Agricultural value chain financing: a case study in Ciamis District, West Java Province

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\textbf{Abstract.} Smallholding farmers frequently deal with shortage of working capital to cover farm costs. Given the applied terms and conditions, a lot of farmers unable to access the current People’s Business Credit (KUR), while a holistic value chain financial support is required to achieve sustainable food production. Limited capacity of formal rural-based financial institutions encourages the local money lenders to take opportunity of financially support the farmers. In response to this issue, a case study was conducted in Ciamis District, West Java Province. Primary data was collected using an interview technique. Data were organized, processed, and interpreted using a descriptive type of analysis. The study revealed that the rice farmers need an inclusive credit support from pre-planting to post-harvest and marketing of their products. Farmers require working capital to continue their farm activities and to support value chain financing of the agribusiness. Although the existing local micro financial institutions showed good performance, however they lacked fund and access to formal financial institutions such as banks or CSR soft loans. Government is suggested to strengthen the existing local micro financial institutions by linking them to sources of funds and to support business to business relations for better service to smallholding farmers. Inclusive value chain financing implies that farmers, micro financial institutions, and local governments are strongly integrated to achieve better farm performance. Ministry of Agriculture has a strategic role to take initiative to strengthening an inclusive agricultural value chain financing on the existing local micro financial institutions.

1. Introduction
Indonesians are highly dependent on rice crop. As a staple food, its availability and accessibility by all people at affordable prices have been the government concern. In its short-term agricultural development strategic planning (2020-2024), the Ministry of Agriculture have clearly stated how to manage programs and activities to maintain sustainability of agricultural resources with the availability of agricultural infrastructures. Among the programs and activities are \cite{1}: (a) Increasing the availability, land protection, and water management (auditing agricultural land, expanding agricultural land, stipulating agricultural development area, preserving and or maintaining land fertility, optimizing the use of abandoned agricultural land, maintaining the existing soil fertility and improving marginal land, maintaining the available water resources and developing alternative water sources both surface and ground water, improving the irrigation networks and infrastructure functions, managing water saving technology, developing water harvesting techniques with small reservoirs and long storage, and developing water absorption techniques); and (b) Revitalizing farmer’s financial support and
agricultural financial institutions (optimizing People’s Business Credit/KUR schemes, developing agricultural microfinance institutions, and facilitating agricultural insurance).

The vast growing economic development following the application of technology in many aspects have also resulted in reduction of farmer’s land ownership, and hence the agricultural land area employed. The conversion of agricultural land to other uses would not be easy to control and it is obvious that such condition would have a major impact on agricultural and food production. With all this situation, even with such a small piece of land, the programs and activities should be well implemented, and the rice crop farmers should be significantly treated to obtain the highest production achievable. Therefore, smallholder food crop farmers will be the main target to be supported with various agricultural facilities, including financial schemes to enable sustainable production. Rice production is prioritized so that Indonesia would not be depending on import and with less foreign spending, the country would to some extent better off in its expenditure balance.

Smallholders face many difficulties in accessing financial sources. The official source of funding, the KUR scheme is not always available to these farmers with specific terms and other related conditions. With all the problems associated with financial support, these farmers clearly need open arms to lift them out of such a situation. It appears that the current rural finance scheme is developing with favorable conditions for farmers. The government should expand existing schemes that allow financing facilities for smallholders in inclusive value chain financing. This scheme will easily meet production costs and farmers can earn income immediately after harvesting, because financial institutions that provide financial support also act as off-takers for farmers’ production.

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It is fortunate that with Corporate Social Responsibility (CSR) program, several large state-owned companies could support micro, small, and medium enterprises (MSMEs) using their annual reserved profit. CSR policy is a legal strategy to empower MSMEs’ human resources through education, business development training, and local worker’s recruitment. The 2% annual profit reserved for CSR fund is used to cover costs of various types of community empowerment businesses [2]. This program is currently growing, including that of developed by the state-owned bank company through PT Mitra Bumdes Nusantara (MBN). Back in 2017, the MBN was established by 7 state-owned companies and have been well progressing with several subsidiary business organizations. One of the subsidiary organizations was found in 2018, PT Mitra Desa Pamarican (MDP) at which PT Bank Mandiri (Mandiri), one of the leading state-owned bank companies play a significant role in its development. CSR fund was used to provide modern agricultural facilities, including an integrated modern rice milling unit with large warehouse, agricultural lab, and other building facilities. The MDP located in Ciamis District, West Java Province run by professional, including millennial farmers who are working closely with the rice farmers in cooperation with the farmer’s group/federation of farmer’s group (kelompok tani/gapoktan).

