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LIVELIHOOD STRATEGIES AND LIVELIHOOD SYSTEM OF DRYLAND FARMERS

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ABSTRACT

Drylands have the potential to increase agricultural production, but their condition is critical and farmers are generally weak in capital. Environmentally damaging practices and low adoption of technology reduce income. Farmers need to think rationally and use agricultural development capital for livelihood strategies. The determination of the number of samples was done using proportional simple random sampling, as many as 44 farmers from Parung Village and 59 farmers from Cikupa Village, so that the total number of samples was 103 people. The research was conducted from May to July 2023. Farmers' livelihood strategies were analyzed by the income and expenditure structure of farmer households and the purchasing power of farmers. Meanwhile, the farmer's livelihood system was analyzed descriptively in relation to the farmer's access to natural resource capital, economic capital, social capital, human capital and physical capital. The results of the study indicate that the strategy for fulfilling the needs of farmer households is carried out by seeking income from agriculture and non-agriculture. The average income of farmers from farming is IDR 17,793,227.18 per year and from non-agriculture the average is IDR 3,893,689.32 per year, so that the average income of farmer families per year is IDR 21,686,916.50. The average expenditure of farmers is IDR 16,590,417.48 per year with details of IDR 8,909,495.15 per year for farming and IDR 7,680,922.33 per year for non-agriculture. Meanwhile, the results of the descriptive analysis show that capital factors are needed to support the farmer's life system through the management of sustainable Integrated Plantation Polyculture Farming (IPPF). As many as 88.36 percent of respondents agreed and strongly agreed that natural capital is capital that supports the livelihood system of farmers through sustainable IPPF. Thus, the physical condition of the environment in dry land areas must be maintained so that its carrying capacity does not decrease, and if possible, it needs to be improved again because it is the mainstay in the search for a living and livelihood of dry land farmers.

Keywords*: Dry land, Farmers, Livelihood Strategies, Livelihood System*

BACKGROUND

Dry land in Indonesia is a capital or resource that has a great opportunity to be used in efforts to develop and increase agricultural production, especially food. These resources or capital are in the form of biological diversity and resources in the form of large tracts of land related to dry land natural resources which have a comparative advantage which can be increased using science and technology, as well as good management. In this regard, dry land is also a resource that has great potential for

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strengthening self-sufficiency in food and for other agricultural developments such as horticulture, plantations and animal husbandry (Idjudin and Marwanto, 2008).

Abdurachman, et. al. (2008) Indonesia's land area is approximately 188.20 million ha, consisting of 148 million ha of dry land (78%) and 40.20 million ha of wetlands (22%). Thus the current and future development of dryland agriculture is a strategic choice to face the challenge of increasing food production to support the national food security program. This is supported by the statement who explained that currently dry land has an increasingly strategic meaning because: (a) the continued increase in demand for food and other agricultural products, (b) the increasingly limited paddy fields due to the large number of conversions to the use of paddy fields for other development needs, and (c) there is still an increasing number of new workforce entering the agricultural sector due to limited job opportunities outside the agricultural sector, and (d) the consequences of the development itself (Suwarto, et. al., 2012)

Rachmat (2013) said that the distribution of dry land in Indonesia, West Java Province has a dry land area of 1.535 million ha and as much as 61.97 percent of the land area is agricultural area. West Java's dry land is 55.98 percent in the southern region, 34.50 percent in the central region and only 9.52 percent in the northern region. From the southern region, it turns out that Tasikmalaya Regency is the region that has the third largest dry land area in West Java, reaching 11.10 percent after Sukabumi (15.11 percent) and Cianjur (11.28 percent).

The largest use of dry land in agricultural cultivation is utilization in the plantation sector, both private, state and community plantations where the area reaches 13.4 million ha, then 18.5 million ha for dry land/gardens (Central Bureau of Statistics, 2010). Tasikmalaya Regency based on Government Regulation No. 2 of 2005 concerning RTRW explains that the southern region of Tasikmalaya Regency has the potential for dry land for the development of plantation crops. Based on data from Tasikmalaya Forestry and Plantation Service, the plantation business is dominated by plantations owned by the community or farmers who cultivate various plantation crops. Coconut is a plantation commodity with the largest land area and production, followed by tea, clove, sugar palm and coffee. The management and utilization of dry land in West Java province including Tasikmalaya Regency is still not optimal. Even if it is managed incorrectly, it can cause landslides.

