The Seybold Report

ISSN 1533-9211

DOI: 10.5281/zenodo.10683365

THE IMPACT OF ADOPTING SUSTAINABILITY PRACTICES ON THE ECONOMIC AND FINANCIAL PERFORMANCE OF FRUIT PRODUCTION

ALI ALSHARAFAT

Climate Change, Sustainable Agriculture and Food Security Program (CCSAFS), Faculty of Agriculture, Jerash University. Email: alijerash@gmail.com

BASSAM ALDESEIT

Department of Economics and Agricultural Extension, Faculty of Agriculture, Jerash University. Email; bassamaldeseet12@gmail.com

HANAN AREF HASAN

Department of Plant Production and Protection, Faculty of Agriculture, Jerash University. Email: jarunih@yahoo.com, ORCID ID: https://orcid.org/0000-0001-5175-0838

SAMAR SHAWAQFEH

Department of Plant Production and Protection, Faculty of Agriculture, Jerash University. Email: s.shawaqfeh@jpu.edu.jo ORCID ID: https://orcid.org/0000-0003-2433-6871.

BAHA'A M. ABU SALMA*

Department of Food Science and Nutrition, Faculty of Agriculture, Jerash University. *Correspondence Author Email: bahaabusalma@gmail.com, b.abusalma@jpu.edu.jo, ORCID ID: https://orcid.org/0009-0009-6984-4379

Abstract

Sustainability has gained a lot of attention, as investors are turning their attention toward this important concept in their enterprises. This study aimed to reveal the impact of adopting sustainable agricultural practices on fruit production's economic and financial sustainability. The study provided empirical evidence that there is a positive impact of adopting sustainability practices on the economic and financial performance of fruit production. A random sample of 151 fruit growers in the Shobak area in Jordan has been interviewed using a research questionnaire developed based on a set of previous relevant studies. The study used a Five-point Likert Scale to determine the level of adopting sustainability practices by fruit producers in the area. The study's results revealed that adopting sustainability practices results in high positive values of productivity index and profitability measures such as gross margin, net farm income and net profit margin, and debt to assets ratio. Based on the results of this study, it is recommended that the adoption of sustainability measures be promoted in other regions of fruit production in Jordan.

Keywords: Sustainability; Practices; Fruit Production; Profitability

JEL Classification: Q130; Q140

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10683365

INTRODUCTION

With a high self-sufficiency ratio of vegetables, fruits, and olive trees, the total cultivated area in Jordan is about 2.1 million dunums (1dunum = 1000 m^2 = 0.10 hectare) with 108 thousand landholdings. The agricultural sector contributed to nearly 5.5% of the Jordanian Gross Domestic Product (GDP) in 2019, but when considering the forward and backward linkages to the sector, the contribution of the sector to GDP will reach around 20% (MoA et al., 2021). Moreover, agriculture is considered a source of income for around 118 thousand households in rural districts and Badia regions of Jordan.

The agricultural sector's contribution to the Jordanian labor force is almost 1.7%. Low investment, weak marketing, weak export promotion activities and facilities, low productivity of rain-fed agriculture, resource depletion (mainly in the water sector), climate change consequences, and poor coordination and coherence with other agriculture-related institutions are among the most important challenges facing the Jordanian agricultural sector (MoA, 2020).

