



2019 GLOBAL PH.D FELLOWSHIP PROGRAM[2019.7.25]

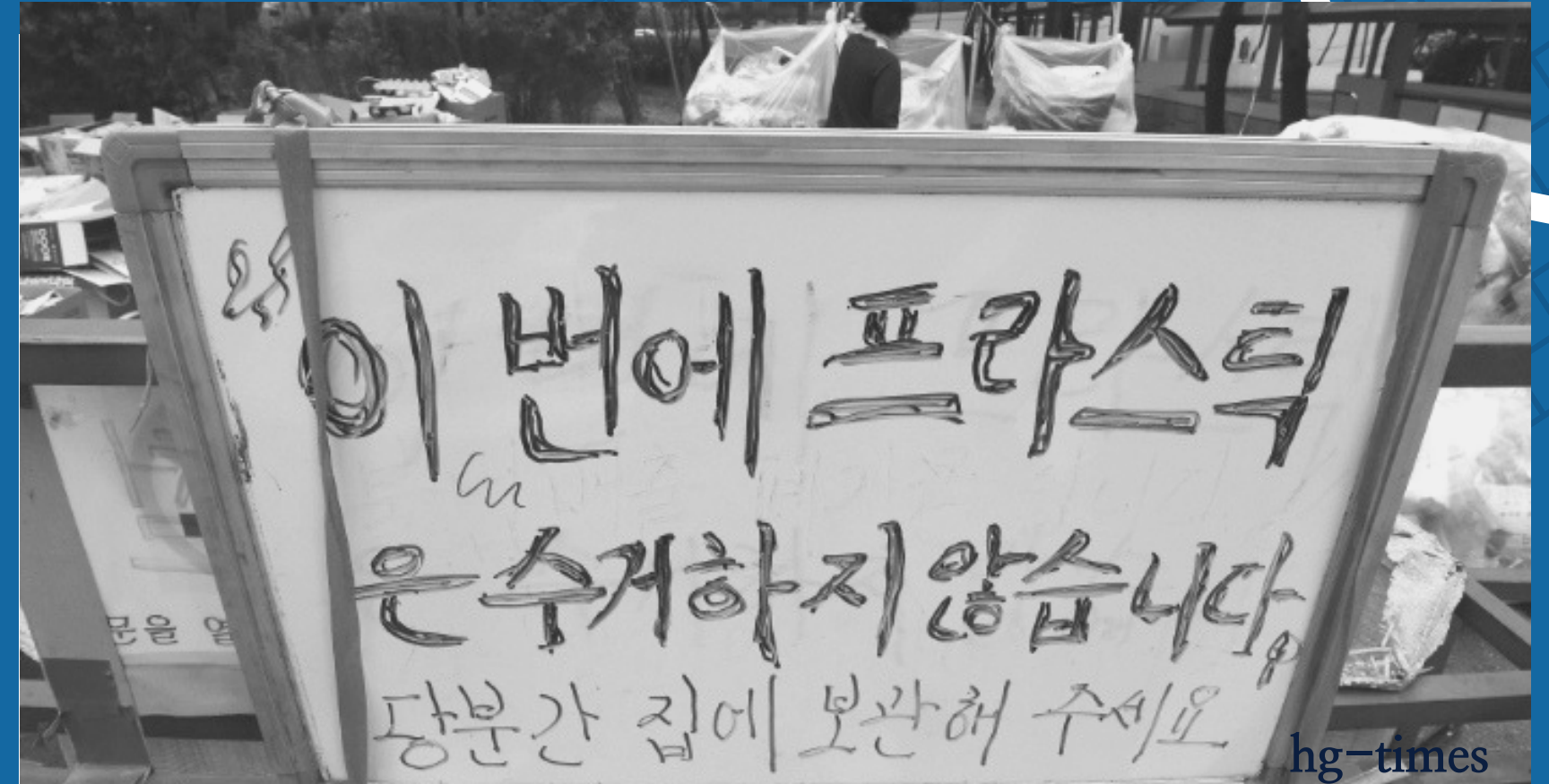
# **AN ANALYSIS ON THE EFFECT OF INTERNATIONAL RAW MATERIAL PRICES ON THE TRADE AND COLLECTION IN KOREAN RECYCLING MARKET**