Scott (1989) in Sugihardjo (2012) stated that with the great need for life, it encourages farmers to behave as survival farmers in order to meet their needs. Macro social changes, including the industrialization process that has touched the lives of rural communities, have provided very few choices of livelihood sources for farmers in the village. The economic activities (livelihoods) that are built also do not provide adequate economic appreciation and social honor so that farmers often have to make livelihood maneuvers, including those carried out by the Tasikmalaya Regency community, namely with a mixed planting system (polyculture) which cultivates various types of plants (even livestock and/or fish) on one plot of land. In this system, the mixture of trees, both types of trees, planting distances and their distribution are very irregular, known as simple agroforestry or agroforestry or also called agroforest. In connection with this, research on livelihood strategies and farmer livelihood systems is important to be carried out to get a picture of how farmer households respond to the conditions or situations they experience.

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RESEARCH METHODS

The research method used is a survey. Survey research is research carried out by determining samples taken from the population using a list of questions or questionnaires as a data collection tool. This research takes the object under study are farmers who do farming on dry land in the form of polyculture/agroforestry farming which cultivate mixed crops consisting of food crops, estate crops, forestry crops, and integrated livestock farming. Respondent farmers have a variety of cultivated plants that differ from one another depending on the preferences of each farmer household (Singarimbun, 2006).

The research took place in South Tasikmalaya Regency, based on Government Regulation No. 2 of 2005 concerning spatial plans, states that Tasikmalaya Regency is divided into 3 development areas, namely the North, Central and South regions. The southern region has the potential of dry land for the development of dry land farming through the management of polyculture/agroforestry farming.

The research was conducted in two selected sub-districts, then from each sub-district one village was taken purposively, namely Parung Village, Cibalong District and Cikupa Village, Karangnunggal District, both of which are included in the Tasikmalaya Regency, south of West Java. This research location was chosen because the dry land conditions are the most extreme, many farmers stop their farming and then leave the village to look for work in the city.

The population in this study were dry land farmers who cultivate agroforestry farming which cultivate mixed crops consisting of food crops, plantation crops, horticultural crops and forestry crops as well as sheep/goat livestock. From the results of the preliminary survey it was found that there were 1,569 dry land farmers in Parung village and 2,115 dry land farmers in Cikupa Village so that the population in this study was 3,684 people. Referring to the Slovin sampling criteria, it was determined that the required sample size was 103 people. Then, proportional simple random sampling was taken, so that from each village, 44 farmers from Parung Village and 59 farmers from Cikupa Village were selected. Data analysis for farmer characteristics and IPPF diversity were analyzed descriptively by explaining, describing, describing the variables studied. The livelihood strategy instrument used to measure the way farmer families implement a combination of livelihood strategy options to meet their family needs is to analyze the income and expenditure structure of farmer households and the contribution of each income source to total family income, so that farmers' income sources can be identified as a representation of the livelihood strategy. farmers to meet the needs of farmers and their families.

Farmer Household Income Structure (FHIS), Farmer Household Expenditure Structure (FHES) and Farmer Household Purchasing Power (FHPP) are calculated using the following formula.

1) Farmer Household Income Structure (FHIS)

The structure of farmer household income shows the source of income for the farming family and the contribution of each sub-sector that forms the total amount of farmer household income. The structure of farmer household income is formulated below (Nurmanaf, 2006):

$ASRS = \sum (TIAS/\sum FHTI) \times 100\%$

Information :

ASRS = Agriculture Sector Revenue Share (%)
TIAS = Total Income from the Agricultural Sector (Rp/year)
FHTI = Farmer Household Total Income (Rp/year)

2) Farmer Household Expenditure Structure (FHES)

Farmers' livelihood strategies are also seen from the results of an analysis of the structure of expenditure or household food consumption. The larger share of spending on food indicates that

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household income is still concentrated on meeting basic needs. On the other hand, the larger share of expenditure in the secondary (non-food) sector indicates that there has been a shift in the position of farmers from subsistence to commercial. The share of expenditure on food is calculated by the formula:

$SEF = \sum (EF/\sum FHTE) \times 100\%$

Information :
SEF = Share of Expenditure on Food (%)
EF = Expenditure on Food (Rp/year)
FHTE = Farmer Household Total Expenditure (Rp/year)

3) Farmer Household Purchasing Power (FHPP)

The higher the purchasing power of households, indicating the ability of farmers to meet their needs which characterizes the success of farmers' livelihood strategies and vice versa. The performance of the level of purchasing power of farmers with the main source of income from the agricultural sector, is calculated by the as follows (Sudana, 2007):

$FHPP = FHTI/(FHTE – CoF)$

Information :
FHPP = Farmer Households Purchasing Power
FHTI = Farmer Household Total Income (Rp/year)
FHTE = Farmer Household Total Expenditure (Rp/year)
CoF = Cost of Farming.

