera and Thompson 2018). A functioning Parliament can ensure

75    oversight of the representation of relevant climate issues in national government policy

76    and agenda (Fitsilis and De Vrieze 2020). The job of the Parliament to hold the

77    government accountable to its citizens is performed through oversight tools (Pelizzo

78    and Stapenhurst 2013, Bundi 2017). A critical oversight tool is the use of Parliamentary

79    Questions (PQ), which exists in all parliamentary democracies (Russo and Wiberg

80    2010). PQs are a crucial instrument for parliamentarians to voice their concerns and

81    represent electoral interests, demand information from the government, and prepare

82    legislative acts (Bailer 2011, Martin 2011). PQs can be used as a metric for the

83    government to gauge public mood and adapt policies and actions accordingly (Sen et.

84    al. 2019). As such, PQs have been used to explore the relationship between media

85    coverage and the Parliament (Datta 2008, Van Santen 2015), parliamentarian

86    concerns related to gender (Bird 2005), tobacco (Varma 2021), crime and

87    unemployment (Borghetto et al. 2020), and issues related to science and technology

88    (Haritash and Gupta 2002).

89    India is considered the largest democracy in the world and faces some of the highest

90    climate and disaster risk levels in the world, ranked 29 out of 191 countries (Inform

91    Report 2019). India is particularly vulnerable to climate change due to the geographic

92    size of the country, its diverse climatic conditions, and its large population (Dubash

93    2012; Mehta et al. 2019 ). Further, different sections of society are likely to be impacted

94    differently based on factors such as economic status, social status, gender, and

95    location (Islam and Winkel 2017).

*1.1 India and Climate Change*

India adopted the "National Action Plan on Climate Change" in 2008. Considered the country's flagship climate change legislation, it outlines policies and initiatives directed at mitigation, adaptation, and energy efficiency (Chandel et.al. 2016). Specific missions have also been created to target sectors vulnerable to climate change. India has also established State Action Plans on Climate Change, where each state is expected to tailor an action plan based on its sense of vulnerabilities and opportunities (Jogesh and Paul 2020). Despite state-specific plans, action on climate change at the state level is guided by a strong top-down approach that takes its cues from the central government (Bhardwaj and Khosla 2020). Monitoring climate action in different states and union territories, each with their own unique vulnerabilities is difficult for the centre and there may arise situations where pressing issues do not receive the attention they require (Jogesh and Dubash 2015).

*1.2 Structure of the Indian Parliament*

The Indian Parliament is bicameral in nature, with two houses of representatives—the Lok Sabha (House of the People), which consists of representatives elected directly by the people and the Rajya Sabha (House of the State), whose representatives are elected indirectly (Hewitt and Rai 2010). Though the word is not used explicitly in the Constitution, India has a federal structure of government in which the central government constitutes the highest authority in the country and state governments operate in the periphery, governing the states in the country (Jayal 2007). India consists of 28 states and 8 union territories. State governments govern states, while the centre directly governs union territories. The Constitution describes a clear division of powers between the centre and state (dual polity), in terms of legislative,

120 administrative and financial functions and both the centre and state operate supreme,

121 in their respective spheres of governance (Tillin 2019).

*1.3 The PQs in India*

123 PQs are asked every morning, during the first hour, when the parliament is in session

124 (Datta 2008). During this period, Members of Parliament (MP) from different political

125 parties raise questions on all matters relating to administration and government

126 activity, which the government answers through its ministers. In addition to providing

127 a satisfactory answer to questions posed, ministries are also compelled to take into

128 consideration the inputs of MPs into the law-making process, failing which, they could

129 potentially lose the confidence of the house (Datta 2008). In this manner, oversight

130 guarantees that the government is held accountable.

*1.4 Research Questions*

132 In this study we raised four questions about the role of PQs in India with regard to

133 climate change:

134    1)  How often are PQs raised about climate change?

135    2)  Are vulnerable constituency interests being represented in the Parliament? For

136         this question we specifically tested two hypotheses a) MPs from vulnerable

137         states ask more PQs and b) women MPs ask more PQs as women constituents

138         are more vulnerable to climate impacts.

139    3)  What kinds of questions do parliamentarians ask?

