Increasing rice production: a proposed strategy during and after Covid-19 pandemic

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Abstract. The covid-19 pandemic has many impacts on human live. One of them is a disruption of food supply and distribution from the centre production to intermediate and end users. Whereas the assurance of sufficient rice as a staple food at household, local, regional and national levels, is very crucial. One of strategies to increase national rice production in the current situation is through intensification. This study was conducted based on National Statistical Bureau’s data of production and rice planting in year 2000. Data were analyzed statistically and classified all production areas (administrative basis) into high or low category. The analysis showed that there were six provinces in category high productivity including Jakarta; with Bali as the highest productivity of 60.78 kw/ha. Meanwhile 28 other provinces in low productivity with Babel as the lowest of 28.56 kw/ha. Furthermore, there were 239 districts in category of low production and 210 in high production. Accordingly, the intensification should focus on the low cluster production areas. Adjustment of government budget as a stimulus for rice production during and after covid-19 should reoriented as a special treatment and does not depend on National Deliberation of Agricultural Development Plan (Musrenbang).

1. Introduction

Agriculture plays an important role in maintaining and enhancing food sovereignty and the country’s economic growth. National Agriculture priority programs for 2020 - 2024 include increasing the availability, accessibility and quality of food consumption; increase in value added and investment in the real sector and industrialization [1]. Indonesian Food Agriculture, almost over 70 percent, is a form of the farming folk. The community farming have a positive support on reserving communities’ food in countryside, as long as farmers still grow the paddy.

As the existing condition of community farming, a stimulus plays an important role for farmers to support them in increasing productivity, guaranteeing the price and distributing the rice production to the market. The development of the food crop sub-sector in the future is faced with quite complex challenges, including the need for food which continues to increase as a result of an increase in population, conversion of productive land to non-productive land, consumer demands for product quality, increasingly fierce market competition, and environmental changes. Other strategic factors that will affect the development of food crops are certified varieties [2]. In addition, the Civid pandemic began in early 2020, had impacts on human life. One of them is the declining of purchasing power due to interruption or disturbance of some economic activities such as
transportation, industry, other services, and even agriculture. In agriculture sector, the supply or distribution disruption potentially impact on food scarcity [3]. In fact, the provision of rice as one of the staple food in certain quantities is a must available at the family, local, regional and national levels.

The President has explicitly stated there are seven regions with food deficits, especially in paddy. This statement gives a sign that increasing production is the absolute answer to do. The food self-sufficiency program has become one of the work programs in every period of change in Indonesia's leadership. However, the increasing in the amount of funds allocated to increase rice production and the productivity has not been able to provide satisfactory returns [4].

The increased production can be done in two ways, namely, intensification and extensification. The Intensification is a solution as a limited implementation of technology in the rice farming cultivation system. Meanwhile, extensification is a solution to the limited capacity of a region to optimize its natural resources. In the context of the current Covid 19 Pandemic, intensification to increase staple food production is one of the suite efforts in planning and strategies for providing rice for the national.

Based on Law Number 25 of 2004 concerning the National Development Planning System, it has mandated the compilation of an integrated planning document from the Central Government to the regions, including the preparation of the Government Work Plan (RKP). This RKP is an activity plan that is the result of a comparison of proposals from the regions based on the results of the National Deliberation of Agricultural Development Plan (Musrenbang) [5]. Musrenbang is an annual agenda where people meet to discuss the problems they face and decide on short-term development priorities. When priorities have been arranged, they are then proposed to the government at a higher level, and the proposals are categorized based on functions and budget allocations. Musrenbang is a bottom-up approach in which provincial government voices can actively influence National budgets plans and how development projects are structured. The community must also ensure that the development carried out by the government is in accordance to local needs [6].

Drawing from the current issue of sortage in rice production, this paper will look at recent statistic data on rice production and do a short analysis. Based on that, the analysis will propose a quick response to provide a national rice supply strategy regarding to the technology approach and funding as a stimulus strategy.