Analysis of the level of purchasing power used can show whether the farming family is able to meet the needs of the family both for consumption and for the needs of their farming business. The purchasing power value obtained can be interpreted as follows: 1) If the purchasing power value is less than 1 (FHPP < 1) it indicates that the farming family is unable to meet all of its expenses, 2) If the purchasing power value is equal to 1 (FHPP = 1) it indicates that the farming family has been able to meet all of its expenditures both for consumption and farming capital, but the family has not been able to save or invest to expand its business, 3) If the purchasing power value is more than 1 (FHPP> 1) indicates that the farming family is able to meet all of its expenses and also the potential to save or invest.

RESULT AND DISCUSSION

In an effort to understand more deeply related to livelihood strategies and farmers' livelihood systems, this study also presented the identity of the farmers who were respondents. The identity of the respondent farmers was examined from the aspects of age, marital status, family dependents. formal education, counseling attended, main occupation, area of cultivated land and status of land tenure. The characteristics of the respondent farmers will be related to the socio-economic conditions and decision-making in the farmer's household.

From the results of data collection it is known that the youngest respondent's age is 31 years old, the oldest is 67 years old with an average age of 49 years. This shows that the respondent farmers are generally of productive age, which is expected to contribute to increasing the productivity of the UTPPT they are engaged in. Of their marital status, 2.9 percent were single, 1 percent were widowers, and the rest were married (96.1 percent). Most of the dependents of the farming families are 7 people with an average family dependent of 2.6 people and there are farmers who do not have family dependents because they are not married or because their sons and daughters are married so they are no longer the responsibility of the respondent farmers to make ends meet.

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The education level of farmers is dominated by elementary school level (> 50 percent) and related to training, most of the farmers have attended counseling. Extension is very important to be followed by farmers to increase farming knowledge and skills. The work of farmers is dominated by farmers who make a living as farmers as well as breeders. The average farming experience is 16.4 years. The average cultivated land area is 0.614 ha, the average IPPF land area is 0.41 ha. Land tenure status is generally owned land (> 90 percent) so that farmers have full management rights over the land they cultivate. Farming carried out by farmers is Integrated Plantation Polyculture Farming (IPPF). This farming is a farming model that has unique characteristics because it cultivates several different crops on the same land. Some of the plants cultivated by farmers on their IPPF land are a combination of timber plants - plantation crops - horticultural crops - poultry; timber plants - estate crops - horticultural crops - small ruminants; plantation crops – horticultural crops – small ruminants; plantation crops – horticultural crops – poultry – small ruminants; woody plants – food crops – horticultural crops – small ruminants, and others.

When agricultural land is planted with various types of plants, there will be interactions between the plants planted. These interactions can be mutually beneficial (cooperation) or mutually inhibiting (competition). Therefore, in the polyculture cropping pattern, aspects of technical culture that need attention are spacing, plant population, age of each plant, and plant architecture as well as plant morphology and physiology. Rachmat (2013) stated that a good integrated farming pattern should consist of components of annual crops, perennial crops and livestock. This is technically appropriate for farming with conservation principles that maintain and improve the fertility and environment of farming and is economically appropriate to avoid risks caused by production failure and the price of a commodity. The types of commodities cultivated by respondent farmers on IPPF land are very diverse so that the types of products produced are also very varied. The planting pattern carried out on one IPPF land unit can be carried out at the same time or at different times (sequentially) involving forestry plants, plantation crops, horticultural crops and annual crops as well as livestock.

Polyculture farming is useful for increasing farmers' income, as well as being able to maintain and improve the environment and has an important economic function for society, because this system is based on a diversity of structures and elements that are not concentrated on just one species (Irianto, 2010). The components of annual crops, annual crops and livestock are technically suitable for integrated farming with conservation principles that maintain and improve fertility and the farming environment and are economically appropriate to avoid risks caused by production failures and the price of a commodity (Rachmat, 2013). This farming is carried out by farmers because farmers face demands to be able to meet the needs of their families while their land is categorized as narrow land, so farmers always try to optimize the use of their land through IPPF. Cultivation of plants in a polyculture pattern involving forestry crops, plantation crops, horticultural crops and seasonal crops as well as livestock business, the planting time is either the same or different (sequential). Farmers plant their IPPF land with annual crops and between annual crops cultivate seasonal crops and conduct livestock business. This causes the types of products and the age of the plants cultivated by farmers on IPPF land to be very diverse, including the types of products and harvest times that vary and are sequential.

In this regard, the IPPF model is a farming model that allows for the spread of activities or farming activities that occur throughout the year (land processing, seeding, planting, fertilizing, pest control, pruning, etc.) including different harvest times starting from weekly, biweekly, monthly, and seasonally, annually and at any time so that production results are optimal. The diversity of product types and different harvest times allows the use of products to be more diverse. Products produced from IPPF are not only used for subsistence interests, social or communal and commercial interests are also used to fulfill environmental services, including the production of bananas, used to meet subsistence consumption needs in the form of meeting the food needs of farmers and families, social or communal needs are used as gifts or delivery when visiting extended family or neighbors who are

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sick or having celebrations, commercial interests in the form of banana products being sold to collectors/middlemen who can go to farmers' locations, as products for environmental services in the form of green expanses of banana plants cultivated by respondent farmers which creates coolness and environmental comfort.