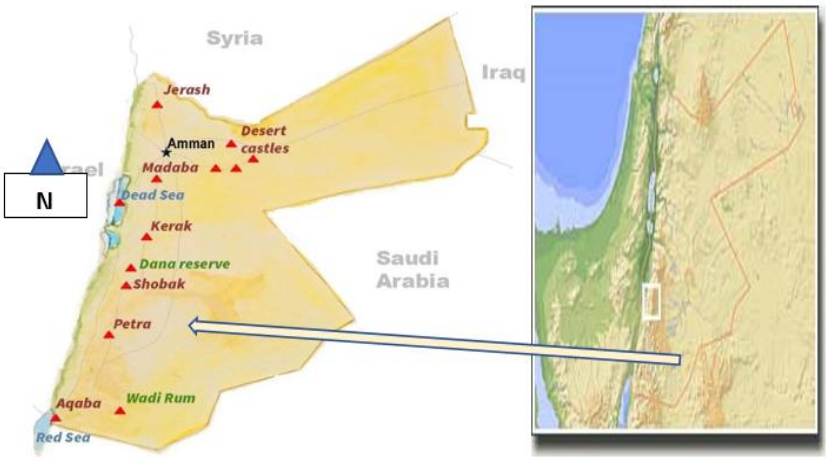
Among several agricultural activities, fruit growing is a very important activity. The demand for fruits is primarily driven by consumers seeking to enhance the quality and variety of their diet. Due to its economic importance as well as its beneficial impacts on human health, fruit production is of great importance in plant production activities. In Jordan, fruit production is a profitable enterprise and a promising way for farmers to increase their income. In 2021, the average area planted in fruit in Jordan was 817778.9 dunums, with a total number of 23.1 million trees, nearly 17 million of which are productive (DoS, 2021). According to the National Food Security Strategy 2021 -2030, in 2121, the total quantity of production of fruits in Jordan was 531217 metric tons with a self-sufficiency of 89%.

One of the main challenges that fruit growers around the world face in their activity is to ensure the sustainability of these activities. Adopting certain practices is the core issue here. The main objectives of such sustainable agriculture practices are to fulfill food human requirements, and reduce the negative burden on the environment and its resources while maintaining economic viability (Dilnashin et al., 2020; Singh et al., 2019).

This study aimed to reveal the impact of adopting sustainable agricultural practices on the economic and financial performance of fruit production in the Shobak area, which is one of the most important regions of fruit production in Jordan. Shobak is in the southern part of Jordan and the northwestern part of Ma'an Governorate (Figure 1). It is an important center in the Governorate regarding agricultural activities, especially fruit production with many cooling and grading centers associated with this activity. In 2021, 23063.6 dunums were planted in fruit in the Shobak area, with a total number of 1.3 million trees; nearly 900 thousand of them are productive. In addition, the total quantity of production of fruits is almost 25000 metric tons (DoS, 2021). Apple, Olive, Apricot, and Peaches are the main produced fruits. The city of Shoubak is about 50 km from the center of Ma'an Governorate, and its villages are located on a mountain with a height of 1120 – 1651 meters above sea level.

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10683365

Figure 1: The location of the Study Area in Jordan

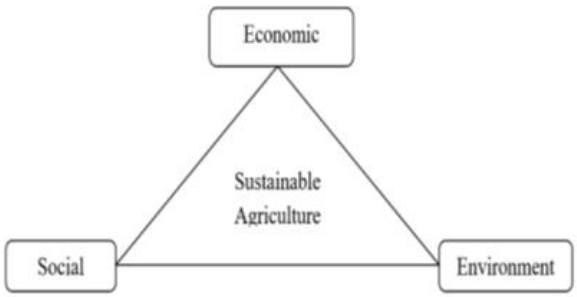


Source: Prepared by the authors based on maps on: https://www.worldmap1.com/jordan-map.asp

What are Sustainable Agriculture Practices?

In recent years, sustainability has gained a lot of attention, as investors are turning their attention toward this important concept in their enterprises (Ameer and Othman, 2012; Lourenço et al., 2012). With sustainable practices in agricultural activities, long-term value is created for all stakeholders – producers, consumers, supply chain partners, local communities, and the whole country. As a concept, sustainability in agriculture has been defined by many entities but was knowledgeably introduced in late 1980 in the report of the World Commission on Environment and Development (Boufous et al., 2023). An agricultural activity with a sustainability agenda is better positioned to manage its economic, social, and environmental changes as they arise (Tensie and Carly, 2016). For example, applying sustainability practices in agriculture such as Orchard grass application significantly increased fruit yield by an average growth rate of 20.7% (Ren et al., 2023). The economic, social, and environmental dimensions (Figure. 2) are the main components when investigating the concept of sustainable agriculture.

