



# **DAMAGE DISTRIBUTION OF TYPHOON NO. 21 IN 2018 ON OSAKA AND WAKAYAMA BASED ON QUESTIONNAIRE SURVEYS**

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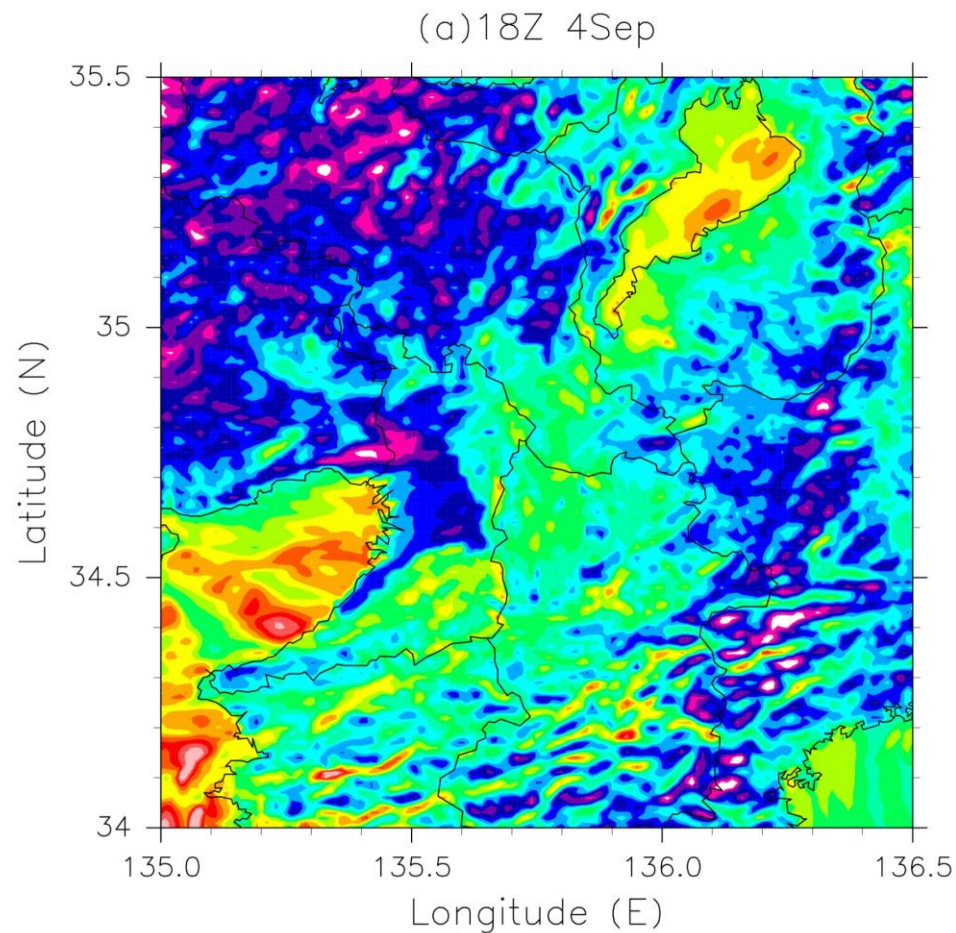
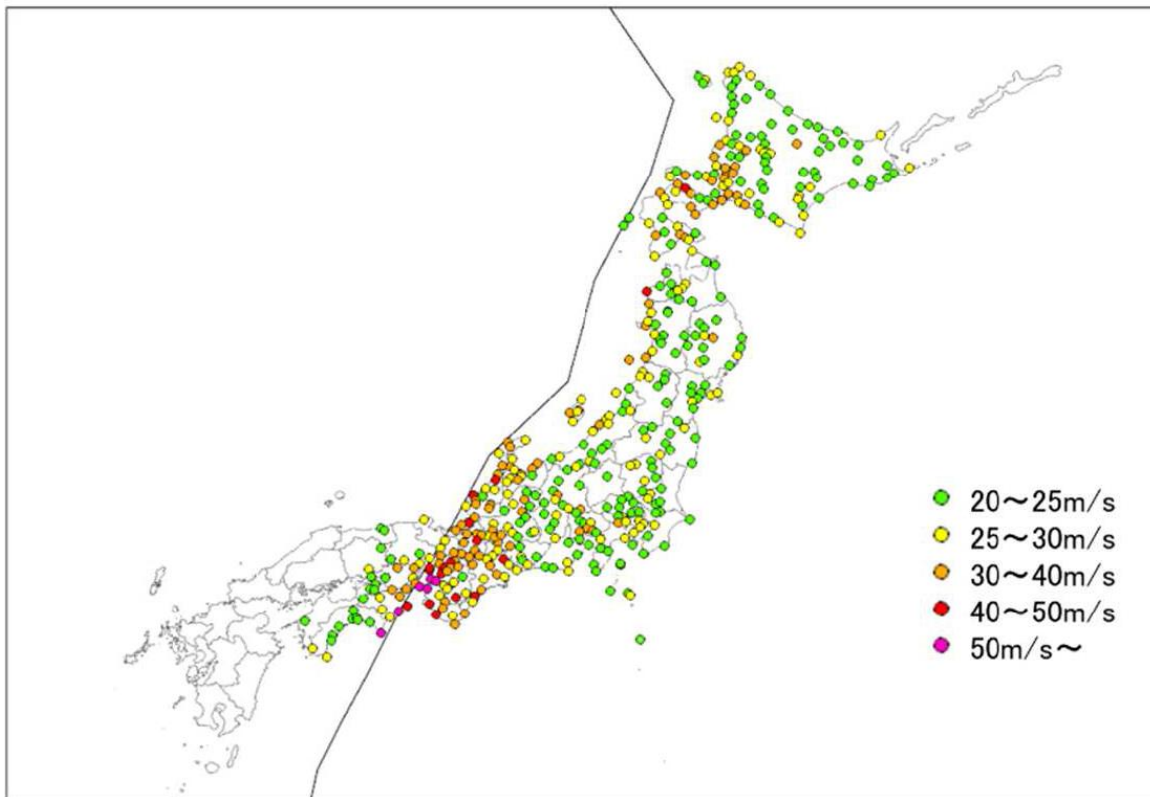
# TYPHOON JEBI



