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## **Determinants of Sustainability: A Case of Piloting ISARD Models in Oriental Mindoro and Leyte, Philippines**

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# Determinants of Sustainability: A Case of Piloting ISARD Models in Oriental Mindoro and Leyte, Philippines

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**Abstract.** SEARCA, in its 10th five-year plan (10<sup>th</sup> FYP), implemented the program, Inclusive and Sustainable Agricultural and Rural Development (ISARD). A pilot project was undertaken in a specific rural community following a well-defined scheme for an agroecosystem and through the integration of four inter-related components, technical assistance, capacity building, knowledge management, and linkage and networking. After the completion in 2020, evidences of well-developed agricultural system capable of contributing to the goals of food security and poverty alleviation emerged. In its 11<sup>th</sup> FYP, SEARCA endeavors to scale out the ISARD model project in the Southeast Asian region. But, how will this benefit from adopting FAO's Sustainable Food and Agriculture (SFA)? This central question was addressed by authors in this study. Using an indicator-based assessment approach, the results revealed that the pilot ISARD project, in general, has adopted the SFA principles. It is rated as Good Sustainability, with an overall SFA index of 0.62. To further meet the aspired sustainability through agricultural interventions, the design, delivery, and implementation of ISARD components should include aspects related to facilitating access to productive resources, finance, services for basic infrastructure, protecting water resources, promoting tenure systems to access land, and enhancing nutrition-based programs for the community.

## 1. Introduction

Sustainable development is a concept defined by the Brundtland Commission (formerly the World Commission on Environment and Development) in 1987 as a development that “meet the needs of the present generation without compromising the ability of the future generations to meet their own needs” [1]. The Agenda21, a framework that aimed to achieve a balanced and integrated approach to address environmental and development issues, was launched during the Rio Earth Summit in 1992. Here, the growing need to combine the environmental, economic, and social pillars of sustainability arises [2].

The Triple Bottom Line (TBL) is a model coined by Elkington in 1998 based on the three pillars of sustainable development: social, environmental, and economic – and sustainability can be seen where these pillars overlap. These are focused on the people (social), profit (economic), and the planet (environment). Social sustainability means ensuring equality, human rights, preservation of cultural identity, respect for cultural diversity, health, education, and other services that affect the overall quality of life. Economic sustainability relates to achieving income, revenues, and investments



required for living standards. Environmental sustainability pertains to the management and protection of the natural resources which are needed to conduct economic activities [3][4].

The Food and Agriculture Organization's (FAO) common vision and approach for sustainable food and agriculture (SFA) objectively set agriculture that will meet the needs of present and future generations, while ensuring profitability, environmental health, and social and economic equity. By aligning to this framework, interventions at various scales can contribute to the global efforts to implement the 2030 Agenda for Sustainable Development [5].

The SFA features the five principles that balance the social, economic, and environmental dimensions of sustainable food and agriculture, providing the basis for developing policies, strategies, regulations, and incentives that are in line with the 2030 ASD. The five principles can be broadly explained by the following: (1) Efficient production practices; (2) Conservation, protection of natural resources; (3) Improve livelihoods, equity, and social well-being; (4) Enhance resilience of people, communities, and ecosystems; and (5) Effective governance for sustainable socio-ecological systems.

The conceptual model of the SFA shows the interconnectivity between the natural and human systems and how agriculture shapes the use and management of natural resources while maintaining social and economic services and developments. The natural system (environment) provides services to the human system (i.e., provisioning, cultural, regulating, and supporting) and natural resources including land, ocean, water, genetic and biodiversity resources, forest, aquatic and marine systems, among others. On the other hand, the human system provides economic and social services (e.g., growth, poverty reduction, employment, stability, health, and nutrition) and agricultural products (food, feed, fiber, and fuel). These products and services were provided through agricultural activities and practices including crop and livestock production, forestry, fisheries, and aquaculture [5].

SEARCA, in partnership with State Universities and Colleges (SUCs), Local Government Units (LGUs), and Farmers Associations, started a project in 2015 on Piloting and Upscaling Effective Models of Inclusive and Sustainable Agricultural and Rural Development (ISARD) in two selected pilot sites: Victoria, Oriental Mindoro, and Inopacan, Leyte. As contained in its 10th Five-Year Plan (FYP), SEARCA addressed the needs of its beneficiaries by embedding the Center's overarching theme of Inclusive and Sustainable Agricultural and Rural Development (ISARD) in major project initiatives and start new strategic thrusts and innovative approaches at the grassroots. Through this strategy, SEARCA designed and pilot-tested holistic pathways toward achieving ISARD, and involved the participation, engagement, and empowerment of rural communities. An operational structure in achieving project outputs and outcomes was adopted towards the twin goals of food and nutrition security and poverty reduction. The project activities are anchored on its four major components, namely technical assistance, capacity building, knowledge management, and linkage and networking.