Figure 2: Dimensions of Sustainable Agriculture



(Source: Ansari & Tabassum, 2018)

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10683365

Trigo et al. (2021), identified sustainable agricultural practices as a set of goal-oriented strategies, based on scientific knowledge, practices, technologies, or policies. Such sustainable practices can help to manage risks and create value. Several studies confirmed the positive relationship between financial performance and sustainability performance (Alshehhi, et al., 2018). Advanced technical developments and management can lead to sustainable agriculture, emphasizing the importance of natural resource protection (McNeill, 2019).

Farmers adopt sustainability practices through a dynamic learning process, including awareness, interest, information collection, trial and application, scaling up, and decision to scale up or adopt the practices. (Liu et al., 2018). Among the main attributes that influence the process of adopting sustainable agricultural practices are farmers' characteristics (e.g., age, experience, education), farm traits (e.g., size, soils, land tenure, type of production) and financial motivation (government subsidies, farm income, and off-farm income).

Peer pressure, social norms, geographic regions, policies, and markets are other uncertain associated factors related to the process. Among others, crop rotation, crop diversity, no-till and reduced-till systems, use of cover crops, precision farming, and integrated pest management (IPM) are the most well-known sustainable agricultural practices. Implementing these practices enhances the efficient use of natural resources, reduces agriculture's environmental impact, and enhances climate change adaptation.

Several practices can be applied to help fruit growers achieve sustainable activity, these practices mainly include (*UC Sustainable Agriculture Research and Education Program, 2021)***:**

1. Selection of well-suited varieties to the site and conditions on the farm. If site selection is an option, soil characteristics should be considered.
2. Diversification of fruit crops: Here farmers spread economic risk and are less susceptible to price fluctuations by growing a variety of fruit crops. Crop rotation can be used to suppress weeds, pathogens, and insect pests.
3. Management of the soil to enhance and protect soil quality: This is very important because "healthy" soil is a key component of sustainability; that is, healthy soil will produce healthy crop plants. Using cover crops, compost, and/or manures, reducing tillage, avoiding traffic on wet soils, and maintaining soil cover with plants and/or mulches are among the most well-known methods to protect and enhance the productivity of the soil.
4. Efficient and humane use of inputs: This is mainly to develop efficient systems that do not need high levels of material inputs.
5. Consideration of farmers' goals and lifestyle choices: Management decisions should reflect individual goals and lifestyle choices.

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10683365

MATERIALS AND METHODS

A random sample of 151 fruit growers in the Shobak area has been interviewed using a research questionnaire developed based on a set of previous relevant studies. A well-structured questionnaire was administered to these farmers to elicit information on their operations such as unit prices of input and output, scale of production, and revenue. A cross-sectional design sampling approach was used. The sampling technique used is non-probabilistic sampling, a purposive one, where the respondents are limited to specific criteria to achieve the research objectives. The questionnaire consisted of two parts; the first part is concerned with the demographic and introductory information as well as the most important social and economic characteristics of the sample farmers. The necessary data regarding the costs and returns of the investigated activity was included in the first part of the questionnaire. The second part is filled with 26 statements that measure the level of sustainability practices adoption with five answering options. All calculations were based on a unit area of one Dunum (1000 m^2 or 0.10 hectare) as well as averages of costs and returns on an annual *basis*.

Level of Adopting Sustainability Practices

The study used a Five-point Likert Scale survey to achieve its goal of determining the level of adopting sustainability practices by fruit producers in the study area. The options used in the scale included very low (1), low (2), neutral (3), high (4), and very high (5). A mean score of all answers of the sampled farmers was calculated by dividing the total scores of options by the total number of respondents.

The Likert formula is:

$$Xs = \Sigma Fn/Nr$$

Were:

Xs = Mean score.

$\sum$ = summation.

F = frequency of each (5, 4, 3, 2, 1) option.

n = Likert numerical values (responses of the respondents).

Nr = number of respondents to each response category (total number of respondents).

The mean scores were matched by low, medium, and high levels of sustainability practices which were assigned with ranges of 1 to 2.33, 2.34 to 3.66, and 3.67 to 5 respectively.