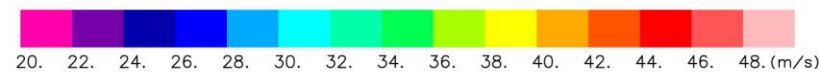
- **Struck** Japan on the 4 September 2018
- Report from the **JMA** (Japan Meteorological Agency) it achieved a maximum one-minute sustained wind speed of **55 m/s**, the strongest to hit mainland Japan in 25 years.
- More than **22,000** houses were reported to have been damaged to some extent during the event, added with **14** deaths and injure **1011** people.



# TYPHOON JEBI



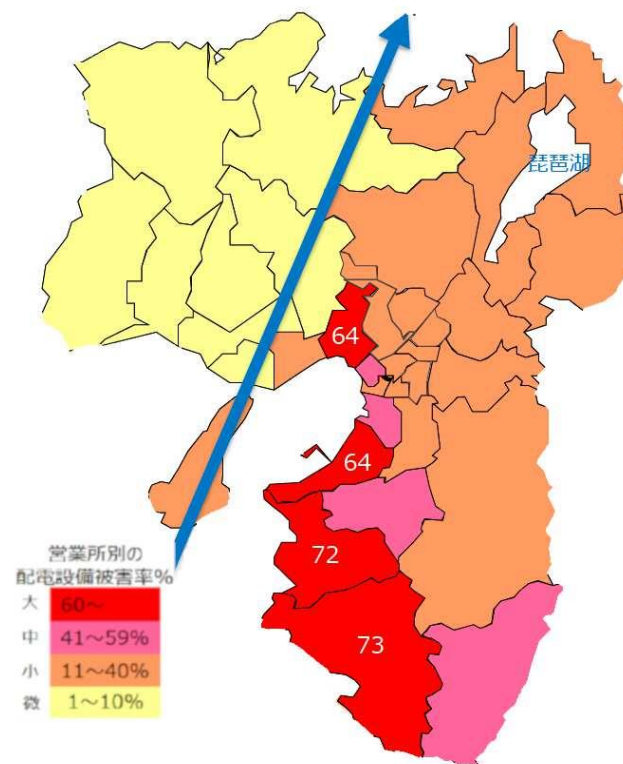
**Maximum Instantaneous  
Wind Speed Distribution**