140    4)  And finally, a question of increasing policy relevance for academics - where do

141         parliamentarians get their information on climate change from?

142

**2. Methods**

*2.1 Data collation*

We collated a comprehensive list of PQs related to climate change, asked in the Lok Sabha from 1999-2019, using the Parliamentary Questions Data Portal, a repository of PQs from the same period. The Parliamentary Questions Data Portal is a project of the Trivedi Centre for Political Data, led by faculty members from the Ashoka University (Trivedi Centre for Political Data 2021). The dataset which is completely open source is an extremely useful tool to access questions asked in the Lok Sabha, as the data has been cleaned and additional information on the Minister's asking the questions provided. The search tool makes it easy to filter questions based on the area of interest.

PQs were filtered from the database using specific keywords. A long list of 30 keywords related to climate change were initially tested (Adaptation, Carbon, Climate, Disaster, Drought, Extreme, Extreme Event, Forest, Fossil Fuels, Greenhouse, Green power, Heat, Kyoto, Kyoto Protocol, IPCC, REDD, Renewables, Sustainable, Sustainable Development, Vulnerability, Warm, Weather, Mitigation, Environment, Deforestation, Biodiversity, Pollution, Epidemic, Methane, and Nitrous Oxide). Each keyword was tested individually, and the PQs checked manually for relevant results, i.e PQs that related to climate change such as impacts, mitigation, action, seeking more information, etc.. The long-list of keywords was initially created based on what we thought we the most common terms associated with climate change. The long-list was further modified based on the common words that appeared in the PQs about climate change. Through this process, the final short list of keywords was created. Eight keywords were found to yield the most relevant search results – "Climate", "Adapt", "Carbon", "Fossil fuel", "Green power", "IPCC", "Kyoto" and "Warm". A total of

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168　1,421 PQs were initially obtained. The PQs were then manually checked for relevance,

169　and those not related to climate change or duplicates were removed. The state

170　"Telangana" was excluded from the analysis as it is a newly created state, which was

171　separated from the state Andhra Pradesh in 2014. There were only 4 PQs put forth by

172　MPs from Telangana during the study period.　The final dataset had 895 questions.

173　The PQs were sorted chronologically (based on the date the PQ was asked). For each

174　PQ, the following additional information was also collected: search term, date, PQ,

175　answer to the PQ, ministry, name of MP, gender of MP, political party, state of MP and

176　constituency of MP.

177　*2.2 Data Analysis*

178　Mixed methods (qualitative and quantitative) were used for the analysis. We first

179　describe the quantitative analysis used to answer research questions 1 and 2, and

180　then describe the qualitative analysis for research questions 3 and 4.

181　*2.2.1 Quantitative Analysis*

182　To analyze how frequently PQs were raised in parliament, the number of PQs were

183　plotted against the year.

184　For the second research question, the two hypotheses were tested using generalized

185　linear model (GLM): a) MPs from vulnerable states ask more PQs and b) women MPs

186　ask more PQs as women constituents are more vulnerable to climate impacts. The

187　response variable was the number of PQs asked by MPs in parliament, and the

188　explanatory variables were the year the PQ was asked, gender of the MP, climate

189　vulnerability of the state, and the number of sitting MPs from each state. The data was

190　first sorted, cleaned, and then the model was run.

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191 For this analysis, each MP was treated as a single unit of analysis. In some cases,

192 multiple MPs asked the same PQ. In such cases, for our analysis, each MP was treated

193 independently. The number of questions asked by one MP in one year was aggregated.

194 For example, if an MP asked 5 PQs in 2000, the number of PQs asked was 5. The name

195 of the MP, gender, state, and constituency was obtained from Parliamentary

196 Questions Data Portal. In 9 instances, either the state or the gender of the MP was

197 not provided in the database. We removed these entries.

198 To determine if climate vulnerable groups had representation in parliament, we

199 explored how many PQs were asked based on the background of the MP. Class,

200 caste, and indigenous status of the MP were difficult to obtain, so we restricted this to

201 the gender of the MP.

202 The climate vulnerability for each state was obtained from Dasgupta et al. 2020 where

203 relative climate vulnerabilities of the states were assessed through an integrated

204 vulnerability assessment (based on biophysical, socio-economic, and institution and

205 infrastructure-related vulnerability indicators). Vulnerability was conceptualized based

206 on the IPCC-AR5 framework. Climate vulnerability for the union territories was not

207 available. We removed the MP's from union territories who asked questions (17

208 entries). The final database had 1019 entries after cleaning.