After several years a synergy program introduced by Mandiri with its People’s Business Credit (KUR) scheme, the farmers have to some extent enjoyed the cooperation. With sufficient input production, the rice crop farmers are happily working in their respective land. Mutual benefit through good cooperation is put forward and the farmers so far could have enjoyed new term of their environment. Since the marketing of farmers’ production is guaranteed, the next planting season is insightful. In this context, the locally established financial institutions, easy to access, and available at specified time according to crop planting calendar is highly required. PT MDP as source of capital and located in rural area is well recognized and endeavored in favor of the farmers.

PT MDP has two main financial schemes for small-scale rice farmers. First, a cooperation scheme with Bank Mandiri to distribute KUR credit to selected farmers. Borrowers are those who have been recognized as good farmers, both in terms of character and discipline in credit repayment. This scheme follows the official KUR terms and conditions, including its main requirements, namely (a) the amount of credit packages (up to Rp12,811,000/ha/planting season or 5 months duration), (b) an interest rate of 6% per year, and (c) payments immediately after harvest. As an off-taker, PT MDP will buy farmers' products at the prevailing market price. PT MDP will then process farmer’s paddy using their rice mills.
to produce several product items, such as medium and premium rice and other by-products to obtain added value. PT MDP will repay the credit on behalf of the borrowers-farmers to Bank Mandiri.

Second, financial assistance provided by a non-profit foundation, namely the Mandiri Amal Insani Foundation (MAI), which has a cooperative relationship with PT MDP. Loans from MAI are applied similar to the KUR scheme, but do not bear interest to the borrower. It is important to note that other financial supports from different organizations are welcome as PT MDP could expand its operations to other neighboring regencies.

A sign of improved agricultural financial support along with its value chain has been clearly seen from the way farmers respond to their farm activities. With such significant improvement, the relevant question is yet to be proved in the future, whether similar scheme conducted by PT MDP would sustainably increase to cover larger area and number of smallholding farmers. With this question, the objective of this paper is to provide description of how to maintain and continue developing the existing financial institution based on the current rice farm condition to empower the farmers. Recommendation is prepared to support agricultural production and enhance the active role of local financial institution.

2. Materials and methods

2.1. Materials

The study was conducted in one of rice producing areas, i.e., Neglasari Village, Pamarican Subdistrict, Ciamis District, West Java Province where PT MDP (Mitra Desa Pamarican Limited Company) is located. Primary and secondary data were collected through individual farmer interview technique using a questionnaire and focus group discussion with local stakeholders, i.e., representatives of local agricultural service officials, PT MDP, and financial institutions. Other information was also obtained through observation at farmers’ rice fields.

2.2. Methods

All of the data and information were organized to obtain relevant analysis tables. These data and information were analyzed descriptively.

3. Results and Discussions

Some studies indicate the importance of agricultural loan to support farmers and their farm production. The state-owned agricultural banks need to reform to allow smallholding farmers to access to microcredit. It has been proved that such credit would enable the farmers to meet agricultural technology, apply farm recommendation level of production inputs, and enjoy higher agricultural productivity [3-5]. The role of rural financial institutions is very important to take care of many problems associated with loan access and how the farmers use the credit for good agriculture practices [6].

Micro credit finance institutions are vital in achieving farmer’s objectives. They are not only providing funds to cover production costs, but also educate the farmers on how to properly manage their farming operations. The role of micro finance institutions would have significant impact for the farmers/farmer’s groups to develop cooperative community and encourage better farm management. The government, in this stage need to promote and advocate the farmers to be commercially viable through an appropriate policy framework. The farmers need a strong legal framework and dynamic government agricultural development policies to enabling environment for microfinance [7,8].

