

博士論文審査結果報告
Doctoral Dissertation Defense Results

審査委員会を代表し、以下のとおり、当該学生が博士論文審査に合格したことを報告します。
On behalf of the Examination Committee, I am pleased to report that the student indicated below has successfully defended her/his dissertation.

政策研究大学院大学 教授 高橋 和志
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Studies

プログラム名 Program	GRIPS グローバルガバナンスプログラム GRIPS Global Governance Program (G-cube)	
学位申請者氏名 (学籍番号) Name of the Candidate (ID)	Mr. Tareque Mohammad (PHD20611)	
論文タイトル/ Dissertation Title	ESSAYS ON THE SUSTAINABLE DEVELOPMENT OF SMALLHOLDER FARMERS' WELFARE OF RURAL BANGLADESH	
(和訳/ English Translation)	(バングラデシュにおける小規模農家の福祉向上に向けた持続的開発)	
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1. 論文概要と判定理由

1. Summary of the Dissertation and the Committee's Evaluation

政府や国際ドナーは、2030年までに持続可能な開発目標（SDGs）を達成するための戦略を見出すために、様々な開発プロジェクトを実施し、効果検証している。本研究では、とりわけ、農村部における作物生産の多様化による貧困と飢餓の撲滅と、母親の労働参加による子どもの栄養不良の削減という、小規模農家の社会経済活動の二つの 이슈に焦点を当てている。これらは、貧困を撲滅し、栄養不良を根絶するという、SDG1とSDG2を達成する上での主要な課題に答えるものである。その題材として、本研究は、貧困や栄養不良が顕在するバングラデシュの農家から収集した世帯データを用い、定量分析を行っている。

より具体的には、第2章では、バングラデシュ農村部の小規模農家の作物多様化とインフォーマル信用の利用に対するバリューチェーンプロジェクトの影響を検討した。対象地域では、小規模農家のジュートバリューチェーンを促進するためにランダム化比較試験(RCT)が行われており、RCTの設定を利用して、厳密な統計分析を図った。結果からは、ジュートのためのプロジェクトにも拘わらず、ジュート生産以外にも波及効果をもたらすことが判明した。特に、プロジェクトの多面的介入（技術トレーニング、販売支援、商人とのマッチングプラットフォーム提供など）により、プロジェクト対象地域では、農家の作物多様化が促進され、信用制約も緩和される傾向にあることが判明した。これは当初のプロジェクトでは意図せざる結果ではあるものの、農村開発を促進していく上で、複合的支援を同時に行うことの重要性を示唆するものとして、貴重なエビデンスを提供している。

続く第3章では、労働参加決定における母親の自己決定能力が子どもの栄養指標とどのように関連するか検証している。従来の研究では、母親が働くこと自体の影響を調べるが多かったが、本研究では、母親の労働参加を誰が決めるか（一人で決めるか、それとも夫と相談して決めるか）によって、影響が異なりうることに焦点を当てた点に独自性がある。推定結果からは、労働参加決定において母親が自律的であると、お金の使い途についても女性の主張が通りやすくなる結果、子どもの栄養不良（発育阻害、低体重など）を有意に減少させることが示された。

博士論文の審査会は3月22日に実施された。学位申請者は、研究の動機、目的や手法、また結果の解釈について、基本的にわかりやすく伝えていた。審査員の評価の中央値は4であり、以下のように修正が必要な事項についてのコメントが寄せられた。(1) インフォーマル信用が農家の厚生水準を持続的に向上させうるることについて、より丁寧な議論が求められる。(2) 理論的枠組みを示し、複合的介入が作物生産多様化やインフォーマル信用へのアクセスに影響を与えうる経路を明らかにすべき。(3) 既存研究と比較して研究の独自性がどこにあるのか、明確に述べるべき。(4) 操作変数の妥当性に疑問が生じるため、誘導系の分析も示し、推定バイアスがあるとしてもそれが大きく結果の解釈に影響を与えないことを示すべき。

申請者はこれらのコメントに対応した修正稿を4月18日に提出し、その再審査の結果、中央値が5となった。マイナーな改正要求に応じた最終稿が4月26日に提出され、主査の判断の結果、全てのコメントに対して適切な対応がなされたことを確認した。

2. 論文の内容（手法や結論など）と学術的貢献

2. The Dissertation's Findings, Methodologies, and its Academic Contribution

The main objectives of this study are to find sustainable ways of achieving SDG1 and SDG2, focusing on the welfare improvement of smallholder farmers living in rural areas of Bangladesh who are far behind in achieving the SDG1 and SDG2 targets.

The study contains two research papers that answer several research questions about the welfare of smallholder farmers from rural Bangladesh. In the first paper (chapter 2), it addresses the agricultural development of smallholder farmers by focusing on the changes in crop diversification and informal input finance under the multifaceted agricultural value chain interventions in rural areas of Bangladesh. Given the scarcity of land and incompatible competition in the market, a group of researchers argues crop diversification is a promising strategy to eradicate poverty and sufficient food supply to smallholder farmers. Crop diversification increases the availability of different foods to fill nutritional needs and also provides extra cash and resilience to climate shocks to smallholder farmers. Besides, credit constraints are a long-standing obstacle in the agricultural development of smallholder farmers who live in remote areas. Promoting informal input credit (purchase input from local vendors) can be a sustainable instrument in combating credit constraints among smallholder farmers.