Sustainability Measures

To confirm the impact of adopting sustainability practices on the economic and financial performance of fruit production activity, a set of economic and financial measures were calculated based on the average values obtained from the sampled farmers practicing olives, citrus fruits, grapes, bananas, apples, almonds, and pomegranates production. These included productivity index, gross margin, net farm income and net profit margin as profitability measures, and liabilities to assets ratio.

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10683365

Productivity Index

Enyedi's method was chosen to compute fruit productivity in the investigated area. Enyedi calculated an index of productivity to determine the levels of crop productivity. According to Enyedi (1964), the formula of the Productivity Index coefficient is as follows:

$$PI = (Y/Yn \div T/Tn) \times 100$$

Where:

PI = Productivity Index coefficient.

Y = Total production of fruit in the study area.

Yn = Total production of fruit at the national level.

T =Total cropped area with fruit in the study area.

Tn = Total cropped area with fruit at national scale.

Enyedi's technique is appreciable in the sense that it determines the productivity index of an area regarding the national level. PI measurement helps in knowing the areas that are performing rather less efficiently in comparison to the neighboring areas. The level of productivity was judged based on the indicated values in Table 1. The Table shows the productivity index values and their corresponding level of production. The values of the productivity levels are closely related to the sustainability levels since sustainability and productivity can work together. The higher the productivity level, the higher the sustainability level. Hence, high production is a reasonable indicator of high level of sustainability of the activity.

Table 1: Productivity index values and their corresponding level.

Value	Level
> 87.5%	Very high
62.5% – 87%	High
37.5% – 62%	Medium
12.5% – 37%	Low
< 12.5%	Very low

Source: Enyedi (1964)

Gross Margin (GM)

The Gross Margin (GM) is the most well-known measure of profitability. Simply, GM is the difference between the Total Revenues or Returns (TR) and the Total Variable Costs (TVC). The higher the GM, the more capital a farm retains, which it can then use to pay costs or satisfy debt obligations, resulting in higher profit due to a high level of sustainability.

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10683365

The following formula was used to calculate the GM (Wrzaszcz and Zegar, 2016).

$$GM = TR - TVC$$

Where:

GM = gross margin.

TR = Total Returns (quantity sold × per unit price). TR = ∑Py. Y, Where: Py = Price per unit output. Y = Total quantity of output (Metric Ton).

TVC = Total Variable Costs. TVC =∑Pxi × xi, Where: Pxi =Price per unit of input, x = Quantity of ith input used.

Net Farm Income (NFI)

The Net Farm Income (NFI) is another well-known measure of farm profitability. NFI is probably the ultimate measure of farm success. Generally, farmer welfare is calculated using NFI. NFI is the difference between the GM and the Total Fixed Costs (TFC). The larger the NFI, the higher the returns and profit, indicating a high level of sustainability of the activity. The following formula was used to calculate net farm income (Gomez and Sanchez, 2010).

$$NFI = GM - TFC$$

Where:

GM = Gross Margin.

TFC = Total Fixed Costs.

Net Profit Margin (NPM)

Net Profit Margin (NPM) measures how efficient financial operations are run in an economic activity. The NPM is a globally adopted standard measure of the profit-generating capacity of a business and is considered a top-level indicator of its potential.

To find the NPM, we divide the net income by total revenue, creating a ratio. We can then multiply by 100 to make a percentage. A value of NPM equal to 10% means that the activity earns 10% profits. NPM explains the percentage of output sales that can be considered profit. The higher the percentage, the higher the returns as well as the higher the net profits indicating a high level of sustainability.

The following formula was used to calculate the NPM (Afzal and Khan, 2017).

$$NPM = [(TR - TC)/TR] \times 100$$

Where:

NPM = Net Profit Margin.

TR = Total Returns (quantity sold × per unit price).

TC = Total Costs, TC = Total Variable Costs (TVC) + Total Fixed Costs (TFC).

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10683365

The above-mentioned formula suggests that the PI divides the projected capital inflow by the projected capital outflow to determine the profitability of an economic activity.