# MOTIVATION



## RETURN OF ILLEGALLY EXPORTED WASTES

- A total of 6,300 tonnes of illegally exported waste dump was returned from the Philippines [2019.2]



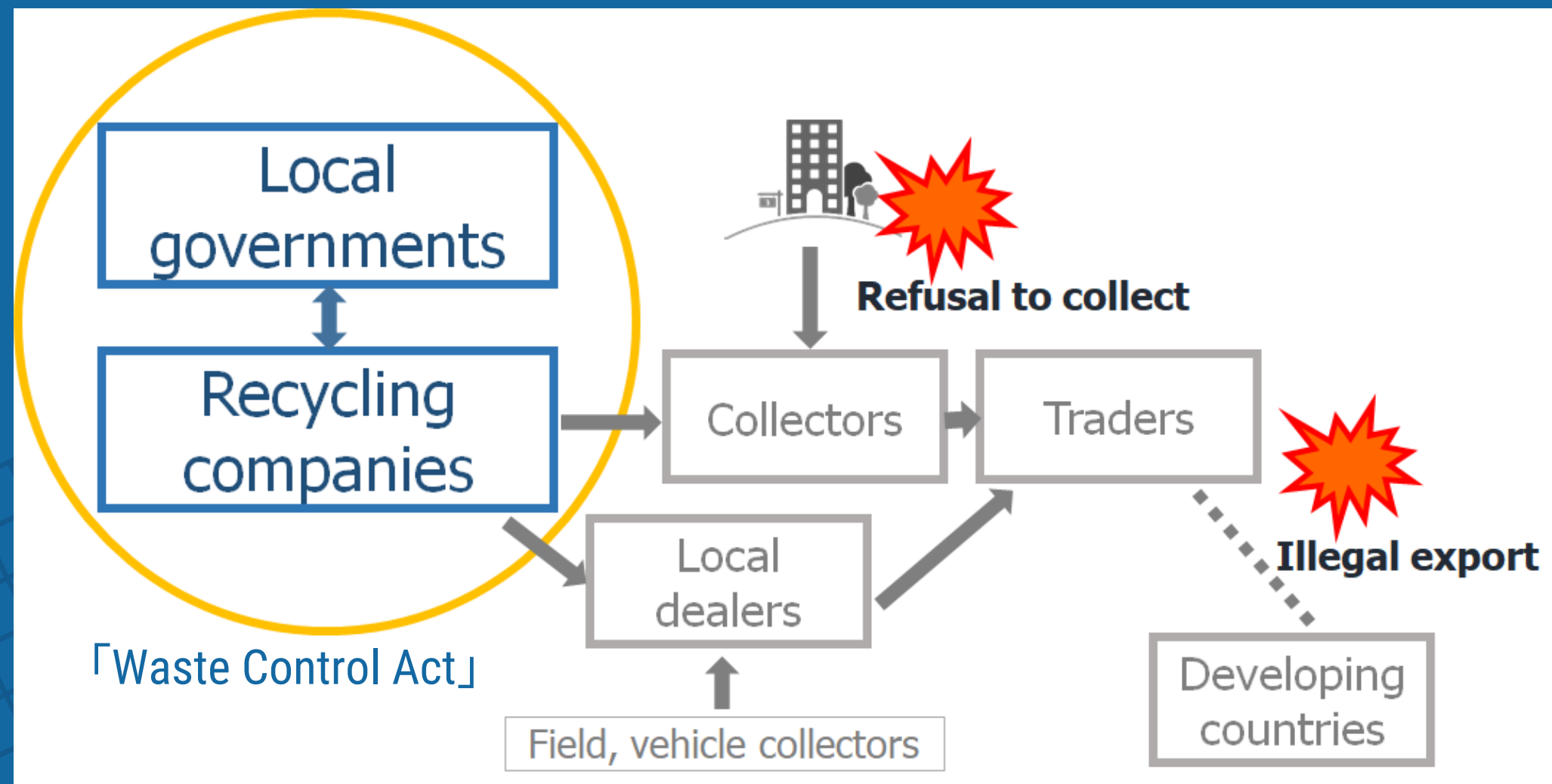
## REFUSAL TO COLLECT PLASTICS

- Due to the decreased profitability, recycle companies refused to collect plastics [2018.4]

