

博士論文審査結果報告
Report on Ph.D. / Doctoral Dissertation Defense
National Graduate Institute for Policy Studies (GRIPS)
Professor Chikako Yamauchi

審査委員会を代表し、以下のとおり審査結果を報告します。

On behalf of the Doctoral Thesis Review Committee, I would like to report the result of the Doctoral Dissertation Defense as follows.

学位申請者氏名 Ph.D. Candidate	Rambandage Dhanushka Ravilal Perera		
学籍番号 ID Number	PHD16405		
プログラム名 Program	GRIPS Global Governance Program (G-cube)		
審査委員会 Doctoral Thesis Review Committee	主査 Main referee	山内 慎子 YAMAUCHI, Chikako	主指導教員 Main Advisor
	審査委員 Referee	WIE, Dainn	副指導教員 Sub Advisor
	審査委員 Referee	高橋 和志 TAKAHASHI, Kazushi	副指導教員 Sub Advisor
	審査委員 Referee	PORAPAKKARM, Ponpoje	博士課程委員会委員長代理 Acting Chairperson of the Doctoral Programs Committee
	審査委員 Referee	工藤 友哉 (日本貿易振興機構 アジア経済 研究所 開発研究センター) / KUDO, Yuya (Institute of Developing Economies, IDE-JETRO)	外部審査委員 External Referee
論文タイトル Dissertation Title (タイトル和訳)※ Title in Japanese	“ESSAYS ON THE ENVIRONMENTAL IMPACT ON CHILD HEALTH: THE CASE OF SRI LANKA” 環境汚染が子供の健康に与える影響に関する考察：スリランカの事例		
学位名 Degree Title	博士（政策研究） / Ph.D. in Advanced Policy Studies		
論文提出日 Submission Date of the Draft Dissertation	2021年7月8日	論文審査会開催日 Date of the Doctoral Thesis Review Committee	2021年8月5日
論文発表会開催日 Date of the Defense	2021年8月5日	論文最終版提出日 Submission Date of the Final Dissertation	2021年9月8日
審査結果 Result	合格 Pass		

※ タイトルが英文の場合、文部科学省に報告するため、和訳を付してください

Please add a Japanese title that will be reported to MEXT.

1. 論文要旨 **Thesis overview and summary of the presentation.**

This dissertation investigates the impact of two types of environmental hazards on the health status of small children, who tend to be most vulnerable to any detrimental factors. More specifically it examines how too much and too little rainfall during pregnancy affects the birth weight of children. It further studies how the concentration of one of the critical air pollutants, Sulfur Dioxide (SO₂), influences the incidence of coughs among children aged five and below, and how socio-economic factors are related to the size of its impact. While many studies exist in the related literature, this dissertation contributes to it as follows.

First, the impact of rainfall is quite important in developing countries where many individuals engage in agriculture without very developed irrigation systems. Too much and too little rainfall can lead to floods or drought, thereby reducing the agricultural income substantively, which is their main income source. While it has been already known that positive rainfall shocks (usually more than two standard deviations away from the mean over the past couple of decades in a specific locality) during childhood (or the first year of life) improves subsequent outcomes such as educational attainment and income levels, the impact of similar rainfall shocks during pregnancy is somewhat debated and no study considers possible differential impact across three trimesters. Since placenta and most fundamental organs are developed in the first trimester and the burden on maternal body due to the size of a fetus becomes substantial in the third trimester, there could be heterogeneous impact of rainfall shocks. The current dissertation assesses this possibility by utilizing the records of birth weight from five cohorts of children included in each of the two survey data: Demographic Health Survey 2006 and 2016. Dhanushka combined this with the detailed rainfall data based on the locality level and birth month in order to create the measures for the amount of rainfall during each trimester for each child. The results show that the impact of rainfall during pregnancy is indeed heterogeneous: more than the usual amount

of rain in the first trimester increases birth weight particularly in rural areas, however the same positive rainfall shock in the third trimester decreases birth weight particularly in urban areas, only among boys. A possible explanation for the latter negative effect is given that too much rain can worsen the disease environments such as the amount of bacteria and viruses, which are more worrisome in urban settings.

Second, several studies on the impact of air pollution indicate negative effects of Particulate Matter (PM) and gaseous pollutants (which includes SO₂). However, evidence on the impact of SO₂ is somewhat limited. Also, while the World Health Organization (WHO) introduced the Air Quality Guideline as well as the interim target for each of the major pollutant in 2005, few studies have examined the impact of meeting the interim targets, which are more applicable for developing countries. The current dissertation investigates this focusing on the impact of SO₂. The data on its concentration for major urban areas of Sri Lanka are combined with the data on the incidence of cough for children from the 2016 DHS, based on the survey week and locality. The results of estimating the locality level fixed-effects model suggest that exposure to the level of SO₂ exceeding the interim target increases the incidence of cough among children, and this is found only among relatively poor households.

2. 審査報告 Notes from the Doctoral Thesis Review Committee (including changes required to the thesis by the referees)

Among the members of the doctoral thesis review committee, there was a general consensus about the value of the research. The members also shared the same impression that that both the dissertation and the presentation at the defense were well-organized and clear.

The members made several critical questions and comments as follows:

1. Can the dissertation explain how the DHS data were used (panel of cross-section) and how the main explanatory variables are defined?
2. Can you examine the robustness of the results by incorporating household fixed effects?
3. Can you test whether the positive and negative rainfall shocks have different effects?
4. Can you test whether selective attrition due to miscarriage and still birth can bias your results?
5. Are there any other outcomes than the incidence of cough that you can use for analysis?
6. It would be better to discuss the results of the impact of exposure to SO₂ based on the linear specification even if they are insignificant.

While there were many questions and comments, they were given mostly for further improvement towards journal submission. The members of the committee reached the conclusions that the dissertation was of satisfactory quality, and thus they left the final check entirely to the main adviser.

3. 最終提出論文確認結果 Confirmation by the Main Referee that changes have been done to the satisfaction of the referees

About one month after the defense, the revised version submitted by the candidate was checked by the main adviser, which was found to have mostly addressed the comments. However, there was a couple of errors in estimation methods. Thus the candidate was told to correct them. On September 8, 2021, the final version was submitted and the main adviser found it satisfactory.

4. 最終審查結果 Final recommendation

The doctoral thesis review committee recommends that GRIPS award the degree of Ph.D. in Advanced Policy Studies to Mr. Rambandage Dhanushka Ravilal Perera.