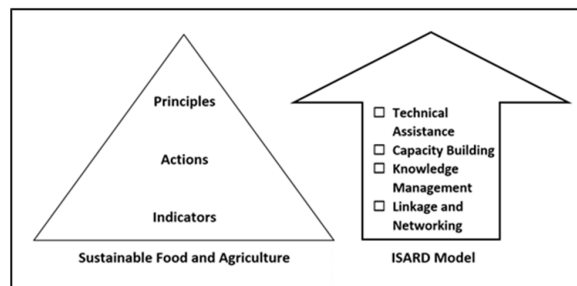
The execution of the four project components was translated into development strategies under an ecosystem-based, entrepreneurial, systems-oriented, and interdisciplinary type of activities. The three-year implementation of the project included mobilization and social preparation activities for the first year consisting of consultations and participative workshops while knowledge integration and technology adoption were applied in year two which included the establishment of demonstration farms and learning sites. In its third year, institutionalization was achieved by capacitating the local project implementers and lobbying the budget for the project in the municipalities' annual investment plan. The stages of empowerment were seen through these series of implementations wherein SEARCA and partner universities took the lead role in the beginning but over time passed the baton to the LGU and farmers with increased knowledge, skills, linkages, and opportunities in handling the project. This turned into development outcomes of inclusive and sustainable agricultural communities which in the long term achieved the impact of food and nutrition security and poverty reduction.

The general objective of the study is to assess the sustainability of the ISARD model by determining the level of adoption of the SFA principles through a document review and scoring approach of indicative determinants of the SFA. This is rooted in the premise that scaling the implementation of the ISARD model in various conditions and systems would contribute to achieving the desired sustainable development in target areas. Specifically, this study would: 1) Identify the

determinants that contribute (positively/ negatively) to the successful adoption of SFA principles in the ISARD model; 2) Suggest considerations for scaling the interventions; and 3) Recommend strategies to enhance the best practices and opportunities to improve the model's sustainability.

## 2. Materials and methods

To determine the level of adoption of SFA principles in implementing the pilot ISARD project, this study adopts a multi-level assessment method using an indicator-based approach (figure 1). This starts with the identification of the components that best described the SFA principles following a three-tier hierarchy represented by the interconnected actions and indicators described by FAO.



**Figure 1.** Multi-level SFA assessment method for evaluating the ISARD Model

### 2.1. Selecting the Indicators

The five SFA principles were accompanied by 20 interconnected actions set by FAO to guide the decision-makers in assessing the sustainability of a system at the farm, community, or national level. In these set actions, 41 indicators for its successful implementation were gathered from several FAO documents. [6][7]

### 2.2. Document review and scoring process

To be able to decide at what level the SFA principles were adopted, the presence or absence of the SFA principles were determined by cross analyzing them with the ISARD program components, particularly by assessing whether the activities conducted under each component would correspond accordingly with the SFA principle. A comprehensive review of ISARD project reports, M&E documentation, and other related documents was conducted. After scrutiny of the ISARD-related documentation, Action 10, which is to promote secure tenure rights for men and women, under Principle 3: Improve livelihoods, equity, and social well-being, was not included in the assessment owing to the consideration that the ISARD program did not specifically target tenure since this was not within the concerns experienced in the target sites. To include the above action in the list of elements for the assessment of SFA adoption would make a biased evaluation. Since SFA Action 10 was excluded, there were only 19 actions and 40 indicators that were subjected to the analysis.

Given that a clear indication of project activities for each ISARD component will merit a score of 1 while a score of 0 will be given once there is no clear indication of any related project activities, each indicator, therefore, can be computed based on the following formula:

$$SFA\ Indicator\ Scores_i = \frac{\sum_{ISARD\ Component\ Scores}}{n_{ISARD\ Component}} \quad (1)$$

wherein, the sum of all ISARD scores provided for each indicator will be added and divided by the total number of ISARD components, which is four. Subsequently, since several indicators represent the action that corresponds to an SFA principle, we can compute for each SFA action following the formula:

$$SFA\ Action\ Scores_i = \frac{\sum_{SFA\ Indicator\ Scores}}{n_{SFA\ Indicators}} \quad (2)$$

wherein all indicator scores computed based on the initial identification of presence and absence in ISARD components, and all corresponding under one action under an SFA principle, will be added together and divided by the number of indicators representing the action. Finally, to determine the level of adoption of SFA principles, we can compute the scores for each using the formula:

$$SFA\ Principle\ Scores_i = \frac{\sum SFA\ Action\ Scores}{nSFA\ Actions} \quad (3)$$

wherein, all the action scores under a specific SFA principle will be added and averaged to provide the score for the SFA principle. A similar approach for computing each SFA principle, expecting a range of 0 to 1 for each, wherein 1 represents the highest level of adoption of SFA principles in implementing the pilot ISARD project, corresponding to the levels of sustainability, which were adapted from Manning and Soon, 2016 [8]:

- Low Sustainability:  $0 < SFA\ Index < 0.2$  - The index/indicator shows a need for evaluation to determine areas for improvement and the prioritization for action is a high priority.
- Fair Sustainability:  $0.21 < SFA\ Index < 0.4$  - The index/indicator shows improvements are required with medium priority.
- Average Sustainability:  $0.41 < SFA\ Index < 0.6$  - The index/indicator shows a need for evaluation to determine areas for improvements, but this is of low priority.
- Good Sustainability:  $0.61 < SFA\ Index < 0.8$  - The index/indicator shows this area is under control, but continuous improvement can still be made to achieve excellent status.
- Excellent Sustainability:  $0.81 < SFA\ Index < 1.0$  - Sustainability is achieved.

Meanwhile, an overall SFA index was then computed based on the formula:

$$SFA\ Index_i = \frac{\sum SFA\ Principle\ Scores}{nSFA\ Principles} \quad (4)$$

wherein, all the principle-level scores are added and averaged to likewise provide a score that ranges from 0 to 1, where 1 is the highest level of conforming to sustainability.

### 3. Results and Discussions

The results following the index-based computations revealed that the ISARD project implemented in both sites, in general, has adopted the SFA principles. The results showed that the ISARD project is rated as Good Sustainability, with an overall SFA index of 0.62 (table 1). Categorically, it can be observed that the overall SFA adoption rate is defined by the primary regard given by the ISARD project on Principle 5, which is scored at 0.77. In terms of ranking, this score is being followed by Principle 1 (0.64), Principle 3 (0.63), Principle 4 (0.63), and finally by Principle 2 (0.44).

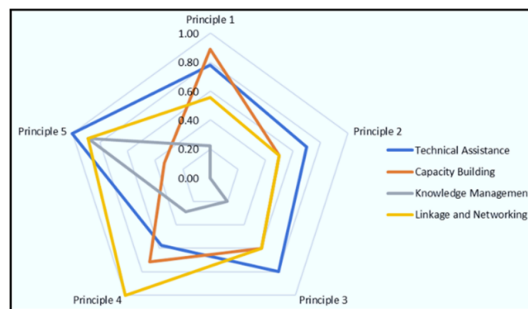
**Table 1.** SFA principle-level scores and overall SFA index.

SFA Principles	SFA Principle Scores*	Overall SFA Index*
Principle 1	0.64	0.62
Principle 2	0.44	
Principle 3	0.63	
Principle 4	0.63	
Principle 5	0.77	

\*0 < SI < 0.2 – low; 0.20 < SI < 0.4 – fair; 0.40 < SI < 0.6 – average; 0.60 < SI < 0.8 – good; 0.80 < SI = 1.0 - excellent

By computing the ISARD components for all the 40 SFA indicators, however, an overall SFA index rating is observed to be highest for Technical Assistance at 0.77, followed by Linkage and Networking (0.71), Capacity Building (0.61), and Knowledge Management (0.32), respectively. Meanwhile, it can be distinguished by the principle-level scores collected that Technical Assistance ranked highest on Principle 5 (1.0) while lowest on Principle 4 (0.57). Linkage and Networking, on the other hand, scored highest on Principle 4 (1.0) but lowest on Principle 2 (0.50). Capacity Building scored highest on Principle 1 at 0.89 while scoring lowest on Principle 5 (0.33). Finally, Knowledge

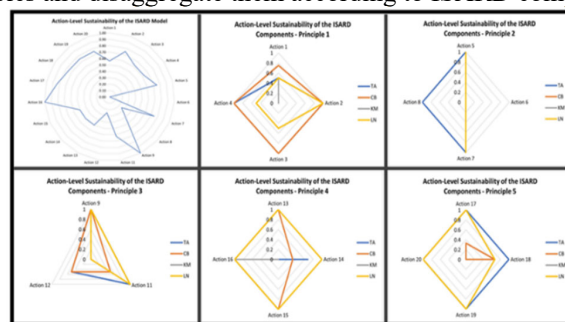
Management, while garnering the lowest contribution to SFA adoption scoring, received the highest score on Principle 5 (0.89), like Technical Assistance, and the lowest score on Principle 2 (0.00) like Linkage and Networking. Figure 2 shows the graphical attribution of resulting principle-level scores according to ISARD components.