Moreover, it has been proved that microcredit policy has an enormous impact for poverty alleviation. Therefore, similar policy needs to be developed by establishing relevant supporting measures, such as enhancing agricultural working capital subsidies, expanding agricultural insurance, and improving the implementation efficiency of microcredit policy scheme [9].

3.1. KUR service to support farmers

The shortage in farm capital has been raised as the most subject the smallholding farmers frequently faced. There are formal financial institutions operating at local level, such as rural unit of banks, however with the bank’s collateral and other administrative requirements for their credit facility, the farmers could lower their interest and discourage to apply. Like normally rural people, farmers who mostly with
low level of education are not familiar with paper works and uncomfortable with other formal modern financial support procedures. Farmers have limited chance to get bank loan, and this encourages them to approach informal money lenders who always ready to offer any amount without formalities. This is a more realistic option for farmers to access to source of fund although it applies higher interest rate [10].

A study conducted in rural area of Yogyakarta Province indicates that age, marital status, and education attainment are significantly affect the characteristics of those who would access microcredit. It is also revealed that age of borrowers, household income, interest rates, and loan duration are key determinants affecting microcredit accessibility. In this connection, the farmers who generally closely included in these characteristics are obviously reluctant to access microcredit offered by formal banks and instead, appreciate local microfinance institution to whom the farmers closely communicate to approach source of fund, such as KUR scheme on their behalf [11].

To support MSMEs and Cooperative in shortage of funding, to create employment opportunities, and to reduce high dependency of farmers on local informal money lenders, the government have launched KUR credit scheme in 2007. This scheme has been improved several times up to its current arrangement that mostly satisfy those who are using such financial facility. However, the number of farmers who used this credit program was relatively small with several reasons, namely: (i) lack of information about the program with subsidized interest, (ii) farmers have no collateral, (iii) some farmers have principle that borrowing money from bank is a riba (usury against religion’s rules), (iv) some farmers have once rejected to borrow from the bank, (v) farmer’s fright of unable to repay, and (vi) inactive of the farmer’s groups.

Government policy during the period of 2007-2020 has encouraged the evolution of KUR to an ease direction for the farmers to access the credit. This was indicated by the reduction of KUR interest rate, the increase of ceiling level of loan, and the increased number of financial institutions involvement. Its impact during the period of 2015-2019, by and large the number of debtors, ceiling level, agreed proposal, and actual KUR distributors were all increased. Similar condition was also revealed during the period of 2017-2020 with the increase of debtor and actual loan from 1.11 million with IDR 22.62 trillion (2017) to 1.86 million with IDR 54 trillion (2020). This increase was also followed by a low NPL value, i.e., 1.19%. However, the farmer’s rate of participation when compared to the total number of farmer’s household at national level was considered as relatively low, namely 4.99% (2018) and 5.23% (2019) [12].

3.2. Rice value chain and rural financial institution for smallholding farmers
Rice farm activity will always be threatened by harvest failure because of uncertainty and natural risks, such as natural disasters or pest and disease uncontrollable attack. With lack of working capital, high risks, and instability of rice price (specifically during peak harvest time) should give adequate reason for farmers to shift to other less risk cultivation. This situation should be well encountered because if this is allowed to happen, the country may face national hardship which could easily lead to a massive social unrest. That is to show the importance of rice in social life of majority of Indonesians. Therefore, a program to coordinate rice farm business with financial support in addition to technical matters would not only to secure national food production, but also to significantly improve farmer’s welfare.

