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The Impact Of Coffee Seed Assistance On Increasing Farmers' Income In West Java

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ABSTRAK

Benih kopi unggul bersertifikat sulit diperoleh petani, padahal benih unggul bersertifikat tersebut merupakan faktor kunci peningkatan produktivitas.Penelitian ini bertujuan untuk mengeksplorasi dampak bantuan benih unggul bersertifikat kepada kelompok tani kopi untuk meningkatkan pendapatannya. Riset ini menggunakan pendekatan kualitatif deskriptif. Populasi penelitian adalah seluruh petani kopi di Jawa Barat yang mendapat bantuan benih kopi sebanyak enam ratus enam puluh kelompok tani, dan sampelnya ditentukan enam puluh enam kelompok tani dari tiga belas kabupaten. Data didapatkan melalui wawancara, observasi, dan studi dokumentasi. Analisis data menggunakan triangulasi. Peningkatan pendapatan petani kopi diperoleh dari produksi yang dijual dalam wujud green bean, terjadi akibat dari pelaksanakan teknis budidaya yang sesuai dengan standar operasional teknis, bimbingan teknis petugas, dan penggunaan benih unggul yang bersertifikat. Penggunaan benih unggul bersertifikat kepada petani kopi dapat direplikasi menjadi model bantuan stimulant pemberdayaan petani untuk meningkatkan pendapatan dari peningkatan produksi kopi maupun wirausaha perbenihan. Dampak bantuan Benih selain terhadap peningkatan pendapatan petani, juga pada peningkatan keterampilan pelaksanaan pembenihan dan kapasitasnya meningkat menjadi produsen benih dan sebagai pemasok kebutuhan masyarakat yang lebih luas

ABSTRACT

Certified superior coffee seeds are difficult for farmers to obtain, even though certified superior seeds are a key factor in increasing productivity. This study aims to explore the impact of certified high-yielding seed assistance to coffee farmer groups to increase their income. This research uses a descriptive qualitative approach. The study population was all coffee farmers in West Java who received coffee seed assistance as many as six hundred and sixty farmer groups, and the sample was determined by sixty-six farmer groups from thirteen districts. Data were obtained through interviews, observations, and documentation studies. Data analysis using triangulation. The increase in coffee farmers' income is obtained from production sold in the form of green beans, resulting from the implementation of cultivation techniques in accordance with technical operational standards, technical guidance of officers, and the use of certified superior seeds. The use of certified superior seeds to coffee farmers can be replicated into a stimulant assistance model for empowering farmers to increase income from increasing coffee production and seed entrepreneurship. The impact of seed assistance is not only on increasing farmers' income, but also on improving hatchery implementation skills and increasing their capacity to become seed producers and suppliers of wider community needs.

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INTRODUCTION

Farmers' income increases from increased coffee productivity with the use of high-yielding seed varieties. This is in accordance with some opinions of researchers previously stated that one of the factors that can increase farmers' production and income is the use of superior seed varieties (Tenriawaru et al., 2023). Increasing farmers' income can be done by the government through increasing production using quality seeds (Ouya et al., 2023). The utilization of unique local seed varieties can attract local and international organizations to increase the socioeconomic value of farmers (Ouya et al., 2023). One alternative use of dry land in Indonesia is planting sorghum to increase farmers' income (Sahara et al., 2023). Care must be taken when using mineral fertilizers, there will be a decrease in soil structure stability with excessive application of mineral fertilizers (Peng et al., 2023). Another important point to note, that agricultural production can be optimized by calculating the trade-off of greenhouse gas emissions with nitrogen and environmental management strategies (He et al., 2023).