**Figure 2.** Principle-level Scores according to ISARD Components

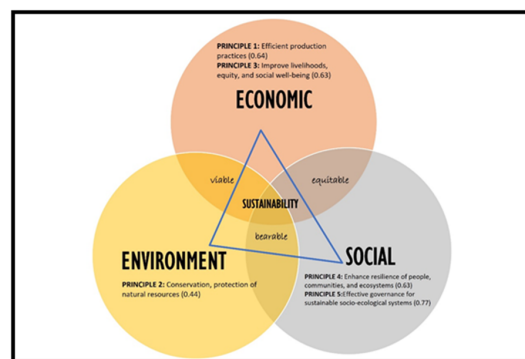
Relatedly, the results of scores at the action level varied across principles and this is practically due to the 40 indicators that were assessed individually on the evidence of ISARD component activities that are related to the SFA Principles. Out of the 40 SFA indicators used for evaluating the ISARD components, seven highest indicator-level scores were observed in five SFA action areas namely, 1) Indicator 2, Greater access to affordable, quality seeds, and planting materials of suitable crop varieties; 2) Indicator 4, Increased level of farm mechanization (from production to processing and value-adding interventions) all under Action 1, Facilitate access to productive resources, finance, and services; 3) Indicator 20, Involvement/Engagement of women, youth, and other vulnerable groups (indigenous people, migrants, and refugees) in the development processes under Action 9, Empower people and fight inequalities; 4) Indicator 31, Preservation of traditional knowledge systems; 5) Indicator 32, Recognition of the interrelations and interdependencies among social systems and ecosystems and the need for multisectoral approaches to development under Action 16, Strengthen ecosystem resilience; 6) Indicator 33, Increased effective participation of stakeholders, including women, youth, and vulnerable sectors under Action 17, Enhance policy dialogue and coordination, and 7) Indicator 38, Encourage formation of associations under Action 18, Strengthen innovation systems.

Despite receiving the highest indicator scores, some of these SFA actions were found to be not rated highly due to the cancellation effect when added with other indicators that received low scores. Among the SFA Actions above that received the highest scores at the indicators-level, only Action 9 and Action 16 received 1.0. These were followed by Action 17 (0.83), and Actions 2, 5, 7, 18, 19, and 20, each receiving a score of 0.75, respectively. In figure 3, we can observe the highest-rated SFA Actions per SFA Principles and disaggregate them according to ISARD components.



**Figure 3.** Action-level scores per SFA Principle and ISARD components

While the result points out that the level of SFA adoption in the implementation of the ISARD models in Oriental Mindoro and Inopacan, Leyte is considerably at a good level, it would be better to understand the underlying extent of this rating by looking further at the sustainability pillars through the TBL approach. The TBL is focused on the interaction of the sustainability pillars, namely economic, environmental, and social. Injecting the SFA principles into the sustainability pillars, Principles 1 and 3 are anchored on the economic pillar, Principle 2 on the environmental pillar, and Principles 4 and 5 on the social pillar. As in TBL, sustainability can be seen where the three pillars overlap (figure 4).



**Figure 4.** The Triple Bottom Line of Sustainability and SFA Principles

The index values above show that the social pillar, which included Principle 4 (0.63) and Principle 5 (0.77), is strong in the ISARD model. Both index values indicate a good level of sustainability, which means that the current interventions and indicators are under control and improvements can be made to achieve excellent status. The economic pillar, composed of Principle 1 (0.64) and Principle 3 (0.63), is moderate or on the average level of sustainability. These values indicate a need for evaluation to identify areas for improvement. Lastly, the environmental pillar or Principle 2 has the lowest index value of 0.43. This implies that improvements in this pillar or principle are required with medium priority.

#### 4. Conclusion

ISARD as a scheme and approach of engaging multiple stakeholders toward improving the well-being of the rural poor through their improved natural resource-based livelihoods along with support systems and institutions that contribute to food and nutrition security of the wider population beyond present generations.

Since the objective of the study is to determine the extent to which SFA principles have been incorporated in the pilot ISARD project, the authors used the SFA actions and indicators as benchmark conditions and have compared these with ISARD components' activities. In general, we can surmise from the results that there is a significant level of adoption of SFA in the ISARD. Some actions, nonetheless, are needed for improvement to fully adhere to the SFA principles and these include facilitating access to productive resources, finance, and services for basic infrastructure, protecting water resources, promoting tenure systems to access land, and enhancing nutrition-based programs for the community.

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