The area of IPPF land cultivated by respondents is not directly proportional to the number of types/types of agricultural crop commodities cultivated, in the sense that the wider the area of land cultivated the more varied the agricultural crop commodities planted, and vice versa. One of the specific characteristics of dry land farming is the management of land resources carried out by farmers. Dryland farmers generally manage their agricultural land with management practices and efficient land use as an effort to ensure economic viability, household food security, and reduce the risk of crop failure and climate change mitigation. Furthermore, if viewed from a household economic perspective, the choice of land use is influenced by the rationality of farmers (Mariyanto, et. al, 2015).

The choice of land use in farming is closely related to farmer decisions regarding actual land use. This is influenced by the rationality of farmers which among others is influenced by various objectives, among others, to ensure household food security; guarantee cash income/income to meet needs; minimizing risk, maximizing leisure related to time allocation, guaranteeing that family members are in good condition and prosperous, and to reach a certain social class in their community (Kokoye, 2013).

The results of further investigation revealed that the coconut plant is a type of plant that exists in almost all IPPF land cultivated by farmers. Coconut plants function as shade trees for the main plantation crops, namely cocoa and coffee. The polyculture of coconut, cocoa and coffee plantations has the opportunity to be integrated with small ruminant livestock businesses with respect to the leaves, fruit peels of cocoa and coffee plants that can be used as a source of feed for ruminants and ruminants produce animal waste and leftover feed which have the opportunity to be used as a source of raw material. raw materials for the manufacture of organic fertilizers to support the growth and development of plantation polyculture crops. Meanwhile, other crops are intercrops that farmers try to grow to increase their source of income and reduce the risk of failure.

Livelihood Strategy

The Livelihood Strategy is used to find out the economic life of farming families in rural areas which is not only seen from income and farming activities but is also used to understand more deeply related to the lives of farming families, the priorities of farmer's life including the efforts of farmers to survive. In an effort to understand the strategic choices made by farming households regarding the relationship between access to resources and activities that are influenced by ecological and social systems, a study was carried out related to the pattern of livelihood strategies (Rachmat, 2013). Farmer and family livelihood strategies are analyzed from the aspect of farmer income structure, farm household/family expenditure structure and farmer family purchasing power, with a description as follows:

Farmer Income Structure

Farmers' income comes from farming income and non-agricultural sector income. Income from the agricultural sector dominates household income or farmer families (82.05 percent), while non-agricultural income only reaches 17.95 percent. Thus farmers still rely on their family's main source of income from the agricultural sector. Farmer family income per year is IDR 21,686,916.50 or IDR 1,807,243.03 per month. When compared to the Regional Minimum Wage (RMW) for the regency and city of Tasikmalaya per month, which is Rp. 2,499,954 and Rp. 2,533,341, the farmer's family income is still below the RMW.

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Table 1. Sources and Income of Farmers and Families per Year

No	Source of Income	Amount (IDR)	%
1.	Income from Farming	17,793,227.18	82.05
2.	Income from the Non-Agricultural Sector	3,893,689.32	17.95
3.	Farmer Family Total Income	21,686,916.50	100.00

Source: Primary data processed, 2023.

Thus the income of farming families is still low even though farmers have received additional income from the non-agricultural sector. Farmers have tried to increase their farming income by carrying out polyculture farming, namely cultivating their land simultaneously with various types of cultivated plants, both woody plants, plantation crops, food crops, including horticultural crops. This is in line with Yusuf's research (2024) that small farmers with limited access will seek other sources of income outside the main agricultural land (on-farm) to meet their household needs.The conditions of the gardens cultivated by farmers are as shown in Figure 1.