This study uses Bangladesh agricultural value chain (BAVC) data to test the impact of multifaceted interventions on crop diversification and informal input credit among smallholder farmers in rural Bangladesh. BAVC's interventions divided into two groups such as (a) training with linkage meetings and (b) agricultural fairs with crop clinic and a common treatment called trust game received all the treated farmers. They also conducted a trust game between farmers and input sellers in both "a" & "b" group. According to treatment assignment we found three treatment arms (T1=received both "a" & "b", T2 = received "a" only, T3 = received "b" only) and control group. The study divides into two periods – very short-term (immediately after BAVC interventions) and relatively long-term (2 years after BAVC interventions) based on the randomized experiment design. It uses two types of econometric model – ordinary least square (OLS) and Tobit estimation to check the robustness of the estimation results. It also uses several indicators of crop diversity such as crop count, crop group count, high-value crop count, and Simpson's index that represent the crop richness, crop evenness, and both respectively. In the very short-run it did not find any impact of multifaceted interventions on crop diversification. Moreover, for some indicators the results are not consistent between two types of econometric model. In contrast, in the relatively long-term, results were consistent between OLS and Tobit and provide statistically significant positive impact on crop diversification. Besides, it also uses two methods such as OLS and Probit estimation to test the changes in informal input credit use by the same project. The results showed statistically significant impacts of multifaceted interventions on informal input credit under

both the very short-term and relatively long-term, which were consistent between OLS and Probit. To see the sustainability of increased impacts of BAVC, it further checks the amount of fertilizer used for diversified crops in the relatively long-term. The results indicate that fertilizer adoption among treated farmers are positive and statistically significant. However, the impacts of T2 group show statistical significance under all the indicators of crop diversification while only crop count and crop group count are statistically significant under T1 and no outcome variables are statistically significant under T3. Besides, T2 group higher impacts statistically significant impacts on informal input credit. Hence, we can say that in the long-term farmers who receive T2 interventions produce more diversified crops and have more access to informal input credit compared to others.

In the second paper (chapter 3), this thesis addresses the changes in child (under 5 years) nutrition indicators (stunting, wasting, and underweight) due to the maternal workforce participation decisions. Female work is considered an influential poverty eradication tool that can also associate child nutrition indicators because of mothers' leading role in childcare in developing countries, in particular, rural farm households where formal childcare facilities are scarce. Existing literature focuses on the impacts of maternal employment on child nutrition based on mothers' job characteristics (on-farm, off-farm), time allocation to jobs and childcare, income from employment, and so on. Due to the inconclusive results from the current literature, there is room for exploring the impacts of maternal employment on child nutrition because of confounding income effects (increased household income) and time effects (decreased maternal time to childcare) of maternal employment. The study explores a new dimension of maternal employment (maternal autonomy in workforce participation decision) and examine its associations on child nutrition indicators using panel data from an integrated household survey.

Specifically, it explores the maternal autonomy in workforce participation decision to child nutrition indicators using Bangladesh integrated household survey (BISH) data collected in 2015-16 and 2018-19 segregating maternal autonomy into 1 if mother takes workforce participation decision by herself and 0 otherwise. IV estimation techniques are used to control for endogeneity arises from unobserved heterogeneity. The study uses two samples such as working mothers who have child under age 5 years and all mothers (working + non-working) who have child under age 5 years. The former sample is used for our main analysis and the latter sample is used to test the robustness of the results. It further tests the associations of maternal autonomy in food decision to check whether only labor force participation or any decision-making power matters. The main estimation results showed that the mothers' autonomy in work participation decisions positively affects the child nutrition indicators. The outcomes from the robustness estimation for the working mother sample using maternal autonomy in food decisions (1 if mother take food purchase decision by herself and 0 otherwise) are consistent with the main results. Besides, the generalizability test using all mother sample (1 if mother take food purchase decision by herself and 0 otherwise) also confirms the consistency of our main results. Finally,

the study extends to see the heterogeneous associations of maternal work place such as work at home or outside. The results indicate that the child health indicators showed positive associations with mothers who work from home and no significant association with mothers who work outside. Hence, the study concludes that maternal autonomy in workforce participation decision is an important factor in child nutrition.

From the results the study summarizes that for achieving SDG1 and SDG2 in rural areas of developing countries, promoting crop diversification among smallholder farmers through multifaceted interventions and facilitating women employment opportunity and their motivation to take part in income generating activities can be viable tools. The findings of this dissertation contribute to the growing literature on the crop diversification and access to credit among smallholder farmers of rural areas of developing countries as well as promotion of child nutrition among rural farm household of low and-lower-middle income countries. It indicates that multifaceted interventions addressing constraints of smallholder farmers in crop diversification can be a strategy to increase crop diversification and informal input credit among smallholder farmers. Besides, maternal autonomy in workforce participation decisions (a new dimension of female autonomy) can be a considerable tool that can contribute to the child nutrition.

3. 審査員からの主要コメントおよび修正内容

3. Comments by the Examiners and the Revisions Made

Major comments include: (1) Regarding the conceptual framework, clarify why the use of T2 is better than T1 in encouraging crop diversification. (2) Rewrite the interpretation and implication of informal input credit for long-term, sustainable development in rural Bangladesh. (3) More careful and detailed discussion about the causal role of women's family status on workforce participation decisions as well as child nutrition. (4) Explain contributions of the study to the literature, especially in comparison to Holland and Rammohan (2019) paper.

For all of those comments, the applicant addresses them properly in the revised thesis by substantially revising the conceptual framework, rewriting the interpretation regarding the access to input credit, discussing carefully about the role of women's autonomy in labor force participation decisions for child nutrition improvement, and explicitly differentiating this thesis from other existing studies.