2. Material and methods
The study was conducted by analyzing recent data on production and planting of paddy in national and provincial level from The National Statistical Bureau (BPS). The data used were production and planting in 2019 that published in 2020. Furthermore, the data were analyzed statistically and determined into high and low productivity both in national and provincial level. A benchmark to cluster the productivity was used as the score of national average productivity. If the score of productivity in one province below or same with the average score then it was categorized as high productivity and vica versa. Result of the analysis subsequently interpreted descriptively.

3. Result and Discussion
Table 1 showed the rice productivity by each province in 2019. The national average production for that year was 51.14 kw/ha. Hence, there were six provinces above the average, namely Bali, West Java, Central Java, East Java, Aceh and Jakarta. How those provinces were able to have high productivities? Bali had the highest rice productivity (60.78 kw/ha) because it highly associated with their irrigation system called Subak that ensured the water supply during growing time. Meanwhile, high rice productivity in West Java and Aceh was closely of using legowo row planting technology. These two provinces were known as the highest concern in the developing the planting row legowo. According to the report, until 2017, the coverage area in East Java and Aceh using the legowo were 29% and 18% respectively [7]. Later, the technology are remain used until now.

Meanwhile, high rice productivity in Central and East Java was supported by seed technology. The provincial government cq Agricultural Office encouraged the use of qualified and certified seeds,
including therein made efforts to turn using rice superior varieties (VUB) to replace old or local varieties used such as IR-64 and Cihong. The dominant superior varieties used were Inpari 13, Inpari 30, Inpari 33, and Inpari 42 with the planting coverage as many as 52.3 ha and 89.95 ha for Central and East Java, respectively [8].

| No | Province       | Productivity (Kw/Ha) | No | Province       | Productivity (Kw/Ha) |
|----|----------------|----------------------|----|----------------|----------------------|
| 1  | Bali           | 60.78                | 18 | Central Sul.   | 45.40                |
| 2  | West Java      | 57.54                | 19 | North Sul.     | 44.79                |
| 3  | Central java   | 57.53                | 20 | Jambi          | 44.57                |
| 4  | East Java      | 56.28                | 21 | Papua          | 43.48                |
| 5  | Aceh           | 55.30                | 22 | West Papua     | 41.67                |
| 6  | Jakarta        | 53.96                | 23 | East NT        | 40.82                |
| 7  | North Sum.     | 50.32                | 24 | Southeast Sul. | 39.27                |
| 8  | South Sul.     | 50.03                | 25 | Maluku         | 37.82                |
| 9  | West NT        | 49.78                | 26 | South Kal.     | 37.69                |
| 10 | Banten         | 48.41                | 27 | Riau           | 36.56                |
| 11 | South Sum.     | 48.27                | 28 | East Kal.      | 36.41                |
| 12 | West Sul.      | 47.96                | 29 | North Maluku   | 32.43                |
| 13 | Yogyakarta     | 47.86                | 30 | North Kal.     | 32.40                |
| 14 | West Sum.      | 47.58                | 31 | Riau Islands   | 32.30                |
| 15 | Gorontalo      | 47.18                | 32 | Central Kal.   | 30.35                |
| 16 | Lampung        | 46.63                | 33 | West Kal.      | 29.23                |
| 17 | Bengkulu       | 46.03                | 34 | Babel          | 28.56                |
|    | National (ave) | 51.14                |    |                |                      |

Source: [9] (calculated)

Table 1 also showed that 28 provinces had productivity below the national average. Four-least-productivity-provinces were dominated by swamps. The swampy area with its inherent characteristics limited the rice productivity. The swampy characteristics also happened in South Sumatera, Riau and South Kalimantan. Yet South Sumatera and Riau had more irrigated paddy land and contributed to the provincial productivity. Meanwhile in South Kalimantan, the productivity was supported from the irrigated paddy land and utilisation of local adaptif variety that has been upgraded (modified) through researh and became a local superior variety. Therefore, the other low productivity provinces still have to work hard to increase their productivity.

Land that has not been utilized optimally was sub-optimal land such as dry land, tidal swamp, and swamp where productivity was relatively low. If managed properly, the land could turn into productive lands for the development of cultivation of various food crop commodities. The undeveloped breeding business of seeds/seedlings at production centres has resulted in the price of seeds/seedlings being expensive, even resulting in the circulation of many fake seeds/seeds in the community which in the end was very detrimental to farmers. Besides that, the farmer institution has not functioning optimally [1].

