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Machinery ownership model for effective smallholder mechanised rice production in Ghana

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Abstract

Rice is a major staple in Ghana and there are constant efforts to increase its production locally. As of 2020, local rice production figures were 987,000 tons, an increase of about two hundred thousand tons from 721,465 tons in 2017. This shows a very promising trend in ensuring local production of rice. However, the major rice producers are smallholder farmers whose processes are riddled with drudgery. In addition to ensuring continued production, the smallholder farmers are being introduced to conservation agriculture farming methods. Though they are gradually adopting conservation agriculture methods of production, the level of drudgery in their production still poses major problems for their agenda to increase production sustainably. This study was formulated on the premise that if smallholder rice farmers can own/access machinery easily, it will increase their productivity. As such the study aims at providing a machinery ownership model for smallholder farmers that is economically feasible and sustainable. This was done by first evaluating the level of mechanisation through a survey of 150 rice farmers in both the southern and northern sectors of the country. The field data collected from rice production centres in the northern and southern parts of Ghana showed that aside from the major issues with rice production mechanisation, only specific processes along the value chain receive attention regarding mechanisation. Based on technical specifications, the study provided the full set of equipment required to mechanise smallholder rice farming and then further developed economic models around ownership of the machinery. The net present value and cost-benefit-ratio analysis of the business models developed show that the best model is where farmer cooperatives own machinery and hire it out to members.

Keywords: Business model, conservation agriculture, economic, mechanisation, rice, sustainable

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