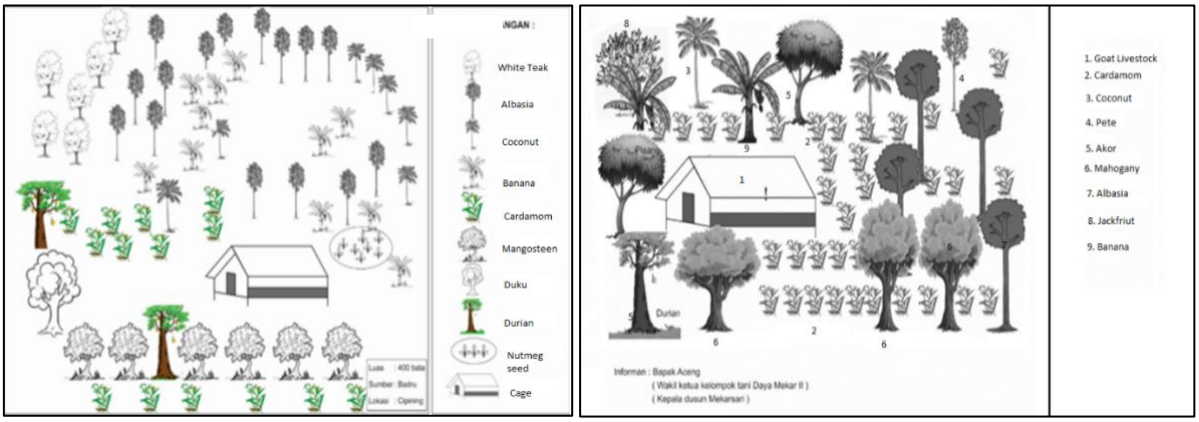

Figure 1. Gardens Sketches of Parung Village (left) and Cikupa Village (right)

From Figure 1 it can be seen that farmers in one garden area cultivate woody plants in the form of albasia and white teak, then also plant plantation crops in the form of coconut, cardamom, and nutmeg seeds, fruit trees in the form of banana, mangosteen, duku and durian. On this land, farmers also cultivate livestock and livestock pens are located in the garden area. The condition of the land planted with various types of plants with very varied plant ages allows farmers to harvest more continuously.

The application of polyculture to meet needs and increase income is highly recommended to farmers because this cropping pattern increases the diversity of vegetation which plays a very important role in increasing optimal and sustainable land productivity (Nurinda, 2006). Furthermore, that in order to maximize production with low external input and minimize risks and conserve natural resources, the dual farming system is very suitable for farmers with narrow land in the tropics. Intercropping patterns can increase the variety and amount of production per unit area per unit time, can reduce the risk of crop failure, increase the productivity of land use, time and available resources during one planting season, produce a total output in high economic significance (Beets, 1982).

Farmer Household Expenditure Structure

In an effort to understand the farmer's livelihood strategy, it is also discussed regarding the expenditure/consumption structure of the farmer's family. From Table 2 it can be seen that the total income of the farming household is still greater than the total expenditure of the farming family, even just from the income of the agricultural business, the farmer is able to meet the needs of his family even though the income from the agricultural business is almost close to the expenditure of the

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farming household. Income from non-agricultural businesses increases the ability of farmers to continue to be able to meet the needs of their families.

Table 2. Income and Expenditure Structure of the Farmer Household per Year

No	Description	Total (IDR)
A	Farmer Household Income	
	a) Agriculture	17,793,227.18
	b) Non Agriculture	3,893,689.32
	Farmer Household Total Income	21,686,916.50
B	Farmer Household Expenditure	
	a) Expenditure for agricultural business	8,909,495.15
	b) Expenditures for non-agricultural businesses	7,680,922.33
	Farmer Household Total Expenditures	16,590,417.48

Source: Primary Data Processed, Year 2023.

In this regard, even though the income of the farming family when compared to the UMR of the City and Tasikmalaya Regency is still lower, this income is still higher than the expenditure of the farming family. This is because farmers will always try to act rationally in making various adjustments to the conditions they face.

Farmer rationality is a moral economic problem for farmers who have to struggle to live on the subsistence boundary. Farmers will always use the concept of prioritizing safety as an option, when faced with taking risks, and that choice is a rational choice (Scott, 1983).

Furthermore, in an effort to determine the success of rural development, it is also examined related to the Share of Expenditures on Food (SEF). The greater value of SEF indicates that household income is still intended to meet basic needs, namely food, while the greater Share of Expenditure for the Non-Food (SENF) indicates that there has been a shift in the position of farmers from subsistence to commercial orientation in the sense that basic needs in the form of food have been met so that excess income is intended to meet other needs such as education, health and other needs.

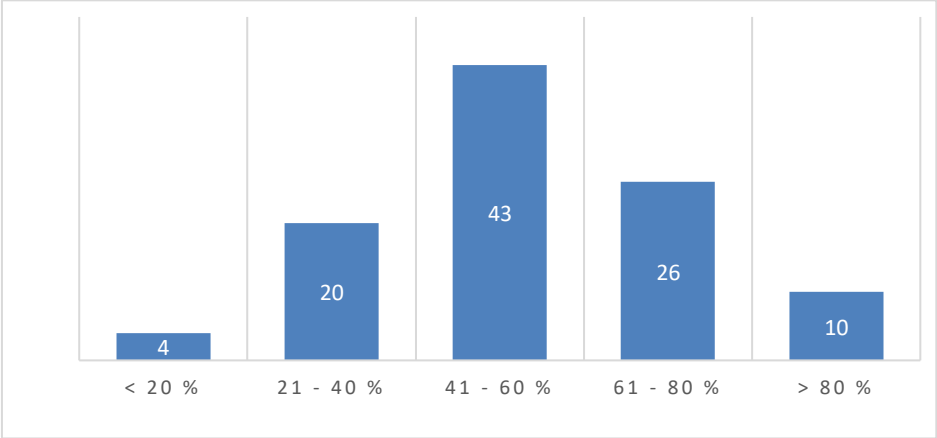

Figure 2. Share of Expenditure on Food (SEF) from Farmer Household Total Expenditures