# BACKGROUND: INSTITUTIONAL ASPECT OF RECYCLING SECTOR

## BY 「WASTES CONTROL ACT」

- The tasks related to municipal solid waste(MSW) belonged to **local governments**
- On behalf of the local government, **private recycling companies** are allowed to conduct the tasks by public contract



## BUT IN THE REAL WORLD...

- **Various** recycling companies take part based on private contracts
- Sometimes they **do not fulfill their duty properly** leading an inevitable and sudden government intervention



# INFORMALITY OF RECYCLING SECTOR

✓ Disparity in perceived market size: 7,000 vs 70,000

- The disparity in estimated number of local dealers(gomulsang) between Ministry of Environment(2006) and themselves(Peoplepower21, 2015, as cited in Kang, 2016)
- A plausible reason can be stemmed from **its formulation**
  - It was formulated as **after-war vagrants' mean of living** in 1960 and became **a venue of trade for stolen goods**(Yoon, 2014)
- However, the informality of recycling sector is **worldwide phenomena**(UNEP, 2015)
  - A considerable amount of waste is treated in informal sector in developed countries and traded to developing countries illegally

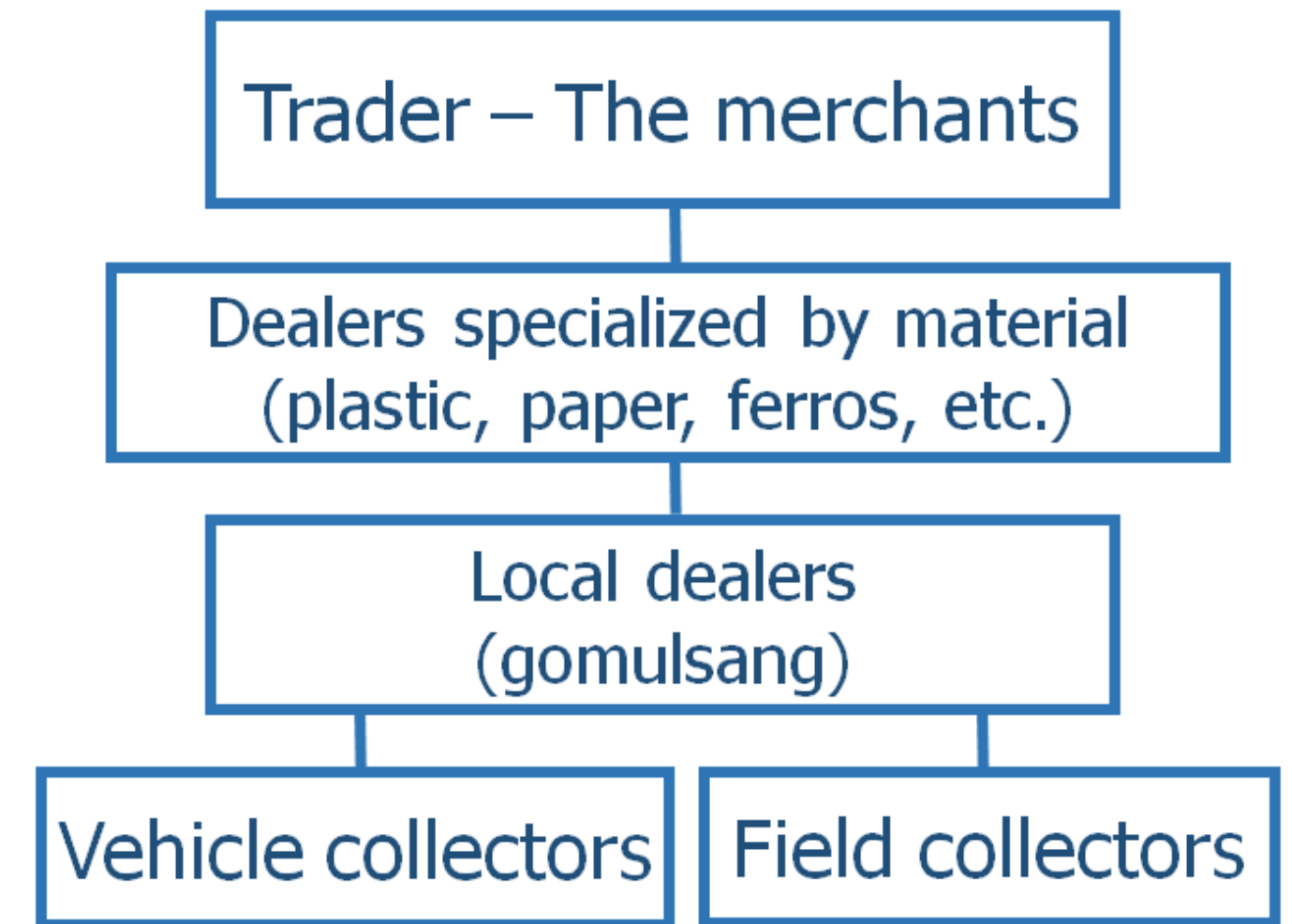
✓ Due to the **informality** of private recycling sector,  
**we lack a common knowledge platform** to start discussion