Debt to Assets ratio

The total debt to total assets ratio is a farm financial health indicator. It is calculated by dividing a farm's total debt by its total assets. This criterion means how much of the assets of the farm is financed from its debt. For example, a debt-to-assets ratio of 0.6 (or 60%) means that 60% of the farm's assets are financed using debt. The indicator's value greater than 100% indicates high risk and low sustainability, while a value below 100% indicates more assets and sustainability, suggesting that a lower value indicates a more sustainable farm (Bachev, 2016; Vavrek et al., 2021).

RESULTS AND DISCUSSION

Level of Adopting Sustainability Practices

Table 2. Shows the results related to the measurement of the level of adopting sustainability practices by the investigated activities. The table shows the average scores and the total mean score for the answers of the sampled farmers to sustainability practices items as well as the rank and the level of each practice item. Table 2. Shows that the mean score of the total answers of the sampled farmers is 3.71 which is within the range of (3.67 – 5) indicating that the farmers are adopting a high level of sustainability practices in fruit production activities. The top five practices according to the results shown in Table 2 were as follows:

- Ensuring that farm production will not stop.
- Practicing what preserves fruit production in a sound and good manner.
- Combating diseases and pests.
- Following what improves the productivity of the activity.
- Taking safety measures on the farm.

Table 2: The level of Adopting Sustainability Practices by the Investigated Activities among Farmers

Practice	Average	SD	Level	Rank
I keep my farm records constantly updated	2.98	1.01	Med.	24
I observe the economic laws and regulations in force in my activity	3.39	0.64	Med.	23
I am aware of the financial and economic risks that my activity may be exposed to	3.47	0.82	Med.	19
I developed an action plan for my activity to achieve my economic goals	3.52	0.75	Med.	16
I efficiently use the available resources	3.74	0.58	High	12
I have an emergency plan	2.87	1.19	Med.	25
I always strive to learn and train regarding my activity	3.68	0.94	High	13
I do the necessary maintenance for the equipment used in my activity	3.83	0.59	High	10
I am keen to search for information that is economically beneficial to me in my activity	4.07	0.67	High	7

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10683365

I follow what improves the productivity of my activity	4.37	0.65	High	4
I make sure to use high-quality equipment and tools in my activities	3.87	0.55	High	9
I avoid using poor or low-efficiency production inputs	3.98	0.54	High	8
I take the necessary measures to ensure the validity of the fertilizers and pesticides I use	3.50	0.66	Med.	17
I always use production inputs in a way that does not harm the environment	3.78	0.57	High	11
I manage my inventory efficiently and in an easy-to-use arrangement	3.66	0.89	High	14
I resort to methods that guarantee results in combating diseases and pests	4.39	0.52	High	3
I take the necessary precautions in my activity	3.47	0.63	Med.	22
I maintain channels of communication with farmers in my area of the same activity	3.63	0.86	Med.	15
I study the market and consider its conditions in my activity as much as possible	3.50	0.67	Med.	17
I make sure to deliver products of my activity to the markets in good quality	4.09	0.49	High	6
I always follow changes in the prices of inputs and outputs of my activity	3.45	0.71	Med.	20
I resort to practicing what preserves fruit production in a sound and good manner	4.47	0.60	High	2
I work to educate the workers in my activity economically and financially	3.44	0.87	Med.	21
I always take safety measures in my farm	4.35	0.62	High	5
I work to ensure that my farm production will not stop	4.51	0.59	High	1
I resort to the relevant authorities to support me financially when needed	2.24	1.13	Low	26
Mean Score	**3.71**	**0.72**	**High**	

Source: Authors' calculation

Several studies confirmed the importance of these top practices in improving resource conservation and achieving sustainable activity ((Liu et al., 2018; McNeill, 2019; Ren et al., 2023). The adoption of these practices is a result of a clear understanding of the sampled farmers regarding the importance of keeping a sustainable activity through good management and resource allocation. They do not see sustainability as a burden taking up too much cost, time, and effort. The results presented in Table 2. Show that the adoption of sustainability practices has become a key priority for the investigated farmers, and certainly, they take it seriously. They adopt sustainable practices resembling a set of medium- and long-term strategies based on providing economic crop production and ecological protection. The next section will show the consequences of adopting sustainability practices on some well-known farm-level economic and financial indicators related to sustainability.