This share of food expenditure can be used as a measure of food security (Pakpahan, 1993). Food security has a negative relationship with the share of expenditure, the greater share of household expenditure on food means that food security of the household is lower. The limit that is generally used is 60 percent of food expenditure, greater than 60 percent indicates household food insecurity. From Figure 2 it can be seen that 36 percent of farming household have food expenditures of more than 60 percent of the total houeshold expenditure and thus are categorized as food insecure. This

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shows that with the limited income received by farmers, farmers prioritize meeting their daily food needs to meet their family needs and reduce or limit expenses for other family interests (such as education, health, etc.). However, the rest already have food expenditure of less than 60 percent of the total family expenditure and thus are categorized as food secure.

Farmer Household Purchasing Power

The results of the analysis of the level of purchasing power of farming families can be seen in Table 3. From Table 3 it can be seen that all farming household have a purchasing power value of > 1. This indicates that have good purchasing power in the sense that they are able to fulfill all their expenditures both for consumption as well as farming capital, even able to save as an effort to meet the needs of other families.

Table 3 : Farmer Household Purchasing Power

Proportion	FHPP (%)
< 1.00	0.00
1.00	0.00
>1.00	100.00
Total	100.00

Source: Primary Data Processed, Year 2023

Table 3 also shows that there are no farmers whose purchasing power value is < 1.00. From the results of the analysis it is known that the lowest purchasing value of the respondent farmers is 1.2 and the highest is 29.6 with an average purchasing power of farmers of 4.3. This shows that all the farming household who were the respondents were able to meet their expenses. From the data obtained there are farmers whose purchasing power reaches a value of 29.6 far above the average purchasing power of other farmers which reaches 4.3. Furthermore, a search was carried out on the results of the analysis and it was found that respondents with a purchasing power level of 29.6 were respondents who besides having a livelihood as farmers also had livelihoods as entrepreneurs and livelihoods as farmers were as a side livelihood with their main livelihood being entrepreneurs.

Farmer Livelihood System

The farmer's livelihood system is an integration of abilities, assets and activities to achieve a sustainable life. Several research results show that farmers are very dynamic, diverse, and have different responses in dealing with various changes in both development policies and socio-ecological conditions. This response will move and "play" the resources or capital owned in the form of natural capital, physical capital, human resources capital, financial capital, and social capital which can be in the form of tangible *and* intangible *assets* (Chambers and Conway, 1991). Most rural households cannot avoid risks either caused by humans or due to environmental factors [24].

From the data in Table 4 it can be seen that an average of 79.47 percent of respondents agreed and strongly agreed that capital consisting of natural capital, economic capital, socio-cultural capital, human resources capital and physical/infrastructure capital is capital needed to support life systems farmers through IPPF management to be sustainable. Natural capital was the best responded by farmers, namely as many as 88.36 percent of respondents agreed and strongly agreed that natural capital is capital that supports farmers' livelihood systems through sustainable IPPF. Meanwhile, economic capital was the capital that received the lowest response from farmers, namely only around 70.10 percent who agreed and strongly agreed that economic capital is capital that supports farmers' livelihood systems through sustainable IPPF management.

The high response of farmers to natural capital shows the importance of the existence of natural resources so that farmers can implement IPPF so that it is sustainable to support farmers'

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livelihood systems. Natural resource capital is one of the key factors influencing the success of agricultural development including in implementing IPPF (Pasandaran, et. al., 2011).

Table 4. Supporting Capital for Farmers' Livelihood Systems

No	Description	Strongly agree	Agree	Simply Agree	Disagree	Strongly Disagree	Total
				(%)			
1	Natural Capital	14.70	73.66	10.30	0.86	0.46	100.00
2	Economic Capital	10.20	59.90	28.60	7.30	1.10	100.00
3	Socio-Cultural Capital	13.23	69.85	15.40	4.58	0.08	100.00
4	Human Resources	19.60	64.60	14.00	1.20	1.50	100.00
5	Capital Physical capital/Infrastructure	6.50	65.10	23.50	4.70	0.30	100.00
	Total	64.23	333.11	91.80	18.64	3.44	500.00
	Average	12.85	66.62	18.36	3.73	0.69	100.00

Source: Primary Data Processed, Year 2023

Furthermore, the capital that responds the lowest by farmers is economic capital. This is related to IPPF which is a farming business that requires high initial costs to benefit from the integration of resources or capital. Poor farmers are unable to invest more capital for the initial investment due to the need for agricultural produce to meet food, school, health and loan repayments (Thamrongwarangkul, 2001).