# WHEN SPECULATED AS A MARKET

Kang(2016)

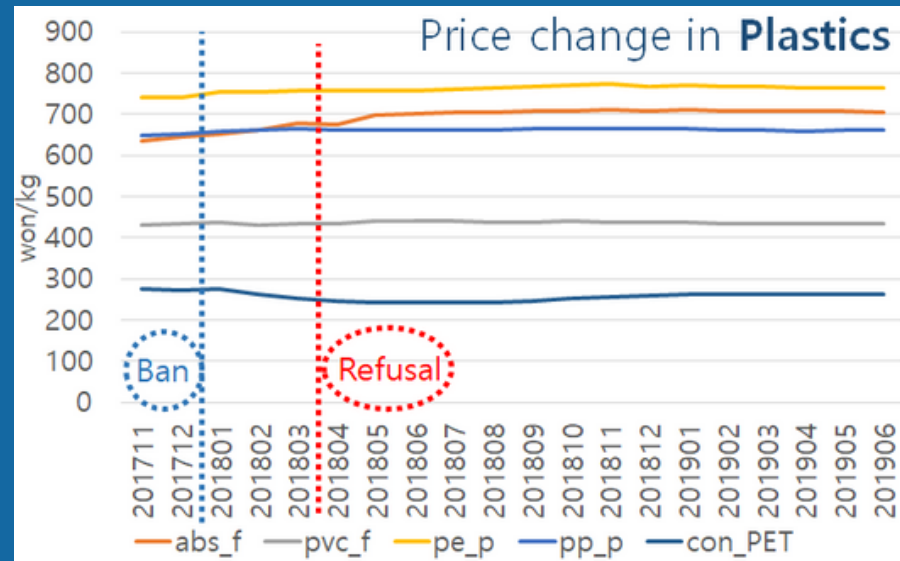
- An anthropological approach to the people and practices in recycling sector
- **RECYCLING SECTOR AS A MARKET**
  - The sector is a market which is strictly **driven by price signals** from each agents in its **hierarchical structure**
  - The traders set the elementary prices reflecting the external drivers: **raw material prices, national GDP, Chinese GDP**

Kang(2016)