Bank Mandiri, as one of the shareholders of PT MDP, facilitates the farmers to access KUR and rice farming insurance. The farmers conduct rice farming starting from pre-planting, planting, harvest, and post harvest. Each of this rice value chain require financial services. In its business process, it shows that the farmers will sell rice (in the form of paddy) to PT MDP who acting as farmers’ rice purchaser. This company dries, mills, polishes, and packing the rice through the newly established integrated rice center (IRC). Costs of constructing IRC building and all rice milling machines were financed by Bank Mandiri using its CSR (corporate social responsibility) fund. PT MDP sells the rice to, among the partners: the wholesalers, retailers, on-line shops, hotels, restaurants, e-waroeng (the kiosks offering non-cash food aid to the lower income group), and RPK (Rumah Pangan Kita), a food network distribution for price stabilization and government’s service programs. With the machines installed at IRC, PT MDP main business is shown in Figure 1. PT MDP business model can attract investors to
place their funds in rural economic activities. The model not only helps farmers but also provides benefits and at the same time participates in helping the government in providing food for the people.

In its initiative for a better farm performance and encourage smallholding farmer’s entrepreneurship, the MDP set up a cooperation with the farmers. Awareness on the farmer’s lack of capital, a program to increase the farmer’s income and improve their welfare is envisioned. As earlier mentioned, PT MDP have introduced four business activities in line with rice value chain with farmers, namely (a) pre-planting (database/farmer’s consolidation, credit/insurance, land preparation); (b) planting (seeds, fertilizers/pest and disease eradication, mechanization tools); (c) harvesting (quality control, availability of tools, transportation), and (d) post-harvesting (production purchase, processing to rice, rice marketing). In 2020, the company’s working area cover 14 villages with total agricultural land about 13,346 ha (paddy land 2,931 ha). The number of farmers in those villages (14 Gapoktans) who participate in the cooperation is 15,634; harvested area is 5,853 hectares with cropping index of 200. Total production is 36,288.6 tons with average yield of 6.2 tons/ha. There are 11 extension workers who technically work and serve the farmers [13].

KUR scheme is the main source of fund for farmers, but mostly inaccessible. As a state-owned bank, Bank Mandiri need to increase the number of lending through the KUR scheme in a mission to support agricultural production. Therefore, in its role as supervisory institution for PT MDP, Bank Mandiri would channeling the KUR credit through PT MDP and as representative of the farmers, MDP will take responsibility in implementing such financial facility. KUR is a low interest credit available for individual or formal business institution or group of business organization that run productive businesses and worth it but have no or inadequate collateral to access commercial bank credit [14]. MSMEs and Cooperative that engaged in productive business sectors, including agriculture are expected to access this low interest rate loan financial service. The current interest rate of KUR loan is 6%/year and for rice crop would apply repayment after harvest time (5 to 6 months for one planting season). KUR credit facility could be accessed through local financial institutions or Cooperative or through linkage program such as that of with the MDP. With such terms and conditions, an income simulation of this credit could be illustrated as in Table 1.

| Figure 1. The main business of PT MDP, from paddy to premium rice. |

| Main: Dried paddy | Byproduct: Straw |
|-------------------|-----------------|
| Main: 1st grade of rice | Byproduct: Husk |
| Main: 2nd grade of rice | Byproduct: Dried paddy |
| Main: Premium rice | Byproduct: Broken rice, granots |

| Output |
|-----------------|
| Wet paddy |
| Main: Dried paddy | Byproduct: Straw |
| Main: 1st grade of rice | Byproduct: Husk |
| Main: 2nd grade of rice | Byproduct: Dried paddy |
| Main: Premium rice | Byproduct: Broken rice, granots |

| Process |
|-----------------|
| Wet paddy to dryer |
| Dried paddy is cleaned of waste (straw, etc.) and dried by a dryer until the moisture content reaches 14% |
| The dried paddy is ground to remove the outer skin |
| Boiled, grit rice grade of rice is separated from those which has not peeled off the outer skin |
| 100% of first grade rice polished to a degree of polishing 95% |
| The 95% white rice is polished and dewy until shiny |
| White and shiny rice is sorted and separated from reject rice (yellow, black, small stones) |
| Separation of rice from broken rice and granots then milling to meet premium standard |
| Premium rice into 1 kg to 1 kg packaging |

| Machine |
|-----------------|
| Truk |
| Paddy Cleaner & Dryer |
| Paddy Husker |
| Paddy separator |
| Whiten |
| Polish |
| Color Sorter |
| Rotary Shifter |
| Scaling & Packaging |