Sustainability Measures

As mentioned earlier in section 3, all calculations were based on the average values obtained from the sampled farmers practicing olives, citrus fruits, grapes, bananas, apples, almonds, and pomegranates production. Table 3 below shows the values for each of the Total Returns in JDs (JD = 1.4 USD), the Total Variable Costs in JDs, and the Total Fixed Costs in JDs per unit area

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10683365

(one dunum) as well as the average of these variables.

Table 3: Average Total Returns, Average Total Variable Costs, and Average Total Fixed Costs of the Sampled Fruit Activities Per Unit Area.

Type	TR (JDs)	TVC (JDs)	TFC (JDs)	TC (JDs)
Olives	800	342	100.5	442.5
Citrus	1000	583	190.5	773.5
Grapes	1500	445	978.5	1423.5
Bananas	1250	761	180.0	941
Apples	1000	330	233.5	563.5
Almonds	1500	395	203.5	598.5
Pomegranates	1000	505	200.0	705
Average	**1150**	**480.1429**	**298.0714**	**778.2143**

Source: Authors' calculation. TR: Average Total Returns; TVC: Average Total Variable Costs; TFC: Average Total Fixed Costs; TC: Total Cost; JDs: Jordanian Dinars

Productivity Index

According to the Jordanian Department of Statistics (DoS), in 2021 a total area of 817778.9 dunums was planted with fruit in Jordan, with a total quantity of production of 531217 metric tons. The total area planted with fruit in the study area was 23063.6 dunums with a total quantity of production of 25000 metric tons. Based on these figures, the Productivity Index could be calculated as follows:

$$PI = (Y/Yn \div T/Tn) \times 100$$

Where:

PI = Productivity Index.

Y= Total production of fruit in the study area (25000 metric tons).

Yn= Total production of fruit at the national level (531217 metric tons).

T=Total cropped area with fruit in the study area (23063.6 dunums).

Tn = Total cropped area with fruit at national scale (817778.9 dunums).

Then:

$PI = (25000/531217 \div 23063.6/817778.9) \times 100$

$PI = (0.0471 \div 0.0282) \times 100$

$PI = (1.67) \times 100$

$PI = 167\%$

The PI for the investigated activity is 167%, which is much higher than the highest value presented in Table 1, which is 87.5%. This result reveals that the productivity level is very high confirming a very high level of sustainability of fruit production activity. The result of adopting sustainable practices largely affected the productivity of the investigated farms. These results indicate that the Shobak area is performing rather more efficiently in comparison to the areas

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10683365

of fruit production at the national level.

Gross Margin (GM)

The Gross Margin (GM) is the difference between the Total Revenue or Returns (GR) and the Total Variable Costs (TVC). Table 4 shows the components followed by the calculations of the GM. Based on the figures presented in Table 3, the GM per unit area will be:

GM = TR – TVC

GM = 1150 – 480.2

GM = 669.8 JDs.

Table 4: Averages of Debt and Assets of the Sampled Fruit Activities (Annual Basis)

Type	Value (JDs)
Debt	4287
Assets	89957

Source: Authors' calculation. JDs: Jordanian Dinars

This result reveals that, on average, the investigated fruit farms retain approximately 700 JDs after incurring the direct costs associated with fruit production. This result also shows that, when expressing the GM as a percentage of the total returns, the farms retain about 58% [(669.8/1150) × 100] from each Jordanian Dinar of revenue generated. This value is a very good and acceptable one and means that fruit production is an efficient and profitable business with a high level of sustainability.