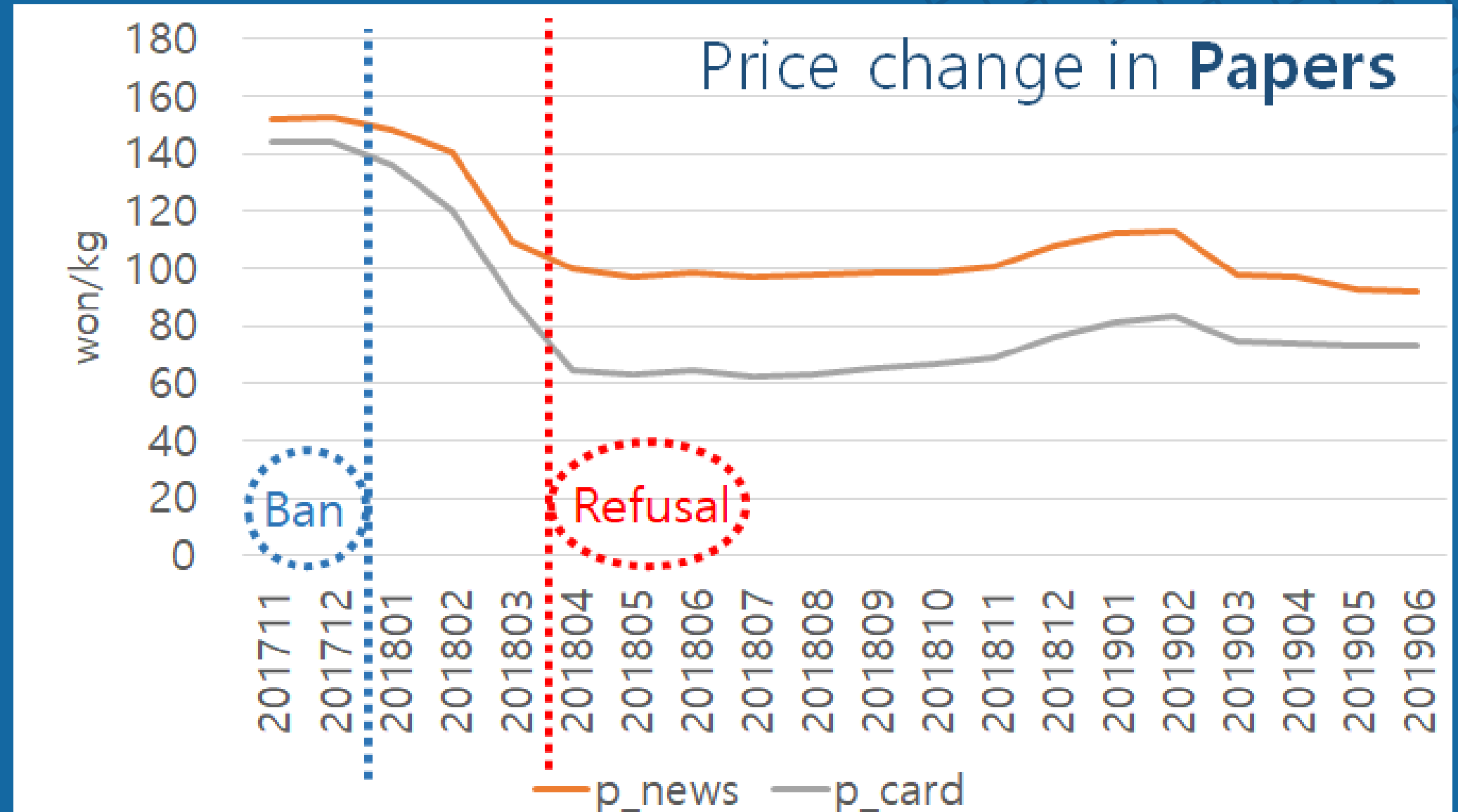
# A LOOK INTO THE OUTBREAK OF CHINESE BAN

When recycling sector is speculated as a market



Survey for Recyclable Resources Market (Korea Environment Corporation)

- Although China banned import of plastic, **price change in plastic is not noticeable**
- Instead, the **paper shows a clear decrease in price**, about 60 %, in early 2018
  - The collectors who had been treating general recyclable confronted **financial deterioration due to the decreased price of paper**, and **refused to collect the low-valued plastics**
- The Chinese policy did not reflected to the market as a effective signal, the price, only resulting the accumulated plastics to turn to other destination



# WHEN SPECULATED AS A MARKET

## Enhanced Predictability

- A Sudden challenge can be understood as a result of deliberate decisions in which various signals in the market are reflected
  - Therefore, each agents behavior can be more predictable

## To do that,

- The **external drivers** - raw material prices, national GDP, Chinese GDP, political change and etc.- **need to be scrutinized**
  - The correlation coefficient between price of paper and crude oil is  $-0.627$  ( $p\text{-value} < 0.003$ )
- To uncover their effect, **a thorough understanding on the market mechanism needed**
  - The structure of the market and how a specific property of the market affect each agents' decision making process which can bring about civil inconvenience



# RESEARCH OUTLINE

## OBJECTIVES

1. Which **external drivers** affect the Korean recycling market  
raw material prices, Chinese and Korean GDP, policies, and etc.

and to which extent ***their change reflected to the market price***?  
of paper, plastics, glass, steel and aluminum

2. How **the characteristics** of the market are reflected to its **mechanism**  
structure, actors, and etc. habitual trade practice

and ***result in certain change*** ?  
in price and decisions to stop trading or collecting

3. How **related policies** are observed in the market  
ban on certain material's trade, and etc.

and how they ***influence to the public*** through the market?  
accumulation of uncollected materials, a new policy implementation to consumers, and etc.