Natural Capital

Natural capital is all natural potential that can be used or exploited to support farmers' livelihood systems. Natural assets are very useful natural resources because they can be used and affect livelihood systems. The assets that farmers can access from natural capital include soil/land conditions, water, vegetation, nutrients, and forage. The results of the analysis of natural capital in supporting farmers' livelihood systems can be seen in Table 5.

Table 5. Natural Capital as a Support for Farmers' Livelihood Systems

No	Description	Strongly agree	Agree	Simply Agree	Disagree	Strongly Disagree	Total
				(%)			
1	Land/ Land	16.5	77.7	4.1	1.0	0.8	100.0
2	Water	10.4	75.4	13.2	1.0	0.0	100.0
3	Vegetation	11.3	72.5	15.5	0.6	0.0	100.0
4	Livestock Waste	16.2	73.8	9.7	0.3	0.0	100.0
5	Forage	19.1	68.9	9.0	1.4	1.5	100.0
	Total	73.5	368.3	51.5	4.3	2.3	73.5
	Average	14.7	73.66	10.3	0.86	0.46	14.7

Source: Primary Data Processed, Year 2023

From the data in Table 5 it can be seen that an average of 88.36 percent of respondents agreed and strongly agreed that natural capital consisting of land/land, water, vegetation, livestock waste and forage is natural capital that supports farmers' life systems through sustainable IPPF management . All dimensions of natural capital were responded well by farmers, namely all of them were above 80 percent of respondents who agreed and strongly agreed that natural capital is a supporting factor for farmers' livelihood systems. This is related to one of the indicators of natural capital, namely the type

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of soil in South Tasikmalaya Regency which is dominated by podzolic soil types which are soils with a very high risk of experiencing erosion. Furthermore, the landscape of Tasikmalaya Regency is mostly a form of the earth's surface that is rather steep to steep. IPPF is a farming model that can minimize erosion through a variety of types and ages of plants as well as a variety of types of products and harvest times. This diversity of IPPF causes diversity in land to increase so that the ecological conditions of the land structure become more stable which causes the livelihood system of farmers to be supported by natural capital through sustainable IPPF.

Economic Capital

Economic Capital is capital that already exists in the community that has the potential or can be empowered to support the farmer's livelihood system consisting of cash, credit and savings or reserves. From the data in Table 6 it can be seen that an average of 70.10 percent of respondents agreed and strongly agreed that economic capital is capital needed to support farmers' livelihood systems through sustainable UTPPT management.

Table 6. Economic Capital as a Support for Farmers' Livelihood System

No	Description	Strongly agree	Agree	Simply Agree	Disagree	Strongly Disagree	Total
				(%)			
1	Cash	18.1	57.0	22.0	2.9	0.0	100.0
2	Credit	3.9	48.2	33.2	11.5	3.3	100.0
3	Savings	8.7	74.4	30.7	7.4	0.0	100.0
	Total	30.7	179.6	85.9	21.8	3.3	300.0
	Average	10.2	59.9	28.6	7.3	1.1	100.0

Source: Primary Data Processed, Year 2023

This is related to IPPF which is a farming business that provides opportunities to obtain cash and increases the ability to pay credit and increases the opportunity to have savings by cultivating various agricultural crop commodities and livestock businesses.

Socio-Cultural Capital

Table 7 shows that an average of 83.5 percent of respondents agreed and strongly agreed that social capital is capital needed to support farmers' life systems through sustainable IPPF management.

Table 7. Socio-Cultural Capital as a Support for Farmers' Livelihood System

No	Description	Strongly agree	Agree	Simply Agree	Disagree	Strongly Disagree	Total
				(%)			
1	Institutions/institutions	12.3	65.7	19.6	2.1	0.3	100.0
2	Mutual trust	13.6	72.4	12.6	13.9	0.0	100.0
3	Cooperation	13.0	71.8	14.8	0.4	0.0	100.0
4	Norm	14.0	69.5	14.6	1.9	0.0	100.0
	Total	52.9	279.4	61.6	18.3	0.3	400.0
	Average	13.23	69.85	15.40	4.58	0.08	100.00

Source: Primary Data Processed, Year 2023

Partially the social capital that the farmers responded best to, namely on the indicator of mutual trust as many as 86.0 percent of respondents agreed and strongly agreed that mutual trust is

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social capital that supports farmers' livelihood systems through IPPF. The next indicator that the farmers responded well to was cooperation (84.8 percent), followed by norms (83.5 percent) and finally institutions or institutions (78 percent).