# LOCATING DAMAGES

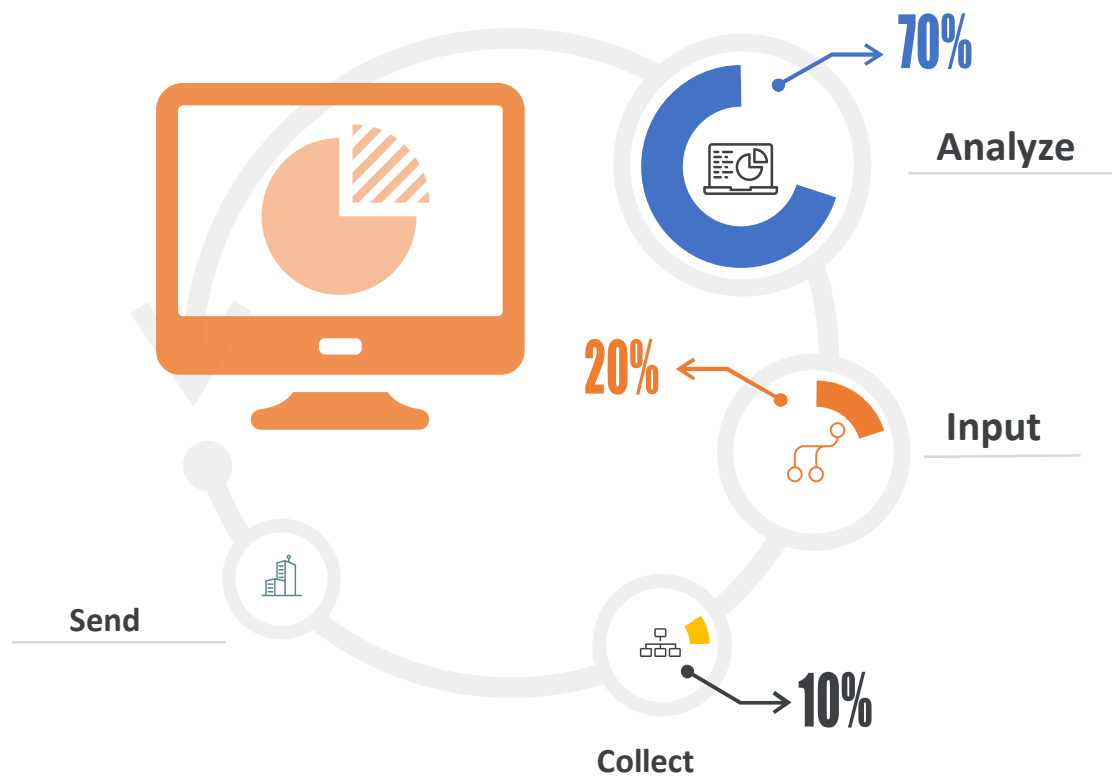
最大瞬間風速の大きい方から20位 9月3日0時~9月5日24時)

順位	都道府県	市町村	地点名 日ヨ	最大瞬間風速			
				(m/s)	風向	月日	時分
1	大阪府	泉南郡田尻町	関空島(カンクウジマ)	58.1	南南西	9/04	1338
2	和歌山県	和歌山市	和歌山(ワカヤマ)	57.4	南南西	9/04	13:19
3	高知県	室戸市	室戸岬(ムロトシサキ)	55.3	西	9/04	1153
4	和歌山県	和歌山市	友ヶ島(トモガシマ)	51.8	南)	9/04)	13:14)
5	大阪府	泉南郡熊取町	熊取(クマトリ)	51.2	南	9/04	1340
6	徳島県	海部郡美波町	日和佐(ヒロサ)	50.3	東	9/04	1105
7	徳島県	阿南市	蒲生田(カモタ)	48.8	東	9/04	11:13
8	福井県	敦賀市	敦賀(ツルガ)	47.9	東南東	9/04	1500
9	大阪府	大阪市中央区	大阪(オオサカ)	47.4	南南西	9/04	1403
10	愛知県	常滑市	セントレア(セントレア)	46.3	南南東	9/04	14:17
11	滋賀県	彦根市	彦根(ヒコネ)	46.2	南東	9/04	14:13
12	和歌山県	西牟婁郡白浜町	南紀白浜(ナンキシラハマ)	45.8	南南東	9/04	1133
13	兵庫県	神戸市中央区	神戸空港(コウベクウコウ)	45.3	南南西	9/04	1355
14	三重県	尾鷲市	尾鷲(オウセ)	45.0	南南東	9/04	1330
15	石川県	金沢市	金沢(カナザワ)	44.3	南南西	9/04	1757
16	大阪府	堺市堺区	堺(サカイ)	43.6	南	9/04	1350
17	北海道	虻田郡倶知安町	倶知安(クッチャン)	42.4	南東	9/05	0224
18	和歌山県	日高郡日高川町	川辺(カワヘ)	42.2	南東	9/04	12:11
19	福井県	坂井市	三国(ミクニ)	42.0	南	9/04	16:19
20	兵庫県	神戸市中央区	神戸(コウベ)	41.8	東	9/04	1341