209 The explanatory variables (the year the PQ was asked, climate vulnerability of the

210 state, and the number of sitting MPs from each state) were scaled before running the

211 models. Table 1 provides details of the variables used in the model. We were unable

212 to obtain information on the MPs who did not ask questions (that is 0 data) as the

213 database did not include this information. Therefore, the models were only run on the

214 MPs who asked questions.

215 We used GLMs with a negative binomial distribution due to overdispersion of data (Ver

216 Hoef and Boveng 2007) to determine the influence of state climate vulnerability,

217 gender of the MP, sitting members of parliament in each state, and the year on the

218 number of PQs asked by MPs in Parliament.

219 No interaction was envisioned between the terms. Model selection was undertaken

220 by calculating the Akaike Information Criteria (AIC) (Crawley 2007). All data were

221 analyzed in the statistical software R (R Development Core Team 2022)

222

223 *2.2.2 Qualitative Analysis*

224 For research questions 3 and 4, the analysis was conducted at the level of the PQs.

225 There were a total of 895 PQs. The PQs were qualitatively analysed using Inductive

226 Content Analysis. Each PQ was treated as a single unit of analysis and was

227 manually coded as follows: "Sector", "Source", "Climate Change Aspect", "Location",

228 and "Social Vulnerability".  The definitions and categories of codes used specifically

229 in this paper are provided in Table 2. To check for inter-coder reliability, Kappa

230 scores were calculated for each category. ZJ was the primary coder, and RM and

231 SM were the secondary coders. The secondary coder coded for 50 questions. Kappa

232 scores ranged from 0.80 to 0.95, with a mean of 0.89. These scores indicate there

233 was 64% to 84% agreement, which is considered strong (McHugh 2012).

234 **3. Results**

235 3.1. *How often are PQs raised about climate change?*

236   A total of 895 unique PQs related to climate change were asked between 1999-2020.

237   This is only a very small percentage (~0.3%) of the total number of PQs asked during

238   the study period. Overall, we found a trend towards more questions on climate change

239   over time, though with some ups and downs. The highest number of questions (104

240   questions) were asked in 2015. The largest spike in questions was in 2007, where the

241   number of PQs jumped from eight asked in 2006 to 53 asked in 2007 (Figure 1).

242

243   *3.2. Are vulnerable constituency interests being represented in the Parliament?*

244   MPs from 26 states and 5 union territories raised PQs in the study period. In total,

245   1019 MPs asked PQs (in some cases multiple MPs raised the same PQs). MPs that

246   asked the most PQs were from Maharashtra (181), Andhra Pradesh (105), Tamil Nadu

247   (99), Uttar Pradesh (98), and Kerala (69), and the MPs from states that asked the least

248   questions were Mizoram (0), Manipur, Meghalaya, and Punjab (2 each). A total of 92

249   women MPs asked 117 PQs and 927 men MPs asked 1245 PQs.

250   No relationship was observed between climate vulnerability of the states (coefficient =

251   -0.01, p = 0.7, n=1018), gender of the MP (coefficient = 0.05, p = 0.6, n=1018), and

252   sitting MPs in Parliament (coefficient = -0.02, p = 0.5, n=1018). Infact, the null model

253   (questions ~ 1), was the best performing model (AIC = 2101.91). This indicates that

254   none of the explanatory variables in the global model were able to explain the

255   variation.

256

257   Based on this, we reject both the hypotheses which are a) MPs from vulnerable states

258   ask more questions and b) women MPs ask more questions.

259

*3.3 What kinds of questions do parliamentarians ask?*

261  635 or 71% of the PQs could be coded with a 'climate change aspect', i.e. they

262  provided enough information for us to categorize them into groups, depending on

263  whether the PQ focused on impacts, mitigation, or adaptation aspects of climate

264  change. Impacts of climate change were mentioned the most (27.6%), followed by

265  mitigation (23.5%). In contrast adaptation received very little attention, being

266  mentioned in just 3.9% of the PQs (Table 3).