The Net Farm Income (NFI)

The Net Farm Income (NFI) was calculated based on the GM of the farming activities and their average fixed costs (AFC) per unit area. NFI considers all accrual-adjusted income and expenses. As indicated in Table 3, The AFC per unit area is 298.1 JDs. With a GM equal to 669.8, the NFI per unit area will be:

NFI = GM – TFC

NFI = 669.8 – 298.1

NFI = 371.7 JDs.

This value of the NFI indicates, on average, that 371.7 JDs have been returned to the owners of the farms or businesses for their investment per unit area. This means that each fruit unit area is generating an average net income of 371.7 JDs. This value of the investigated fruit farms indicates that these farms appear to have a large positive annual NFI indicating a high level of activity sustainability.

Net Profit Margin (NPM)

Profitability Percentage (NPM) is used to assess how much profit may come from a particular

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10683365

investment. It describes an index that represents the relationship between the costs and benefits of a proposed project.

Based on the Figures presented in Table 3, the NPM of the investigated activities is:

NPM = [(TR – TC)/TR] × 100

NPM = [(1150 – 778.2)/ 1150] × 100

NPM = [371.8/ 1150] × 100

NPM = [32.33%]

The average NPM value for the investigated farms is almost 32%. It is positive and high, and the activities are deemed as a good investment. This value indicates that the net cash inflows of the activity are greater than the net cash outflows by 32%. It also indicates that the investigated activities are profitable, revealing a good level of sustainability.

Debt (liabilities) to Assets ratio

The debt-to-assets ratio aids in determining a farm's capacity to service its long-term debt commitments. This ratio is largely related to farm sustainability since it reflects how financially stable a farm is. A higher ratio means less sustainability and vice versa. Based on data collected from the investigated farms, the averages of debt and assets of these farms are presented in Table 4.

The debt-to-assets ratio for the investigated farms was calculated as follows:

Ratio = (Debt/ Assets) × 100

Ratio = (9287/ 89957) × 100

Ratio = 10.324%

The above calculated low value of debt to assets ratio of the investigated farms signifies that these farms are financially solid which lowers the chance of insolvency. This value means that only 10% of the investigated farms' assets are financed by creditors, and 90% are financed by owners' (shareholders') equity. The value indicates that the farms are not breaching their debt covenants and will not run the risk of being forced into bankruptcy by creditors and the farms are not at risk of defaulting on their loans.

CONCLUSION AND RECOMMENDATIONS

This study provided empirical evidence that there is a positive impact of adopting sustainability practices on the economic and financial performance of fruit production. The study's results revealed that adopting sustainability practices will result in high values of productivity index and profitability measures such as gross margin, net farm income net profit margin, and debt (liabilities) to assets ratio. These results suggest that there is a high level of economic and financial performance of the investigated farms because of adopting sustainability practices in these farms. It can be concluded that the farming activity in question is economically and

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10683365

financially viable with the minimum level of risks and, hence, it is sustainable and can survive in the long run. Based on the results of this study, it is recommended that the adoption of sustainability measures be promoted in other regions of fruit production in Jordan.

References

1) Afzal, M., & Khan, M. (2017). Economic analysis of broiler poultry farms: a case study of District Lower Dir. Sarhad Journal of Agriculture, 33(1), 183-188. http://dx.doi.org/10.17582/journal.sja/2017.33.1.183.188.

2) Alshehhi, A., Nobanee, H., & Khare, N. (2018). The Impact of Sustainability Practices on Corporate Financial Performance: Literature Trends and Future Research Potential. MDPI. Sustainability, 10 (2), 494; **https://doi.org/10.3390/su10020494**

3) Ameer, R., & Othman, R. (2012). Sustainability Practices and Corporate Financial Performance: A Study Based on the Top Global Corporations. J Bus Ethics.108, 61–79. https://doi.org/10.1007/s10551-011-1063-y

4) Ansari, S. & Tabassum, S. (2018). A New Perspective on the Adoption of Sustainable Agricultural Practices: A Review. Current Agriculture Research Journal, 6, 157-165. doi: http://dx.doi.org/10.12944/CARJ.6.2.04

5) Bachev, H. (2016). Sustainability of farming enterprise - understanding, governance, evaluation. Ekohomika, 2(179), 6-15. doi.org/10.17721/1728-2667.2016/179-2/1.