Human Resources Capital

Table 8 shows that human resource capital as capital that supports farmers' livelihood systems is well received by farmers. This can be seen from the average dimension of human resources capital as much as 84.2 percent of respondents agreed and strongly agreed that human resources capital is capital needed to support farmers' life systems through sustainable IPPF management. Partially, the best response to experience from human resource capital was by farmers, namely as many as 91.60 percent of farmers agreed and strongly agreed that the experience indicator is human capital that supports farmers' livelihood systems through sustainable IPPF management followed by indicators of labor (89.3 percent), health (82.6 percent) and education (73.2 percent).

Table 8. Human Resources Capital as a Support for Farmers' Livelihood System

No	Description	Strongly agree	Agree	Simply Agree	Disagree	Strongly Disagree	Total
				(%)			
1	Health	21.4	61.2	15.5	0.0	0.0	100.0
2	Education	11.5	61.7	21.7	4.5	0.6	100.0
3	Experience	29.8	61.8	8.4	0.0	0.0	100.0
4	Labor	15.5	73.8	10.4	0.3	0.0	100.0
	Total	78.2	258.5	56.0	4.8	0.6	400.0
	Average	19,6	64.6	14.0	1.2	1.5	100.0

Source: Primary Data Processed, Year 2023

Physical Capital/Infrastructure

Physical capital/infrastructure is capital that can be created by humans in the form of infrastructure including technology and means of transportation/roads. This physical capital can be used by farming families to support the farmer's livelihood system and become an important capital for work. From the data contained in Table 9 it can be seen that as many as 71.6 percent of farmers agreed and strongly agreed that physical capital in the form of technology and transportation is capital needed to support farmers' life systems through IPPF management so that it is sustainable. From the two indicators of physical capital analyzed, transportation is the factor that farmers respond the most well to, namely 74.70 percent of respondents agree and strongly agree that transportation is physical capital that supports farmers' livelihood systems through IPPF. While the response to technology was lower than transportation by farmers, namely only around 68.30 percent who agreed and strongly agreed that transportation was a factor that supported farmers' livelihood systems through IPPF management.

Table 9. Physical Capital/Infrastructure to Support Farmers' Livelihood Systems

No	Description	Strongly agree	Agree	Simply Agree	Disagree	Strongly Disagree	Total
				(%)			
1	Technology	7.10	61.20	25.60	5.50	0.60	100.0
2	Transportation	5.80	68.90	21.40	3.90	0.00	100.0
	Total	12.90	130.10	47.00	9.40	0.60	200.0
	Average	6.50	65.10	23.50	4.70	0.30	100.0

Source: Primary data processed, 2023.

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CONCLUSION AND SUGGESTION

Based on the results of the research and discussion, the following conclusions can be drawn: 1) Farmers' livelihood strategies to meet their household needs are carried out by seeking income from agriculture and non-agriculture. The total income of farmer households can already cover all household expenses. Based on their purchasing power, all farmer families are able to meet all their expenses; 2). The farmer's livelihood system is supported by capital factors, from capital factors (natural capital, economic capital, socio-cultural capital, human resource capital and infrastructure capital). In an effort to strengthen the farmer's livelihood strategy through sustainable IPPF for the farmer's livelihood system, support is needed from various institutions, namely the government, educational institutions, business actors, communities and the mass media. The government is mainly related to the development of infrastructure, communication as well as helping farmers to gain access to financing from financial institutions to develop their businesses. Furthermore, there is support from research institutions to develop dry land technology with an integrated polyculture system from upstream to downstream in order to increase productivity, added value and selling price of IPPF results. This can be strengthened by universities through the results of research by lecturers and students on the utilization of dry land from upstream to downstream, especially the determination of specific local superior commodities and the development of their added value at the farmer level, which are then disseminated along with their assistance to IPPF farmers as a manifestation of the Tri Dharma of Higher Education. From business actors, it is expected to partner with farmer groups, especially in market development and capital aspects so that IPPF farmers get market certainty and selling prices. From the community (Community) contribute to providing advocacy and assistance to IPPF farmers in the application of new technologies and the development of partnerships/cooperation with external parties of IPPF, in addition to forming and increasing cooperation between farmers. Furthermore, from the media, to disseminate various latest technologies, market information, etc. related to dry land development, which are easily accessible and easily understood by IPPF farmers. However, the government has three roles at once in the pentahelix concept. First, the government acts as a regulator and controller that has regulations and responsibilities in social change. In carrying out its role, the government must always involve all types of its activities, such as planning, implementation, monitoring, control, promotion, financial allocation, licensing and others. The government also acts as a coordinator for stakeholders who contribute to social change including the development of dryland agriculture.

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