267  The PQs were most concerned about the impacts of climate change on agriculture

268  (38.3%), coastal changes (28.6 %), and health (13.4%) (Table 4). Questions on

269  agriculture were largely focused on specific crops. Coastal sector impacts were a

270  concern as early as 2007 and persisted into 2018.

271  The impacts of climate change on the socially or economically vulnerable were

272  represented in 0.007% of the PQs (6 PQs). Of these, one PQ asked about the impact

273  of climate change on women, one asked about the impact of climate change on

274  indigenous communities, and four PQs on the economically disadvantaged in the

275  country (two PQs of the impacts of climate change, one PQ on adaptation, and one

276  PQ on the potential unequal distribution of adaptation measures). There were no

277  questions related to differential impacts based on caste.

278  PQs related to mitigation focused most on energy (43.6%), followed by agriculture

279  (21.8%), and aviation (9.1%), seeking to understand how carbon emissions could be

280  reduced, and the use of new technologies to reduce emissions.

281  Adaptation, asked in only 21 PQs, focused primarily on agriculture (14 PQS), followed

282  by energy, coastal areas, water, and industry (1 PQ each). Adaptation PQs on

283 agriculture ranged from the use of climate resilient technologies to the need to create

284 awareness among farmers, and specific funds set up for adaptation.

285 The questions also asked for details on measures taken by the government for

286 adaptation in terms investment in green technology, or commitments to through

287 different schemes and funds, sometimes focusing on certain geographically

288 vulnerable areas such as the hilly North-East of India.

289 *3.4 Where do parliamentarians get their information from?*

290 Ministers referred to a source for their information on climate change in only 10%, i.e.

291 91 questions of the PQs asked (Table 3). Studies (60%) were the most cited sources.

292 The most mentioned reports were from IPCC (n=8), the United Nations (n=5) and the

293 World Bank (n=4). The reports referenced included those by academic institutions as

294 well as by civil society organizations, and covered issues of global warming,

295 greenhouse gas emissions and agriculture, as well as health and disease spread,

296 dangers to glaciers, forest cover, and impact on heritage monuments.

297 Newspaper articles (22%) were the next most cited sources. The Times of India (8

298 PQs), The Hindustan Times (4 PQs) and The Hindu (3 PQs) were the newspapers

299 that were quoted the most times in the PQs. The most cited articles were those that

300 reported on an event like a seminar organized or a report release, or drew from a

301 headline in the newspaper. Other quoted sources include specific institutes as sources

302 (5 PQs). One PQ drew on an international agreement. Institutions cited as sources

303 included national institutions such as the National Agricultural Research Institute and

304 global institutions such as the Global Forest Resource Association.

305

306 **4. Discussion**

307   This study largely highlights the missing discourse about climate change from the

308   Indian Parliamentary Question Hour. India is one of the most vulnerable countries to

309   climate change. According to the Global Climate Risk Index, in 2019, India was one of

310   the 10 most affected countries due to extreme weather events (Eckstein et al 2021).

311   Yet, we found that PQs about climate change were rarely raised in parliament,

312   indicating that this form of parliamentary oversight is severely under-utilized. On the

313   positive side, the number of PQs on climate change have increased over time, yet with

314   a peak in 2015 – after which there is no steady increase.

315   The number of PQs MP's raised in parliament were neither influenced by the climate

316   vulnerability of their state nor their gender. Among the PQs asked in parliament, MPs

317   were most concerned about the impacts of climate change on agriculture, the coast,

318   and health. PQs on mitigation were focused on energy, agriculture, and aviation

319   sectors. The impacts of climate change on the socially and economically

320   disadvantaged groups of society were rarely mentioned, as were PQs related to

321   adaptation to climate change. MPs received most of their information on climate

322   change from studies and reports, and newspaper articles.

323

*4.1 What influences PQs on climate change in the Indian Parliament?*

325   PQs on climate change in the Indian Parliament seemed largely related to external

326   political events, for example, 2007 saw the sharpest increase in PQs, which was the

327   year that preceded the launch of the National Action Plan on Climate Change.  Also,

328   the highest number of questions (104 questions) were asked in 2015—the year that

329   followed the renaming of the "Ministry of Environment and Forests" to the "Ministry of

330 Environment Forests and Climate Change" with an accordingly expanded portfolio

331 (Economic Times Bureau, 2014).