This is reven with the results of previous studies which stated that, the national high-yielding variety policy is the gateway to increasing the commodities sought after by farmers (Zhao et al., 2022). On the other hand, dry and cold conditions during seed development determine the color and size of the developed seeds (Snowball et al., 2022). The use of superior seeds and balanced organic fertilizers will affect rice productivity by 18.18 percent (Taufik & Ruzardi, 2021). Crop yield is positively correlated with crop area and use of superior seeds (Kusumaningsih, 2023). Gamma-ray radiation can affect the production of superior seeds that can increase productivity (Ula et al., 2023). The supply of superior seeds is a major challenge related to increasing production (Satriani et al., 2023). The technical efficiency of production can be determined by managers of education, extension, superior seeds, and cultivation (Muhardi & Effendy, 2021). A breeding program with seed gardens was carried out to obtain superior seeds from selected mother trees in Europe (Walther et al., 2022). Technical sustainability of plant breeding methods can be done by using vegetable pesticides, organic fertilizers, mentoring local extension workers, collaborating with certified seed breeders in the surrounding area, and attending training (Nurbudiati & Wulandari, 2020). The use of certified seeds, reduction of post-harvest loss, and reduction of chemical pesticides can increase farmers' production and income (Connor et al., 2021). For performance and strength certified superior seeds are required, and the highest yield losses occur in the use of non-certified seeds (Tonello et al., 2019).

The use of certified seeds can reduce production inputs such as pesticides, fertilizers, and water (Donovan et al., 2021). The main challenge of seeding is obtaining seeds from informal sources and seed insecurity is evident, this is due to the limited availability of certified high-yielding varieties (Mulesa et al., 2021). Certified seeds give higher yields in production, so it is necessary to apply national legislation and international standards (Wasilewska-Nascimento et al., 2020). Certified seeds give higher yields in production, so it is necessary to apply national legislation and international standards (Atieno et al., 2023). Certified seed and plant breeding programs are required and should be available throughout the country (Husenov et al., 2021). The quality of seed use, increased production value, and decreased production cost are determined by certified seed support from the government (Cevher & Altunkaynak, 2020). To maintain the availability and timeliness of seed needs, certified seeds are sent directly by seed companies to farmers, institutional markets, and agro-dealers (Akpo et al., 2020). Compulsory variety registration and certified seed production became the main regime in Europe which initially saw seed exchange as commercial exploitation (Batur et al., 2021).

Technical cultivation services to improve the ability of coffee farmers. To maintain yields, it is carried out with acclimatization mechanisms and some cultivation techniques, especially the application of elicitors (de Melo et al., 2022). Stable breeding material can be obtained with the collaboration of enterprises and research institutes, quinoa cultivation techniques are integrated into different ecoregions (Xiu-Shi et al., 2019). For the sustainability of cultivation, cultivar selection is a key factor for agronomic techniques to become a "Super-Efficient System" (Maldera et al., 2021). Molecular biology techniques are genetic improvement techniques in the decade 2010-2019, which previously focused on three different areas: (i) genetic techniques aimed at the study and resolution of phytosanitary problems; (ii) genetic improvement of new cultivars to obtain production quality; (iii) open field cultivation techniques to increase the quantity and quality of production, in the decade 2000-2009 (Raparelli & Lolletti, 2020). Protecting natural populations of seeds and improving mass cultivation techniques requires systematic research efforts (Vega-Villasante et al., 2021). With the development of science, substantial advances in cultivation techniques tend to continue to change and some scientists have different paradigm interpretations (Martiny, 2019). Traditional cultivation techniques can ensure the sustainability of the cultivated commodities (Sudewi et al., 2020). Proper cultivation techniques such as proper nitrogen levels and application of biostimulant substances guarantee production results with high-quality standards (Candido et al., 2020). Good cultivation techniques can affect the level of carbon emissions that occur during the photosynthesis process (Haque et al., 2020). Irrigation, water quality, cultivation techniques, fertilization, and environmental conditions determine the level of production of a crop commodity (Walczak, 2021).

Certified high-yielding seeds are obtained from seed-source gardens. The development of high-yielding varieties and the distribution of seeds to farmers to improve food security was carried out by the Ethiopian government in the 1990s through a formal seed sector development policy (Mulesa et al., 2021). Through the informal seed system in Vietnam the use of certified seeds has been passed to have an impact on reducing inputs such as pesticides, fertilizers, and water (Tin et al., 2011), and commodity harvests are saved relying on the use of such seeds (Donovan et al., 2021). Certified seeds are strong perform well, and are required for commercialization (Tonello et al., 2019). The use of high-quality, certified seeds provides higher yields in potato commodity production, in addition to adequate fertilizer application, irrigation, and cultivation (Wasilewska-Nascimento et al., 2020). The use of certified seeds can increase production, farmer income, and farmer welfare, this is viewed from a socio-economic point of view (Cevher & Altunkaynak, 2020). Fundamental to sustainable smallholder food production, the use of certified seeds has an impact on increasing efficiency and reducing waste (Baglan et al., 2020). Certified seeds need to be available across the country for sustainable development and strengthening food security (Husenov et al., 2021). In addition, achieving farmer participation regarding land tenure, planting area, soil system, certified seeds, cooperative membership, extension access, and membership in associations is very important (Rokhani et al., 2020). The results showed that the use of certified seeds, pesticide reduction, and post-harvest loss reduction is important for increasing production and farmers' income (Connor et al., 2021).