6) Boufous, S., Hudson, D., & Carpio, C. (2023). Farmers' willingness to adopt sustainable agricultural practices: A meta-analysis. PLOS Sustain Transform, 2(1), e0000037. https://doi.org/10.1371/journal.pstr.0000037

7) Department of Statistics (DoS). (2021). Statistics. Fruit Trees statistics. http://www.dos.gov.jo. Accessed on 12 January 2023.

8) Dilnashin, H., Birla, H., Hoat, T.X., Singh, H.B., Singh, S.P. & Keswani, C. (2020). Applications of agriculturally important microorganisms for sustainable crop production. In Molecular Aspects of Plant Beneficial Microbes in Agriculture; INC: New York, NY, USA; 403–415. ISBN 9780128184691.

9) Enyedi, G. Y. (1964). Geographical Types of Agriculture. Applied Geography in Hungary (Studies in Geography), Budapest: Akademiai Kiado.

10) Gomez, J., & Sanchez, G. (2010). Empirical evaluation of agricultural sustainability using composite indicators. Ecological Economics, 69 (5), 1062-1075. doi.org/10.1016/j.ecolecon.2009.11.027

11) Liu, T., Bruins, R.J.F., & Heberling, M.T. (2018). Factors influencing farmers' adoption of best management practices: A review and synthesis. Sustainability,10. (2), 432. https://doi.org/10.3390/su10020432

12) Lourenço, I.C., Branco, M.C., Curto, J.D., & Eugénio, T. (2012), How Does the Market Value Corporate Sustainability Performance? J. Bus. Ethics, 108 (4), 417–428.

13) MOA (The Jordanian Ministry of Agriculture). (2020). Agriculture Sector Strategy, 2020-2025. Amman – Jordan. Retrieved January, 12, 2023, from https://moenv.gov.jo/ebv4.0/root_storage/ar/eb_list_page/20022_jordan_agriculture_v06_rc_web-0.pdf

14) MoA (The Jordanian Ministry of Agriculture), WFP (World Food Program), FAO (Food and Agriculture Organization of the United Nations), UNDP (United Nations Development Program), Economic and Social Commission for West Asia (ESCWA), and Netherlands Embassy. (2021). National Food Security Strategy 2021 -2030. Amman – Jordan. Retrieved January 12, 2023, from https://jordan.un.org/sites/default/files/2022-10/Document%202%20-%20The%20National%20Food%20Security%20Strategy.pdf

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10683365

15) McNeill, D. (2019, January). The Contested Discourse of Sustainable Agriculture. Global Policy, 10 (S1), 16–27. doi.org/10.1111/1758-5899.12603

16) Singh, M., Singh, D., Gupta, A., Pandey, K. D., Singh, P.K., & Kumar, A. (2019). Plant Growth Promoting Rhizobacteria; Elsevier Inc.: Amsterdam, The Netherlands; ISBN 9780128158791.

17) Trigo, Ana., Marta-Costa, Ana., & Fragoso, Rui. (2021). Principles of sustainable agriculture: Defining standardized reference points. Sustainability, Vol.*13*. Issue 8, 4086; https://doi.org/10.3390/su13084086

18) *UC Sustainable Agriculture Research and Education Program. (2021). "What is Sustainable Agriculture?" UC Agriculture and Natural Resources.* Retrieved January 12, 2023, from *https://sarep.ucdavis.edu/sustainable-ag*

19) Wrzaszcz, W., & Zegar, J. S. (2016). Economic sustainability of agricultural holdings in Poland in the context of their environmental impact. European Journal of Sustainable Development, 5(4), 497-508. doi: 10.14207/ejsd. 2016.v5n4p497.

20) Vavrek, R.; Krav cakova Vozárová, I., & Kotulic, R. (2021). Evaluating the Financial Health of Agricultural Enterprises in the Conditions of the Slovak Republic Using Bankruptcy Models. Agriculture, 11(3), 242. https://doi.org/10.3390/ agriculture11030242