332 While country vulnerability to climate change does not seem to have led to an increase

333 in PQs on this topic, state vulnerability also does not seem to be an important driving

334 factor that stimulates questions. Parliamentarians from states with higher climate

335 vulnerability did not ask more PQs, as we might expect. Similarly, neither did gender

336 influence the number of PQs asked. However, because the percentage of women in

337 parliament ranged from only 3% to 11% (in the 2014 term, Ahmed 2018) most of the

338 questions related to climate change were asked by men, probably also accounting for

339 a lack of focus on impacts of climate change on women.

340 Over the last twenty years there has been a significant rise in extreme weather events

341 (floods, cyclones, heat waves, cold waves) in India which has had severe impacts on

342 human lives and livelihoods (Ray et al. 2021). However, the spikes in the questions

343 did not correspond to the years that especially severe weather-related disasters

344 occurred. Similarly, the years that states recorded particularly devastating weather

345 events, did not correspond to a rise in PQs on climate change. For example, from

346 2018, Kerala has been witnessing devastating floods every year, but this has not been

347 captured in the PQs from MPs from Kerala.

348 The political party of the MP could be potentially influencing PQs. The states where

349 the MPs were from the opposition party could have asked more PQs as seen from

350 other studies on PQs in India (Ojha and Mishra 2010; Jacob 2014).

351 It is likely that one of the reasons for the low representation of PQs about climate

352 change in parliament is that climate change does not influence voting behavior.

353 Identity politics, which include religion, is one of the important drivers of voting

354 behavior in India (Gaikwad 2018). This is perhaps in contrast to countries such as the

355 US, and in the EU where civil society action has increased the saliency of the climate

356 action on the political agenda (Nash and Steurer 2021).

357 However, this was beyond the scope of this study, and future studies could further

358 explore these aspects.

359

*4.2 Impacts of Climate Change on vulnerable groups*

361 Several studies have shown that climate change will have complex intersecting

362 impacts on different sectors of society, whether on women (Yadav and Lal 2018),

363 children (Dimitrova et al. 2020), disadvantaged caste (Goodrich et al. 2019) groups,

364 or the poor. One might expect that parliamentarians from special interest groups – for

365 instance those from indigenous communities, or marginalized caste groups – may ask

366 questions relevant to justice. While we were not able to explore climate issues with

367 respect to other marginalized groups, with respect to gender, women did not ask more

368 PQs than men. However, in total, male MPs asked 10 times the number of questions

369 asked by women MPs during our study period. This was largely due to an unequal

370 representation of women in parliament (Ahmed 2018).

371 Neither did PQs seem especially interested in exploring issues of socio-economic

372 vulnerability and climate justice. In total, only six PQs focused on differential impacts

373 based on economic and social vulnerability, of which most focused on the differential

374 impacts on the economically disadvantaged. This is a staggering gap considering the

375 importance of caste issues on social justice and access to governmental schemes and

376 policies in India (Dunning and Nilekani 2013). This is in sharp contrast to other PQs

377 in India, which often focus on social welfare especially of historically marginalized

378    groups (Ojha and Mishra 2010). The MPs background also influences the PQs they

379    ask, with MPs from historically marginalized groups asking PQs on the impacts on

380    their group (Shankar and Rodriguez 2014). In the case of climate change, it is likely

381    that issues of climate justice and differential impacts on India society are still finding

382    voice in parliament. By failing to specifically recognize that climate change is having

383    and will continue to have differential impacts on society, the most vulnerable

384    populations will be the most impacted and will have the least access to climate aid

385    (Sultana 2021).

386    4.3 *Climate impacts, mitigation, and adaptation*

387    Unsurprisingly, PQs of climate impacts largely focused on agriculture as it contributes

388    to about 17% of India's GDP, with about 47% of India's workforce engaged in

389    agriculture activities (Gulati et al. 2018). India's agriculture is especially vulnerable to

390    climate change (Dubey and Sharma 2018) – it is not surprising that this is an area of

391    importance for parliamentarians, whose constituencies are largely rural, with 69% of

392    India still living outside cities in areas were agriculture is of major importance.

393    Coastal areas were another sector of concern likely because three of the seven largest

394    Indian cities - Mumbai, Chennai and Kolkata – are located on the coast, and therefore

395    especially vulnerable to sea level rise (Khosla and Bhardwaj 2019). Concerns about

396    fishing livelihoods also exist due to an increase in coastal climate disasters over the

397    years (Sarkar and Borah 2018). Apart from health impacts of climate change, other

398    impacts such as mental health issues, or water stress, do not appear to figure on

399    parliamentarians' minds, however – despite their growing importance in the Indian

400    scenario and globally (Mehran et al. 2017; Obradovich et al. 2018).