Coffee seed assistance is needed to help farmers increase productivity. The seed mentoring program is the most important activity in the production aspect of the cultivation of plantation crops (Sukiyono & Widiono, 2020). Regular seed assistance or subsidies from the government are the reasons farmers choose to use high-yielding varieties (Tenriawaru et al., 2023). To maintain national food security and nutrition as a priority, producing seeds, source seed assistance is provided to seed producers, extension assistance to farmers, farmers are

encouraged to adapt to new habits/varieties that are different from before/certified superior through the socialization of Multi-Channel Dissemination Spectrum (SDMC) (Setiani et al., 2022). Seed assistance is an important program compared to the provision of soft assistance, and expanding accessibility to production inputs to optimize household economic resources is important as a material for the design of government policies to increase the production of plantation commodities (Sukiyono & Widiono, 2020). The SO (Strengths and Opportunities) strategy is carried out by utilizing the support of the Farmer Group Association so that farmers get certified assistance, utilizing government support in channeling capital, utilizing average input prices and input availability, and utilizing market access (Manoppo et al., 2021).

Herbicides and weeding treatments affect the size of coffee grains with high commercial value, also the accumulation of dry matter in the soil has a positive effect on coffee production especially when there is a lack of rainfall but has no causal relationship to coffee productivity in the future (Zaidan et al., 2022). Gypsum treatment supports microbial activity, and soil biochemical parameters are key in the evaluation of soil use change, as they relate to coffee productivity levels (Naves et al., 2020). Arabica coffee production can be increased through better cultivation techniques with the application of organic fertilizers shad-ing, trimming, and coffee pulp-husk (Karim et al., 2021). Environmental conditions and management can determine maximum coffee productivity also with increased nitrogen doses promoting a squared increase in coffee yield (Rosado et al., 2021). The innate characteristics of coffee, which refers to the annual turnover of high and low-production fruits, are the factors that most affect coffee productivity in the biennial cycle (Santinato et al., 2019). Uganda's coffee productivity is lower than that of top producers other than Indonesia at 520,000 tons/ha (Sseremba et al., 2021). Research conducted in Manhuacu, MG, Brazil, analyzing flower tissue can diagnose coffee tree nutrients related to coffee productivity (Zabini et al., 2021). Intercropping coffee plants with mahogany supports coffee productivity even though accumulated productivity shows no treatment effect (de Freitas et al., 2023).

To maintain soil quality and coffee productivity, pruning and fertilizing practices play an important role in coffee plantations (Azizah et al., 2023). Drought and heat stress are threats to coffee productivity, quality, and volume of coffee that can be traded, to anticipate these problems can be used Coffea canephora which has high genetic diversity that can maintain coffee productivity but is not sufficiently exploited (Sseremba et al., 2023). Coffee productivity can be affected by the volume of irrigation water, the amount of working capital, labor, and the size of the farm based on the analysis of the production function using Cobb-Douglas (Tran et al., 2021). Social capital and information networks needed are key factors in the low adoption of innovative technology for Indonesian coffee farmers, this is related to the high data on coffee exports in contrast to the low productivity of national coffee (Ashadi et al., 2023). Building coffee production extension services, institutional arrangements, and access to information on coffee production technology adoption are key components of adopting coffee production technology packages for farmers as happened in Ethiopia (T, 2021). Developing healthy plants, able to defend themselves, and remain productive when attacked by pathogens should be a sustainable production approach, to the main resistant genes used for many years (Toniutti et al., 2019). There is a relationship between the socioeconomic factors of farmers and the level of technology adoption to increase coffee productivity at the farmer level (Wambua et al., 2021). The productivity and quality of coffee are determined by genetic characteristics and their interaction with the environment, as well as nutrient management (Alberto et al., 2023).

