Agroforest Syst (2018) 92:195–211
https://doi.org/10.1007/s10457-016-0025-x

Economic assessment of agri-horticulture production systems on reclaimed ravine lands in Western India

V. C. Pande · R. S. Kurothe · Gopal Kumar · H. B. Singh · S. P. Tiwari

Received: 19 October 2015 / Accepted: 20 September 2016 / Published online: 26 September 2016

Abstract This study examines economic sustainability of agri-horticultural systems on reclaimed ravine lands in western India. Ravine lands are marked by their susceptibility to soil erosion along the course of river systems. Introduction of tree component with traditional crops on such marginal lands is beneficial not only in terms of short-term profitability but also resource conservation. *Moringa oleifera* (drumstick)- and *Emblica officinalis* (aonla)-based agri-horticulture trees with *Phaseolus radiatus* and *Foeniculum vulgare* crops have been examined as case studies based on data from a research farm adjacent to a major ravine system in western India. Drumstick, as green pod and also in dried powder form, is traditionally used as vegetable in Indian diet. Aonla is used in various forms as food as well as for medicinal purpose. This is marketed in different forms such as pickle, candy and dried powder. Enterprise budgeting analysis revealed that the net present values from *M. oleifera* + *P. radiatus* followed by *F. vulgare* and *E. officinalis* + *P. radiatus* followed by *F. vulgare* were 386 and 1190 USD ha^{-1}, respectively, at 2012–13 local prices over a production cycle of 15 years. Saving in soil nutrients and soil carbon build-up worth 12–240 and 665 USD ha^{-1} was observed. Further, the land expectation value of *E. officinalis*-based agri-horticulture production system (1564 USD ha^{-1}) revealed higher land value as compared to tobacco monocropping system (1039 USD ha^{-1}). While the financial viability of these cropping systems proved their worth on the marginal lands of ravines in Gujarat, market and yield risks in crop component, examined through sensitivity analysis, need to be taken into consideration before recommending the agri-horticultural system to farmers. Nevertheless, in view of the declining profitability of the tobacco crop, largely grown on reclaimed ravine lands, an alternative production system, particularly aonla-based agri-horticulture system would help farmers explore alternative production system suiting to their resource endowments.

Keywords Agri-horticulture · Enterprise budget analysis · Land equivalent ratio · Land expectation value · Net income

V. C. Pande (✉) · R. S. Kurothe · G. Kumar · H. B. Singh
ICAR – Indian Institute of Soil & Water Conservation, Research Centre, Anand, Vasad 388 306, Gujarat, India
e-mail: vcpande64@gmail.com

R. S. Kurothe
e-mail: kurothe@yahoo.com

G. Kumar
e-mail: gkcswcrti@gmail.com

H. B. Singh
e-mail: hbsingh@yahoo.com

S. P. Tiwari
ICAR – Indian Institute of Soil & Water Conservation, Research Centre, Datia, Madhya Pradesh, India
e-mail: sptiwari_soils@yahoo.co.in