401 PQs on mitigation seemed to be more techno-managerial in focus, seeking to

402 understand energy and agricultural policies, for instance – part of a larger trend that

403 has been noted by other researchers in South Asia (Stock et al. 2021).

404 The lack of focus on adaptation is puzzling especially as it is perhaps one of the most

405 important areas of concern for India in future decades. A similar lack of focus on

406 adaptation has also been demonstrated both in media (Keller et al. 2020) and research

407 (Vij et al 2017).  Raising the level of parliamentary debate on adaptation is critical and

408 needs to be foregrounded.

409

410 *4.4 Sources of climate information*

411 Media can perhaps play a more influential role here. Parliamentarians referred to a

412 source for their information on climate change in 10% questions of the PQs asked.

413 Reports covered in the media, seemed to stimulate PQs, indicating that increased

414 media coverage of climate change issues may help stimulate greater parliamentary

415 discussion of critical climate change issues, and driver greater governmental

416 accountability. Media plays a critical role in shaping and reflecting public opinion, and

417 as such, is known to be an important influencer in shaping political debate (Gavin

418 2018). The coverage of climate change issues in Indian print media has increased

419 substantially over the past 15 years, with the greatest increase in reportage coming

420 from the area of climate change impacts (Keller et al. 2020) – this is also where most

421 PQs on climate change tend to focus.

422

423 *4.5 Limitations of the study*

424     The data retrieval was based on the keywords that we chose based on our prior

425     knowledge which was further refined based on the PQs. It is likely that we might have

426     missed some keywords, which could have provided more PQs. However, we think that

427     this is likely to be a small number and would not influence our findings.

428     A major limitation of our study was for the MPs, we only included MPs who asked PQs.

429     We do not have data from MPs who did not ask PQs. This is likely to influence the

430     analysis of research question 2, as zero data has not been included. However, this

431     data was very difficult to retrieve and could not be used in the analysis.

432     In this study we focused on just climate vulnerability of each state and gender as

433     potentially influencing PQs. However, there could be a range of other factors such as

434     political affiliation, major weather or political events, upcoming elections, that could

435     influence PQs. Future studies could perhaps look more closely into the motivations for

436     MPs to ask PQs on climate change.

437

## 5. Conclusion

439     Climate change is one of the biggest game changers facing the world today. India,

440     with its high population density, substantial urban coastal population exposed to

441     climate extreme events, and strong dependence on climate-vulnerable sectors such

442     as agriculture for livelihoods and food security, needs to gear up to cope with a climate

443     emergency that is at its doorstep. In the world's largest democracy, the Indian

444     parliament plays a critical role in shaping Indian policies on climate change. In

445     functioning democracies like India, parliamentary questions are a critical oversight tool

446     that enable parliamentarians to ask questions of legislative and policy importance, and

447     to raise issues relevant to their local constituencies.

448 Despite the importance of climate change for India's future, we find that PQs on

449 climate change represent a very small fraction of all PQs in India over the past decade.

450 Further, despite the fact that climate impacts are largely local, our findings indicate

451 that members of parliament from the most climate vulnerable states are not asking

452 questions on climate change. It is surprising to see issues of climate justice, and of

453 differential climate impacts on especially vulnerable constituencies including women,

454 children, and the poor, are almost completely absent from parliamentary discussions.

455 Our study focused on a few variables, however, to get a deeper understanding of what

456 drives climate discourse in the Indian Parliament, variables such as political party

457 affiliations, and state indicators such as education and health, could be included in

458 future analysis.