Previous research has only led to the use of seeds and productivity has not touched much direct income due to the use of certified superior seeds. This study conveys the use of certified

superior seeds with the implementation of cultivation techniques in accordance with specified operational standards and an increase in farmers' income from production and seed business.

However, there are still many farmers who utilize coffee seeds from production plantations, in addition, the knowledge and technical skills of coffee cultivation are still low, and the income of coffee farmers is still not optimal. Another crucial thing is that there are still many farmers who have not been able to get certified superior seeds.

Based on these problems, it is outlined in the following research questions: How can farmers get certified superior coffee seeds; How the impact of using these seeds on increasing the income of coffee farmers.

This research is important because smallholder incomes are caused by low coffee productivity. In addition, there are still many farmers who do not use certified superior seeds. This study aims to determine the extent to which farmers use seeds, how farmers get superior seeds, carry out cultivation techniques in accordance with operational standards, and the impact on increasing farmers' income.

Literature Review

It has been added that, previous research has only led to the use of seeds and productivity has not touched much direct income due to the use of certified superior seeds. This study conveys the use of certified superior seeds with the implementation of cultivation techniques in accordance with specified operational standards and an increase in farmers' income from production and seed business.

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RESEARCH METHODS

This study used a descriptive qualitative approach. The population in this study was all arabica coffee farmers as many as 55,717 households covering an area of 23,360 ha in West Java and the sample was 66 farmer groups who received coffee seed assistance from the West Java Provincial Government in 13 districts, namely Bandung, West Bandung, Sumedang, Garut, Cianjur, Sukabumi, Ciamis, Tasikmalaya, Kuningan, Subang, Majalengka, Bogor, and Purwakarta. The informants in this study were coffee farmers from 66 farmer groups in the 13 districts, the reason for the 13 districts was because the area was a plant center and Arabica Coffee production center in West Java. The sample is determined proportionally randomly. This research data was obtained by interview, observation, and documentation research instruments. Data analysis of this study uses triangulation of data sources, with check, recheck, and cross-check through the convergence of information from various sources/stakeholders.

RESULTS AND DISCUSSION

Based on the results of the study, the results of the discussion were obtained as described below.

Designation of Seed Aid Recipients and Lahan Candidates

The determination of prospective recipients of seed assistance and prospective locations was determined by the Head of the West Java Provincial Plantation Office after administrative and technical verification by the team formed, the team involved officers of the Provincial Plantation

Office and the District Plantation Office and their ranks who mastered the technical and administrative of farmer groups. After it is clear the data of prospective beneficiaries and the location of planting land is then administratively validated with the following criteria: Clarity of land is proven by a certificate / deed of sale and purchase / SPPT, if using government land is proven by a letter of cooperation agreement (SPKS) at least 2 ha per farmer group, group members are in the village area, have a resident card, family card, do not receive similar assistance in the same year, proposed to the Provincial Plantation Office by the District/City Plantation Office, after fulfilling all requirements, then determined by the Decree of the Head of the West Java Provincial Plantation Office regarding the determination of farmer groups receiving seed assistance.

By looking at these requirements, it can be seen that, to get seed assistance is not given casually, seed aid recipient groups have been verified and validated both technically and administratively, so that the success rate of seed assistance received by farmer groups can be predicted by looking at aspects of land suitability, and the skill level of farmers when the team confirms directly to farmer groups in the field.

Nursery Technique Guide

It should be explained here that, seeds that will be distributed or assisted to farmer groups in addition to being prepared by the government, in this case the West Java Provincial Plantation Office, are also prepared by seed breeding farmers or designated seed producers. Before hatchery, seed producers are trained through Technical Guidance (Bimtek), the main material of Bimtek includes seeding techniques, hatchery regulations including seed certification, coffee cultivation techniques, hatchery implementation schedules, and seed distribution to farmers/farmer groups/seed aid recipient institutions. The resource persons were brought from coffee commodity research institutions, namely the Industrial Crops and Spices Research Institute (Balitri) for coffee seeding material, seed origins, and planting in the field, including seeding practices in nurseries, the Directorate General of Plantations for seed regulation materials, which includes sanctions for violating seed rules such as the use of seeds of unclear origin, and the West Java Provincial Plantation Office for technical materials implementation, distribution schedule and technical distribution of aid.