| Value Chain |
|-----------------|
| Pre-planting (database/farmer’s consolidation, credit/insurance, land preparation) |
| Planting (seeds, fertilizers/pest and disease eradication, mechanization tools) |
| Harvesting (quality control, availability of tools, transportation) |
| Post-harvesting (production purchase, processing to rice, rice marketing) |

| Table 1. Income Simulation of KUR Credit |
|-----------------|
| Income Source | Revenue | Expenses | Net Income |
| KUR Loan | 36,288.6 tons | 21,696.8 tons | 14,591.8 tons |
| Other Income | 15,634 farmers | 14 Gapoktans | 11 extension workers |

Table 1 shows the income simulation of KUR credit with PT MDP. The main source of fund for farmers is the KUR scheme, but mostly inaccessible. Therefore, PT MDP set up a cooperation with the farmers and introduced four business activities in line with rice value chain with farmers. The income simulation shows the potential of KUR credit in supporting agricultural production and improving the welfare of farmers.
Table 1. Mandiri’s KUR scheme for PT MDP’s rice crop farmers (per planting season).

| No. | Description                        | Amount (IDR) | Notes                                      |
|-----|------------------------------------|--------------|--------------------------------------------|
| 1.  | Total working capital/ha           | 12,811,000   | Incl. cost of living and insurance premium |
| 2.  | KUR credit                         | 12,811,000   | Fully support                              |
| 3.  | KUR interest (total 5 months)      | 373,654      | 6% per year                                |
|     | Total loan                         | 13,184,654   |                                            |
| 4.  | Total revenue (6,200x4,800)        | 29,760,000   | Average yield 6.2 tons/ha and average price of paddy IDR 4,800/kg |
|     | Total income                       | 16,575,346   |                                            |

The increasing trend of total purchase of PT MDP to Gapoktan as co-operator during 2018 to 2020 shows the intensive trade activities conducted by the two parties (Table 2). The increasing trend also exhibit the farmer’s active participation with highly possible that more farmers surrounding the area submit their willingness to join such cooperation. From PT MDP’s point of view, the limited available budget will be a major constraint to develop their business operations although this is still possible considering the availability of human resources and the idle capacity of the IRC.

Table 2. Purchasing trend of paddy from PT MDP to Gapoktan, 2018-2020.

| No. | Purchased items | Amount (IDR 000) | 2018 | 2019     | 2020     |
|-----|-----------------|------------------|------|----------|----------|
| 1.  | Wet paddy       | -                | 498,381 | 84,682   |
| 2.  | Dried paddy     | 356,314          | 7,118,162 | 1,704,239 |
| 3.  | Medium rice     | 342,667          | 5,509,330 | 11,540,861 |
|     | Total           | 698,981          | 13,125,873 | 13,329,782 |

The capacity of IRC could still accommodate more raw materials (wet and dried paddy, and medium rice), however, without additional working capital, PT MDP unable to reach more farmers. Therefore, with the government support, private investors are very welcome to place their capital at MDP, provide funds for farmers, and enabling larger business coverage and operations.

4. Conclusions

Farmers frequently confronted by shortage of fund to purchase adequate production inputs and meet farm level recommendation. Smallholding rice farmers require financial support but have limitation to access formal microcredit. The local micro finance institution like PT MDP has shown its capacity through their business operation for mutual benefits. The role of PT MDP in providing fund for each of rice farm value chain node is promising. Therefore, the farmers/Gapoktans are expecting the local micro finance institution to lead their farm activities and guide them to a better farm performance.

The government investment through development of rural-based micro financial institutions is strongly encouraged. Training and education to enhance the human resource capacity of micro financial institutions would be a way to empower the farmers which would also reflect efforts to participate and improve sustainable food production. The role of local government in providing regulatory framework is important to significantly stimulate economic activities. Support business network by linking the financial institutions with other organizations through economic partnerships arrangements is highly suggested. The public-private partnerships model is expected to attract more investment and help farmers to develop agribusiness activities in rural areas.
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