# RESEARCH OUTLINE

## DATA

- **Survey for Recyclable Resources Market**
  - From 2003 to 2019, Korea Environment Corporation
  - Monthly collected **price data on paper, plastics, glass, steel and aluminum** from representative recycling companies by province
  - Partly included price and volume data of imported raw material
- More specific price and **qualitative data which will be collected in field research**
  - **Structure, actors, habitual trade practice, perceived market drivers and price data in detail**

## STRATEGY

- The market **structure and drivers** will be identified **with qualitative approach**
- With the information of **the price change and variables**, a statistic model will be designed to **explain the market quantitatively**

# EXPECTED RESULTS & IMPLICATIONS

## Reduce uncertainty

### & Build a common knowledge platform on recycling sector

- This research help to **reduce the uncertainty** in current recycling market
- With increased predictability, we can **prepare for the social inconvenience** which can be caused by it's malfunctioning



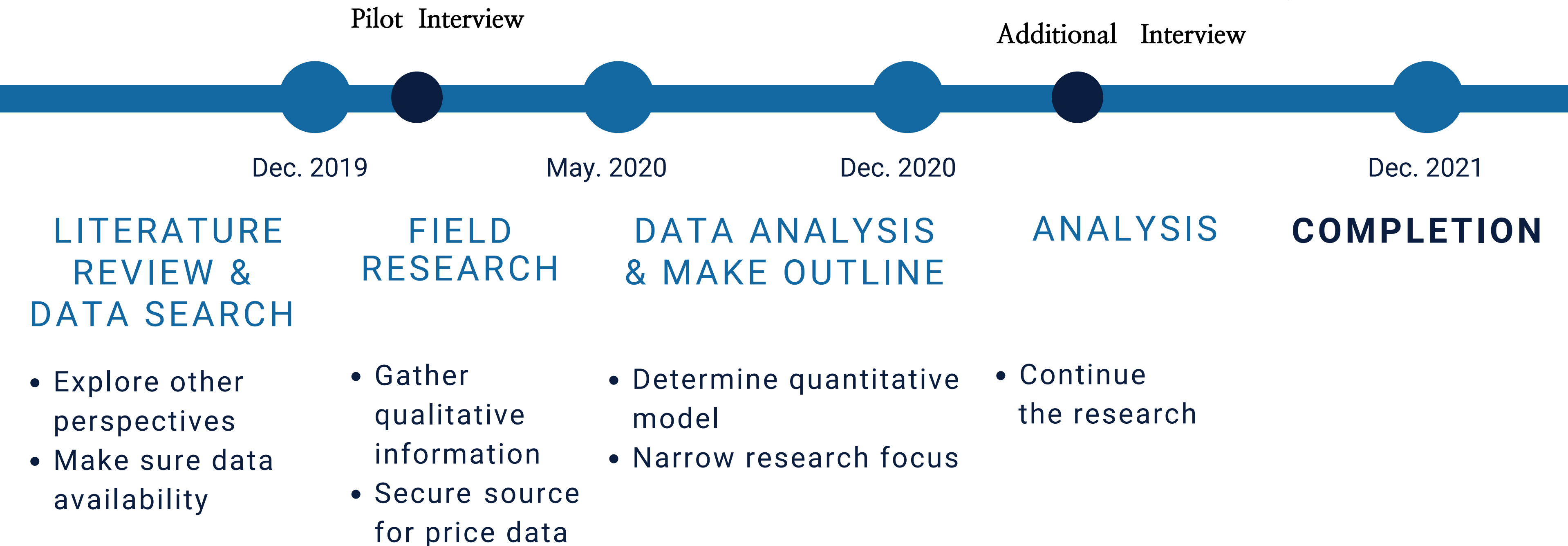
**Chinese ban on  
the papers in 2021**

### In the long run

- We can accumulate understanding on the recycling sector and **build a common knowledge platform**
- Furthermore, government can **intervene in more deliberate way** that makes the recycling companies more **competitive and sustainable**

# RESEARCH TIMELINE

## FROM START TO COMPLETION



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# THANK YOU

Q&A