With the technical guidance of seeding, farmer groups that are entrusted with seeding have the responsibility for the success of the hatchery carried out whose results are given to the beneficiary farmer groups, including farmer groups that carry out the hatchery itself, so that the person concerned really carries out the hatchery by observing the rules that have been determined at the time of technical guidance, and guarantees success its seeding.

The purpose of the training, to ensure that the implementation of hatcheries carried out by farmer groups can run well in accordance with the specified hatchery technical operational standards. Here it can be seen that, since the beginning the farmers have been involved in the seeding process, not only receiving seed assistance but knowing exactly where the seeds distributed will come from, with the intention that farmers believe in the chronology of the origin of the seeds, in addition to that there has been an empowerment of farmer groups with the hope of becoming seed entrepreneurs in the future. This is in accordance with the opinion that seed assistance is an important program compared to providing soft assistance, and expanding the accessibility of production inputs to optimize household economic resources as material for government policy design to increase plantation commodity production (Sukiyono &; Widiono, 2020).

Seeding implementation

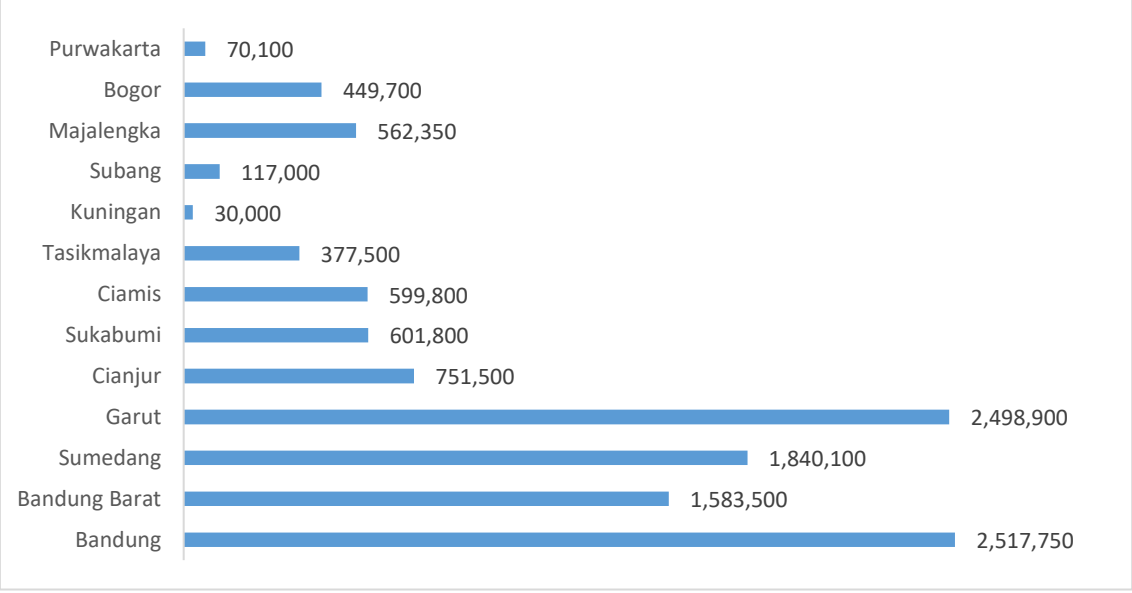
As mentioned above, the implementation of hatcheries is carried out in official gardens owned by the West Java Provincial Government managed by the West Java Provincial Plantation Office, and in farmer group gardens that have been determined with a pattern of cooperation between the West Java Provincial Plantation Office and the Head of the Farmer Group of breeders or seed producers, the location of the hatchery is around the garden of the recipient farmer group. This is done to facilitate the distribution or distribution of seed assistance to farmer groups, including to hatchery implementers who are also potential recipients of assistance. The hatchery lasts for 6-8 months from the start of seedling until it is ready for distribution or ready for distribution.