Reflecting to the above explanation on the six highest and four lowest productivity provinces, then attempt to implement a paddy specific location innovation was compulsory. Various basic technologies as instrument for increased productivity were already available in universities and research institution. For instance, Indonesia Agency for Research and Development have designed
adaptive technologies in the form of a package and components and ready to be implemented in the field. Some of the technology such as integrated crop management (ICM) for irrigated rice fields, rainfed rice fields, upland rice, swampland rice, Hybrid Rice, and other component technologies, that suit with field condition.

Furthermore, in-depth analysis on the rice productivity in district/city within provinces results on 210 districts/cities in high rice productivity and 239 districts/cities with low productivity as in Table 2. Take Aceh as example which had high productivity in provincial level. However if it was analysed in district/city level, Aceh comprised only 42.8% (below 50%) district/city with high productivity. This analysis give insight that rice productions were concentrated in certain areas. Thus there were possibilities to improve productivity in the low productivity’s provinces and districts or cities. In addition, Table 2 give a picture that intensification still a relevant approach for the involved stakeholders in national and provincial level.

| No. | Province      | No Ricefields | High  | Low   |
|-----|---------------|---------------|-------|-------|
| 1   | Bali         | 9             | 3     | 6     | 66.67 |
| 2   | West Java    | 27            | 7     | 20    | 74.07 |
| 3   | Central java | 31            | 13    | 18    | 58.06 |
| 4   | East Java    | 38            | 17    | 21    | 55.26 |
| 5   | Aceh         | 22            | 9     | 12    | 57.14 |
| 6   | Jakarta      | 6             | 3     | 1     | 33.33 |
| 7   | North Sum.   | 33            | 17    | 15    | 48.48 |
| 8   | South Sul.   | 24            | 6     | 18    | 75.00 |
| 9   | West NT      | 10            | 4     | 6     | 60.00 |
| 10  | Banten       | 8             | 3     | 5     | 62.50 |
| 11  | South Sum.   | 17            | 8     | 9     | 52.94 |
| 12  | West Sul.    | 6             | 3     | 3     | 50.00 |
| 13  | Yogyakarta   | 5             | 3     | 2     | 40.00 |
| 14  | West Sum.    | 19            | 11    | 8     | 42.11 |
| 15  | Gorontalo    | 6             | 3     | 3     | 50.00 |
| 16  | Lampung      | 15            | 6     | 9     | 60.00 |
| 17  | Bengkulu     | 10            | 5     | 5     | 50.00 |
| 18  | Central Sul. | 13            | 1     | 9     | 75.00 |
| 19  | North Sul.   | 15            | 6     | 8     | 57.14 |
| 20  | Jambi        | 11            | 6     | 5     | 45.45 |
| 21  | Papua        | 10            | 6     | 1     | 25.00 |
| 22  | West papua   | 13            | 3     | 9     | 90.00 |
| 23  | East NT      | 22            | 12    | 10    | 45.45 |
| 24  | Southeast Sul.| 17            | 3     | 2     | 14.29 |
| 25  | Maluku       | 11            | 7     | 1     | 25.00 |
| 26  | South Kal.   | 13            | 9     | 4     | 30.77 |
| 27  | Riau         | 12            | 1     | 6     | 45.45 |
In a context of providing rice supply during and after pandemic, rice intensification program through suitable technology application needed to be focused in the low productivity areas (provincial or district level). Adjustment of government budget allocated as stimulus for rice production during and post-pandemic Covid 19 have to be designed no longer based on the deliberations of agricultural development plan (Musrenbangtan). Yet, it was required to be designed as a direct funding to increase rice production in the low productivity areas to support intensification with suitable and specific technology. As [4] stated that funding management is one aspect to support succesful of rice productivity.

4. Conclusion
There were six provinces with high rice productivity. Eventhough, not all districts/cities within these clusters had high productivities. Therefore, intensification strategies will depend on the characteristis location and suitable technology.

Intensification with suitable technology is a plausible option to provide rice availability around Indonesia. The program should support with special budget allocation as a stimulus during and after covid pandemic. In addition, the target location for intensification has to be selected not base on Musrenbangtan.

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