## Damage Rate of Kansai Electric Power's Sales Offices

# QUESTIONNAIRE



Number of distributed: **4000**

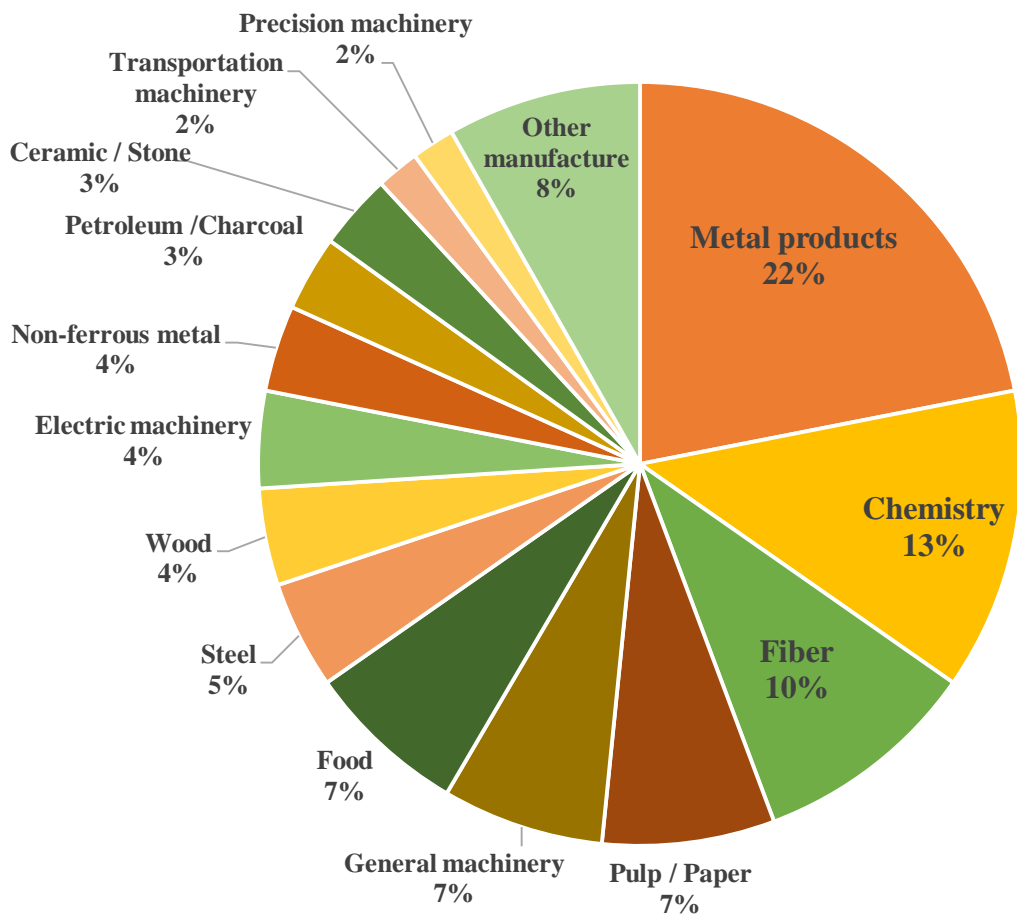
Response:

(a) Manufactures : 219

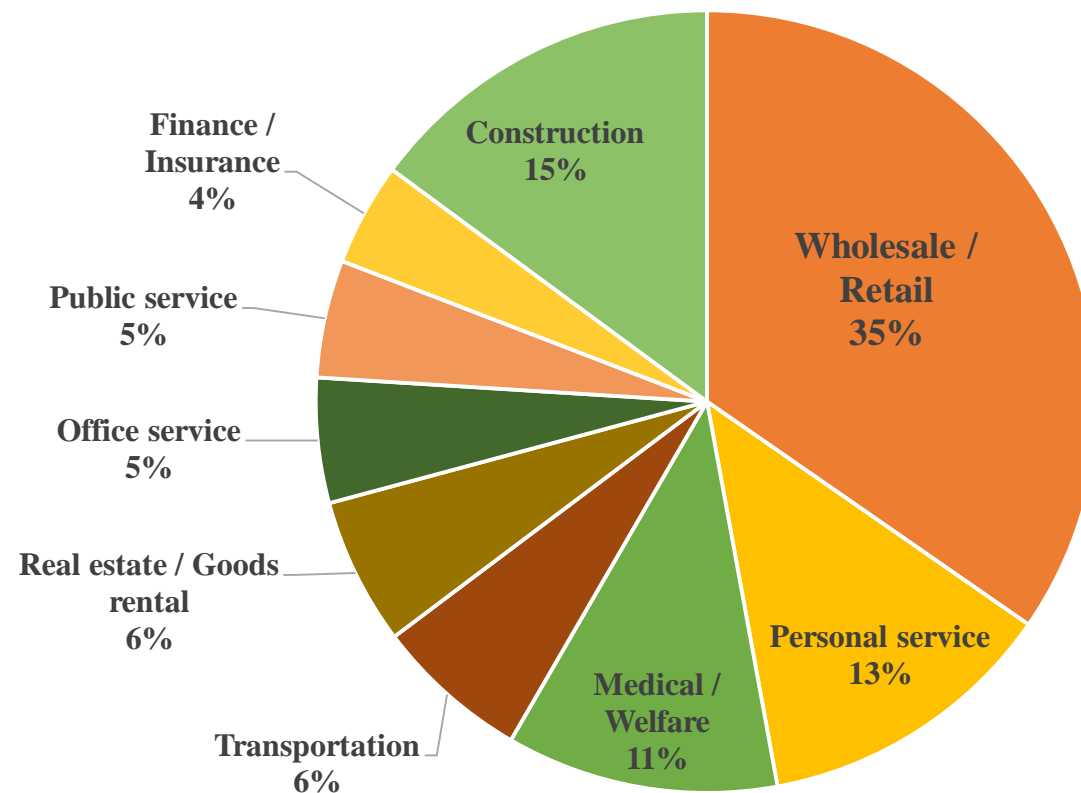
(b) Non-manufactures : 329

(c) Response Rate: **13.7%**

# QUESTIONNAIRE



**Manufactures**



**Non-Manufactures**



# KEY POINTS

- Only **few** companies damaged by **inundation** from the typhoon, with non-manufacture industries suffered more than the manufacture one.
- **Equipment damage** suffered as additional damage due to building damage for both manufactures and non-manufactures.
- In some companies, both **water supply** and **gas supply** were disrupted when the **electricity turned down**. This presented the dependencies between one lifeline to another lifeline that is critical for BCP.
- Kansai Airport closure hit industries in Osaka more than Wakayama, especially for manufacture industries. In addition, **port closure** duration were **longer** than power outage duration in Osaka.

# SUMMARY

- We presented how the **damage** distributed in both **Osaka** and **Wakayama** prefectures during typhoon No. 21 in 2018.
- We identified how several **hazards** brought by typhoon heavily **affected** industrial sectors.
- **Multiple** damages were suffered by most of the companies, from **building** damages through **equipment** and **inventory** damages.
- Industrial sectors also got **loss** from the disruption of **lifeline** activities, with **power outage** became the most influential one.
- Having the **identification** about the **damage** and **loss** from the lifeline disruptions are essentials to plan **recovery** process and **strengthening** resilience, especially when developing business continuity process (**BCP**)





**Feel free to comment!**  
Any question and suggestion

ありがとうございます