By looking at the stages of the seeding process, from starting to prepare the seedbed, making a lid, preparing the soil, putting the soil into polybags, maintenance which includes watering, weed weeding, pest control, sorting before distribution is the responsibility of seed breeders or seed producers, so it has a great responsibility for the success of seeds until they are ready for distribution. Before the seeds are distributed, seed certification is carried out, if there are seeds that do not meet the requirements for certification, it is necessary to maintain them until they are eligible to be certified.

Seed Aid Distribution

After going through the seed preparation stage and certification has been carried out, the seeds have been distributed to the beneficiary farmer groups that have been determined through the Decree of the Head of the West Java Provincial Plantation Office on behalf of the Governor. Arabica coffee seed assistance is assistance that has been distributed from 2014 to 2018 as much as 12,000,000 sticks to 660 farmer groups in 13 districts of coffee crop and production centers in West Java, as outlined in Chart 1 below.

Chart 1.
Data on Arabica Java Preanger Coffee Seed Assistance in 2014-2018

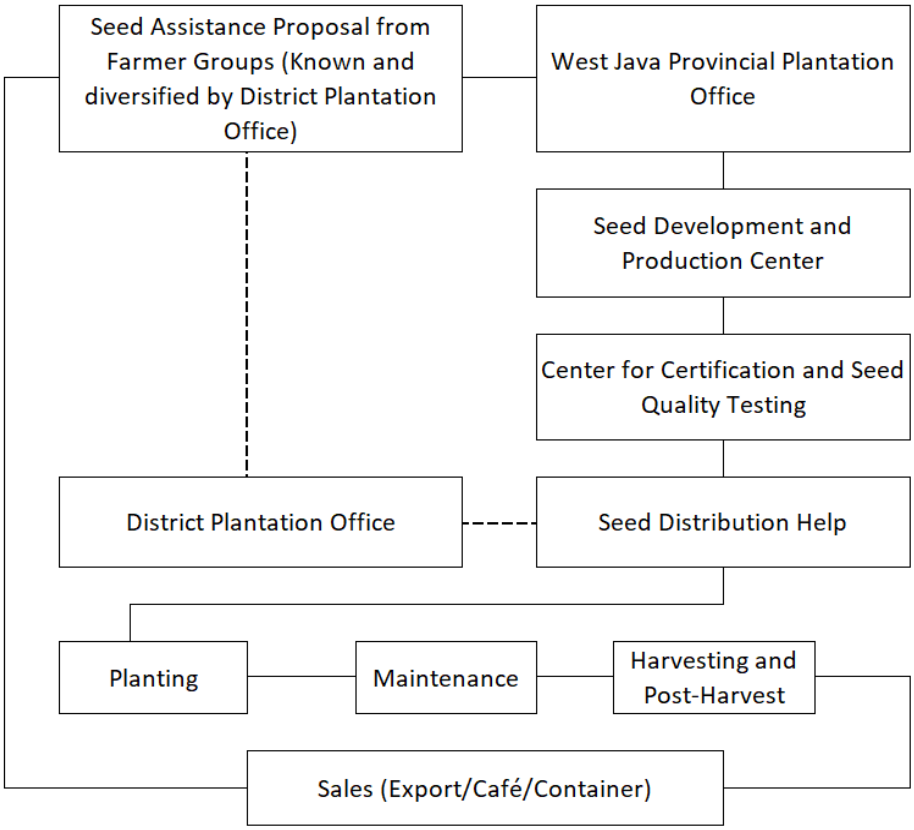


Source: West Java Provincial Plantation Office, 2023

Farmer groups receiving coffee seed assistance are carried out based on the results of a proposal study submitted by the farmer group, known or submitted by the District Plantation Office to the West Java Provincial Plantation Office, then verified and validated by the appointed team,

after all conditions are met determined through the Decree of the Head of the West Java Provincial Plantation Office on behalf of the Governor. Schematically set out in Figure 1 below.

Figure 1.
Flow Chart of Seed Aid Proposal, Planting, and Sales of West Java Preanger Arabica Coffee Production



Information:

————— = Operational line

---------- = Coordination line

Source: West Java Provincial Plantation Office, 2023

Planting, maintenance, harvesting and post-harvest

Coffee is planted on average in November and December of the year concerned after the coffee seeds are ready for planting and certified, seeds that are ready for planting are on average 6-8 months old since the coffee beans are sown. After planting, maintenance is then carried out including fertilizing, weeding weeds, and controlling pests and diseases that attack plants.