459 In conclusion, we find that parliamentary questions on climate change represent a

460 small but could help hold legislature accountable on climate change in India, which is

461 the world's largest democracy, and simultaneously a country especially vulnerable to

462 climate change. We find that the number of PQs on climate issues have increased

463 over time, but there is substantial scope for future growth, especially in critical areas

464 of climate justice, and climate adaptation. Media can potentially play a major influential

465 role in this regard, and this aspect needs to be further explored in future climate policy

466 research.

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469 declare

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654    **Table 1:** Description of the variables used in the multiple linear regression models to test the

655    influence of climate vulnerability of the MPs state and MPs gender on the number of questions

656    asked in parliament. PQs = Parlimentary Questions. MP = Minister of Parliament

| Variable Type | Variable Name | Measurement | Mean ± SE | Median | Unit |
|---|---|---|---|---|---|
| Response Variable | No. of PQs asked by MP | Count | 1.3 ± 0.02 | 1 | No. of PQs asked in one year |
| Explanatory Variable | Climate Vulnerability of State | Continuous | 0.5 1 ± 0.002 | 0.51 | Climate vulnerability index |
| Explanatory Variable | Sitting MP's in Parliaremnt | Continuous | 35.9 ±0.58 | 29 | Ministers |
| Explanatory Variable | Year MP asked PQ | Continuous | N/A | N/A | N/A |
| Explanatory Variable | Gender | Categorical | N/A | N/A | N/A |

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659 **Table 2:** The codes and code descriptions that were used to inductively analyse the

660 PQs

| Sl.No. | Code Category | Code Category Description | Code Sub-category | Code Sub-category Description |
|---|---|---|---|---|
| 1 | Climate Change Aspect | The question refers to the impacts, adaptation, or mitigation related to climate change | Impact | Question refers to the impacts of climate change |
| | | | Mitigation | Question refers to mitigation efforts to curb climate change |
| | | | Adaptation | Question refers to adaptation in response to climate change |

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| | | | Multiple | Question refers to more than one climate change aspect |
|---|---|---|---|---|
| | | | NA | Question does not refer to any of the above categories |
| 2 | Sector | The economic sector(s) responsible for/affected by climate change in a particular question | Agriculture | Questions related to the agriculture sector |
| | | | Coastal | Questions directed at coastal regions and dealing with sea level rise |
| | | | Energy | Questions related to the energy sector |
| | | | Health | Questions on the effect of climate change on human health |
| | | | Industry | Questions related to the industrial sector |
| | | | Water | Questions related to water resources and glaciers |
| | | | Aviation | Questions related to the aviation sector |

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| | | | Livestock | Questions related to the livestock sector |
|---|---|---|---|---|
| | | | Multiple | Questions associated with more than one sector |
| 3 | Social Vulnerability | The question refers to differential impacts of climate change on different sections of society | Gender | Questions relates to differential impacts of climate change based on gender |
| | | | Caste | Question refers to differential impacts of climate change based on caste |
| | | | Class | Question refers to differential impacts of climate change based on class |
| | | | Indigenous People | Question refers to differential impacts of climate change on indigenous people |

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| 4 | Source | The information sources that the question is based on such as a study, report, or article. | Institute | Questions quotes information from a particular institute |
|---|---|---|---|---|
| | | | International agreement | Question quotes information based on an international agreement |
| | | | Newspaper article | Question quotes information from a newspaper |
| | | | Study | Question quotes information from a study |
| | | | Conference | Question quotes information based on the proceedings of a particular conference |
| | | | Multiple | Question quotes information from more than one source |

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672　**Table 3:** Content analysis of the PQs. PQs were coded for sources of climate change

673　information, the aspects of climate change discussed, and mentions of vulnerable

674　communities.

| Codes | Sub-categories | Parliamentary Questions (%) |
|---|---|---|
| Information Source | Total | 10 |
| | Study | 58.9 (% of the total information source) |
| | Newspaper article | 22% |
| | Conference | 11% |
| | Institute | 5.6% |
| | International agreement | 1.1% |
| | Multiple | 1.1% |
| Climate Change Aspect | Total | 71 |
| | Impact | 27.6 |
| | Mitigation | 23.5 |
| | Adaptation | 3.9 |
| | Multiple | 16 |
| Economic and Social Vulnerability | Total | 0.007 |
| | Economically Disadvantaged | 4 PQs |
| | Women | 1 PQ |

| | Indigenous Peoples | 1 PQ |
|---|---|---|

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680 **Table 4:** Nature of PQs asked under each economic sector in relation to climate

