

## Extended Abstract

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<b>Paper/Poster Title</b>	<b>Agricultural management during India's first Covid-19 wave: Evidence from the urbanising region of Bangalore</b>
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<b>Abstract</b>	<i>200 words max</i>
<p>We examine how the first Covid-19 wave in India between July and December 2020 affected farm management decisions by households in the urbanising region of Bangalore. In India, a nationwide lockdown was implemented between March and June 2020, but the number of Covid-19 infections rose considerably only after the lockdown had been lifted. Based on face-to-face data collected just before the lockdown and phone survey data collected at the end of the first Covid-19 wave, we examine changes in farm management decisions regarding farm input use and crop marketing of 253 households. We find that farmers used fertiliser and pesticides for a significantly higher share of their crops, an increase in male and female on-farm labour use as well as the share of crops marketed, while the use of hired farm labour and the average number of conservation practices used per plot declined. We relate these changes to the household's level of concern about a Covid-19 infection and livelihood characteristics measured pre-Covid, controlling for changes in rainfall and crop choices. We find a positive relationship between concern about Covid-19 and farm input use and crop marketing. Strong concern about a Covid-19 infection is negatively related to hiring labour. Households who marketed at least one crop prior to the pandemic reduced the share of crops marketed during the first Covid-19 wave, while households relying on off-farm income used fertiliser for a higher share of crops and were more likely to start hiring labour.</p>	
<b>Keywords</b>	Covid-19, farm inputs, agricultural markets, Covid-19 concern, livelihoods, India
<b>JEL Code</b>	Q12, Q13, J22, Q43, Q20 see: <a href="http://www.aeaweb.org/jel/guide/jel.php?class=Q">www.aeaweb.org/jel/guide/jel.php?class=Q</a> )
<b>Introduction</b>	<i>100 – 250 words</i>
<p>Lockdowns that were implemented all over the world in response to the spread of the Coronavirus raised concerns about their effects especially for poor households (Barrett, 2020; Lele et al., 2020; Torrero, 2020). Studies in several developing countries found a reduction in total household income and expenditures in response to lockdowns (Mahmud and Riley, 2021; Janssens et al., 2021), while studies focusing on food security and dietary diversity found mixed effects (Amare et al. 2021; Hirvonen et al., 2021; Jaacks et al., 2021). Despite this growing body of literature, little research has been conducted on the implications of the Covid-19 pandemic after the initial lockdowns had been lifted. In India, the first Covid-19 wave hit between July and December 2020, only after the relaxation of the strict nationwide</p>	

lockdown that was implemented between March and June 2020. This raises the question to what extent the pandemic has affected farm households beyond lockdown periods. In India, the first Covid-19 wave coincided with record rainfalls, providing favourable conditions for agricultural production. Besides, agriculture was mostly exempted from Covid-19 related restrictions. Against this background, we attempt to disentangle the relationship between Covid-19 during India's first wave of infections and agricultural management decisions, while controlling for local rainfall conditions and farmer's crop choices in both years. Our study can contribute to an enhanced understanding of effects of the Covid-19 pandemic for farm households in developing countries beyond lockdown periods.

**Methodology**

*100 – 250 words*

We combine face-to-face survey data that was collected in the urbanising region of Bangalore just before the Indian nationwide lockdown between February 4 and March 10, 2020, and phone survey data collected at the end of the first Covid-19 wave between December 2020 and February 2021. We collected data on farm input use for the same time periods (June-December) in 2019 and 2020, and measure changes between both years in the following ways: First, we measure the change in the share of crops cultivated by a farmer for which fertilisers, pesticides and irrigation were applied and which were marketed. Second, we measure the household-level difference in male and female on-farm labour as difference in the total hours worked on the farm on an average day. Third, we use a dummy variable indicating whether the farmer has hired labour or not. Lastly, we measure the change of use of conservation practices as the difference in the average number of conservation practices used per plot. As a proxy for Covid-19, we use a variable measuring concern about Covid-19. We asked the household's primary caregiver: "How do you feel about the possibility that someone you know might become infected with COVID-19 (coronavirus disease)?" We estimate fixed effects panel regressions to analyse the association between Covid-19 concern and the outcome variables. Furthermore, we correlate pre-Covid-19 household characteristics with the changes in the outcome variables using OLS regressions with village fixed effects. We control for changes in crop choices and rainfall (data obtained from the Karnataka Natural Disaster Monitoring Centre) in both analyses.

**Results**

*100 – 250 words*

We find a significant increase in the share of crops that farmers apply fertiliser and pesticides to, as well as an increase in household male and female on-farm labour and the share of crops that are sold in the market. However, the use of hired farm labour and conservation practices declined. Relating these changes to the level of Covid-19 concern suggests that those who are worried about an infection increased the share of crops that fertiliser was applied to. We find a decrease in the share of crops for which pesticides are used for households with no concern about Covid-19,



but an increase for those who are very worried. Households who are concerned about Covid-19 increased the share of crops that were marketed, household on-farm male (by on average 1.6 to 1.8 hours) and female (1.4 to 1.9 hours) labour. Strong concern about a Covid-19 infection is negatively related to the probability of hiring labour, while low or no concern about Covid-19 is associated with a decrease in the average number of conservation practices used per plot by one practice. Relating the changes in the outcome variables to pre-Covid livelihood characteristics suggests that households who marketed crops prior to the pandemic reduced the share of crops which were marketed, while households relying on off-farm income increased the share of crops for which fertilisers were used and were more likely to start hiring labour. Our results also suggest that an increase in rainfall is negatively related to the share of crops for which farmers used irrigation and pesticides, decreased on-farm male and female labour, and the use of the average number of conservation practices per plot.

**Discussion and Conclusion**

**100 – 250 words**

Our results suggest that agriculture during India’s first Covid-19 wave seems to not have been restricted heavily by a lack of access to inputs like fertilisers and pesticides in the Bangalore region. Yet, we find a decrease in hired labour during the first Covid-19 wave, which could have three reasons: First, the outflux of migrant labourers from megacities like Bangalore at the beginning of the pandemic might have reduced the supply of hired labour. Second, activities by adult household members, like off-farm work or education, were affected during the first wave, which might have led to an increase in available household labour used on the farm. This would also relate to the increase in the supply of on-farm labour. Females in particular might have dropped out of the labour force to focus on caregiver responsibilities, increasing their availability for farm-related activities. While it seems like agriculture did not suffer too much from supply-side restrictions and, facilitated by favourable rainfall, might have had a buffer-function for households to ensure their livelihoods, our results suggest that there might have been demand-side restrictions in terms of the functioning of agricultural markets. While, generally, farm households seem to have increased the share of cultivated crops that they sold, possibly to compensate for income losses from other sources, households that were engaged in marketing prior to the pandemic reduced the share of crops that were marketed, indicating that this group of farmers might have been affected by lower demand for farm produce or supply chain restrictions even beyond the lockdown.

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