Coffee plants after 1.5 years of age begin to learn to bear fruit, and can be harvested, the implementation of harvesting is carried out selectively and gradually according to the maturity of the coffee fruit, the harvested coffee is chosen which is red or known as red picking, which is still green is left first waiting for the coffee color to turn red. After harvesting, then processing ripe coffee beans into green beans or rice coffee. There are various types of processing

harvested coffee into green beans: Wash, semi wash, honey, natural, and wine, these types of preparations are made depending on taste, and market needs.

From this description, it can be seen that, in the process of planting, maintenance, harvesting, and post-harvest is a critical phase to get the expected quantity and quality of production, therefore from the beginning it is necessary to conduct training and coaching of farmer groups to ensure that the quantity and quality of coffee production are in accordance with the standards needed by consumers.

Coffee Productivity and Farmer Income Increase from the Use of Superior Seeds

Farmer income can be measured from the level of productivity produced and the price of coffee. usually farmers' coffee productivity averages 700 kg / ha using random seeds, and many farmers still sell fresh coffee fruits without being processed first so that the selling value is low ranging from Rp. 5,000 – 10,000 / kg or Rp. 3,000,000 – 7,500,000 / ha, some sell semi-finished processed coffee or 25% grain moisture content with prices ranging from Rp. 20,000 – 24,000 / kg or Rp. 14,000,000 – 16,800,000 / ha, and green bean coffee with a moisture content of 9-13% with prices ranging from Rp60,000 – 85,000/kg or Rp42,000,000 – 59,500,000/ha, in 100 kg of fresh coffee produces 12-15 kg of green beans (yield 12-15%). After farmers use superior and certified coffee seeds, trained in cultivation techniques with operational technical standards such as the use of balanced fertilizers, integrated pest control, and harvesting red or mature picks, there is an increase in coffee productivity to 1,800 kg/ha (38.88%) and an increase in farmer income from Rp. 59,500,000/ha to Rp. 153,000,000/ha/year (63.63%)

From the description above, it can be seen that, initially farmers planted coffee seeds originating from uncertified production gardens so that productivity was low on average 700 kg / ha, after using certified superior seeds, coffee productivity increased to 1,800 kg / ha, in addition because it had been fostered from seeding to post-harvest, farmers no longer sold fresh coffee directly from the garden but processed into green beans, coffee productivity increased by 38.88% and income Farmers also increased by 63.63%.

However, there are still many farmers who use coffee seeds from production plantations

The use of coffee seeds from production gardens still occurs in the field, because several causes include farmers do not know the exact impact of using these original seeds, other causes of farmers cannot have certified superior seeds, the negative impact of plant stamina is not strong, infertile growth, susceptible to pests, and eventually death. Alternative solutions that have been applied in West Java include technical guidance since seeding, planting, maintenance, harvesting, and post-harvest or processing techniques to coffee farmers, to provide superior coffee seeds, Arabica coffee seed source gardens have been built owned by the Regional Government in Sumedang Regency covering an area of 1 ha, and in Bandung Regency covering an area of 2 ha owned by farmers, as well as a certified superior seed assistance program from the West Java Provincial Government and the Ministry of Agriculture through the Directorate General of Plantations. This is in accordance with Cevher's statement that, the quality of seed use, increased production value, and decreased production costs are determined by certified seed support from the government (Cevher &; Altunkaynak, 2020).

Based on this, in West Java a superior seed assistance program for Java Preanger arabica coffee has been developed for coffee farmer groups in an effort to increase productivity, and at the same time can increase the income of coffee farmers from the sale of processed coffee at least into green beans.

Farmers' coffee productivity is still substandard

The potential productivity of arabica coffee plants is between 0.7 – 2.5 tons / ha, with a plant population of 2,500 trees / ha (Sunanto, Salim, 2019).However, the reality in the field based on the results of interviews, the coffee productivity of farmers is still 700 kg / ha, among others, this is caused by the use of seeds originating from their own production gardens or from other farmers whose origin is not superior and of unclear origin or not legal, not fertilized, attacked by pests, diseases, and plants are not maintained.

