



University of Zabol

Graduate School

Faculty of Agriculture

Department of Agronomy

Thesis Submitted in Partial Fulfillment of the Requirement for the degree of Phd
in Agroecology

Title

Evaluating the sustainability and economic efficiency of banana, mango, papaya and
guava production systems in Balochistan and determining their fair sales price

Supervisor

Dr. Mohammad Reza Asgharipour

Dr. Mahmoud Ramroudi

Advisors

Dr. Ahmad Ghanbari

Dr. Esmaeel Seyedabadi

By

Mansour Adl

January 2024

Abstract

Agro-ecosystems are systems that depend on various environmental and industrial inputs, which producers often use improperly to increase their economic performance. This causes the ecological capacity and durability of production to be endangered due to factors such as environmental pollution and resource erosion. Therefore, the relationship between the inputs to the production systems of banana, mango, papaya and guava and their effects on the sustainable production of these products led to the quantification of the sustainability of these systems in this study. Two techniques of emergy and emergy footprint were used to identify the sustainability status of the target systems. This study was conducted using the information collected from library sources, agricultural jihad experts, managers of production systems and weather statistics recorded by experts of co-visit stations in the southern regions of Baluchestan (Chabahar, Qasr-e Qand, Sarbaz and Dashtyari) in 1401. The results showed that the production systems of Dashtyari city had the highest consumption of renewable environmental inputs. In terms of consumption of non-renewable environmental inputs, the systems in Chabahar city ranked first and the most dependent systems on economic resources were in Sarbaz city. The dependence of the production systems in Chabahar city on non-renewable environmental inputs caused these systems to have the highest environmental loading ratio (ELR) compared to the systems in other regions. Also, the high impact of economic inputs on the production systems in Sarbaz caused the production of bananas in this city to be in an unfavorable situation in terms of the EYR index. In terms of economic superiority, the net profit of mango producers in Qasr-e Qand and Sarbaz was higher than other products under study. In all production systems, the biological capacity was smaller than the emergy footprint. As a result, due to the high ecological demand, the target systems of the study faced an ecological deficit and also exerted a lot of pressure on the surrounding ecosystems, which resulted in the region distancing itself from ecological safety. Therefore, the results showed that the improper management of production systems caused a large amount of environmental and economic inputs to be wasted. Therefore, it is necessary to revise the management methods of the systems and consider the internal capacities of the system to reduce the economic and ecological costs.

Keywords: environmental effects, production sustainability, economic profit, ecological capacity, regional safety