681 change aspect (impact, mitigation, and adaptation).

| Economic Sectors | Climate Change Aspect (%) | | |
|---|---|---|---|
| | **Impact** | **Mitigation** | **Adaptation** |
| **Energy** | 0 | 43.6 | 4.8 |
| **Agriculture** | 38.3 | 21.8 | 66.7 |
| **Coastal** | 28.6 | 0 | 4.8 |
| **Health** | 13.4 | 1.8 | 0 |
| **Water** | 7.1 | 1.8 | 4.8 |
| **Aviation** | 0 | 9.1 | 0 |
| **Industry** | 0 | 7.3 | 4.8 |
| **Livestock** | 4.5 | 1.8 | 0 |
| **Multiple Sectors** | 8 | 12.7 | 14.3 |

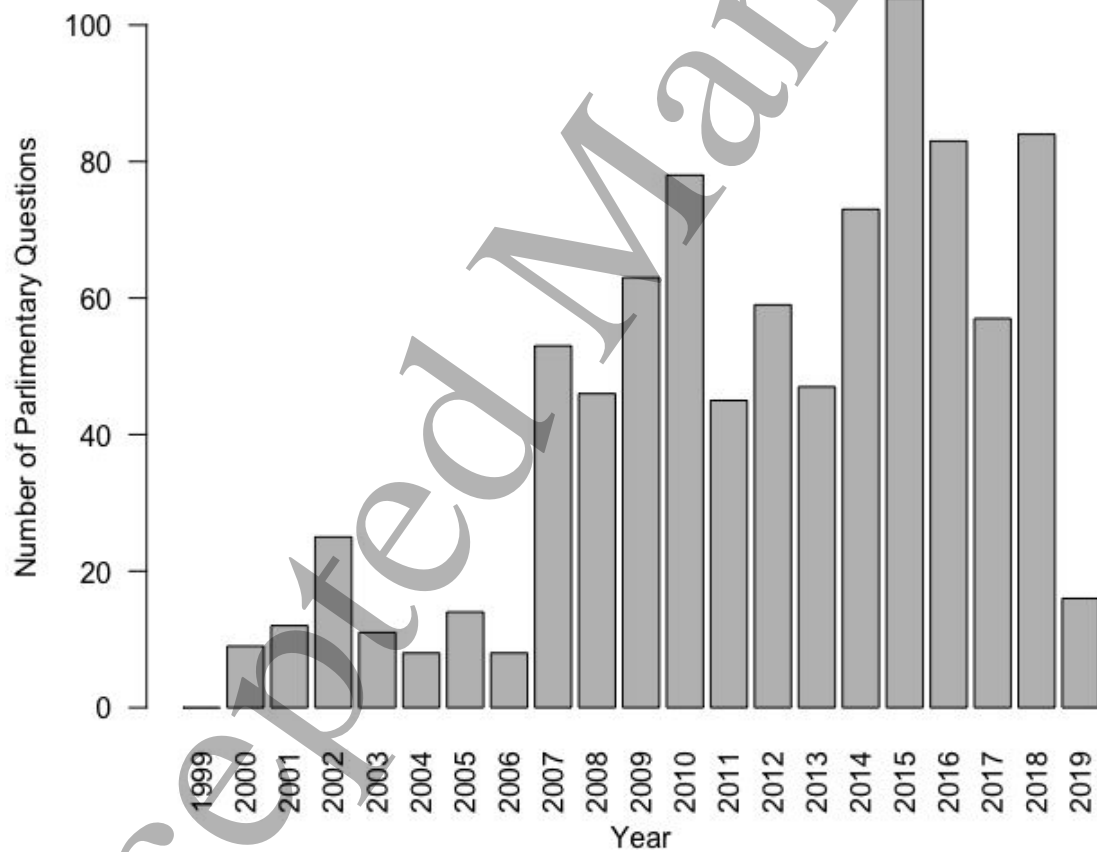682

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693    **Figure 1**: The number of Parliamentary Questions asked by Ministers of Parliament

694    during the parliamentary hour grouped by year (1999 to 2019).



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