This condition is a challenge for the government which has the function of developing plantation sub-sectors in the regions to provide guidance to farmers. Solutions that have been carried out by the government through the local Provincial and District Plantation Offices through continuous technical guidance, dissemination of technical information on cultivation with predetermined technical standard operating procedures, including the use of certified superior seeds, good technical implementation of cultivation in plant maintenance, pest control with the implementation of integrated pest control (IPM), implementation of harvesting with red picks.

Technical knowledge and skills in coffee cultivation are still low

The knowledge and skills of farmers regarding the technical cultivation of coffee in the field still vary, the current condition is still 40% of farmers do not understand the technical application of fertilizer, the dose and type of fertilizer that must be given, environmentally friendly pest control, choosing good and correct seeds.

These conditions are caused by the level of knowledge and skills of farmers still vary, there are farmers who have become accustomed to doing coffee cultivation well such as the use of balanced fertilizers but there are also those who still do not fertilize at all, even plants are left as they are with shrubs that are more dominant than maintained plants, so the level of production is low.

Alternative solutions to solve this problem include the assistance of extension officers, garden officers at the Plantation Plant Seed Production and Development Center, Seed Certification and Quality Testing Center officers, and officers of the Plantation Protection Center Implementation Unit. These officers integrally facilitate training or technical guidance on coffee cultivation, and how to obtain certified superior seeds. Technical guidance is carried out directly in the garden or at the Unit Office of the Implementing Unit of the Plantation Protection Center in the district such as training on making biological agents for coffee fruit borer pest control materials, so that farmers' knowledge and skills from time to time continue to develop in a better direction in the implementation of crop management until it produces coffee productivity reaching 1,800 kg per ha which previously only reached 700 kg per ha.

Coffee farmers' income is still low

It is still found that coffee that is ready to harvest has been mortgaged to the container at a very cheap price of Rp. 5,000 per kg, this is because farmers really need money for their daily needs and only rely on coffee plantation businesses. This condition occurs in remote areas of villages that are relatively far away, there is no information from other farmers, not reached by field officers.

The solution taken for this condition is the efforts of the nearest village government to ask field extension workers to provide knowledge about the sale of farmers' coffee products and facilitate with village funds to buy these farmers' products, then appointed a farmer coordinator by the village through the results of an agreement at a farmer meeting at the location or at the village

office, minimal coffee processing to green beans with the facilitation of coffee peelers (pulpers) and drying tools (tarpaulins), By selling Greean Bean, the price of coffee increases between Rp. 80,000 to 150,000 per kg depending on the type of coffee processing used.

There are still many farmers who have not been able to obtain certified superior seeds

Certified superior coffee seeds are obtained from certified seed source gardens as well, Arabica coffee seed source gardens that have been certified in West Java only in Bandung Regency 2 ha owned by coffee farmers and in Sumedang 1 ha owned by the West Java Provincial Government managed by the West Java Provincial Plantation Office, not comparable to the needs of planting Arabica Coffee which is 23,360 ha with a total of 55,717 farmers (West Java Provincial Plantation Office, 2022) which requires approximately 35,040,000 seeds excluding the Perhutani area of approximately 80,000 ha which can be planted with coffee on the sidelines of commodities cultivated in the Perum Perhutani area which requires approximately 40,000,000 seeds, so the number of seed shortages is 83,040,000 stems to meet the needs of coffee cultivation in West Java, in addition to the price of certified superior seeds of IDR 2,500 per stem, so it costs Rp207,600,000.00 for the needs of procuring coffee seeds in West Java

Alternative solutions to overcome this problem include building seed centers in farmer groups independently, urging seed producers to invest in hatcheries, the government facilitating the assistance of certified coffee superior seeds both the central, provincial and district governments.

CONCLUSIONS

The use of superior coffee seeds increased coffee productivity by 38.88%, and increased farmers' income by 63.63%. In addition to the use of certified superior seeds, increasing coffee productivity is also determined by the technical implementation of coffee cultivation in accordance with standard operating procedures, and increased income is obtained from the sale of processed coffee products in the form of green beans, in addition to farmer groups have the potential to become entrepreneurs in the nursery sector. As a recommendation, the seed self-management assistance program in collaboration with farmer groups becomes a local government policy for community empowerment in the field of seeds which become the livelihood of daily life.

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