

灌漑地区上流への野菜作導入で農家の所得向上と灌漑水の公正配分が両立する

Introducing vegetables upstream of irrigation areas may increase farm income and lead to equitable water distribution

水不足でコメの不作付地が増加しているタンザニア北部ローアモシの灌漑スキームでは、水田裏作への野菜導入で所得向上と灌漑水利用の効率化と均等な水配分が期待できる。

水稻に比較してトウモロコシは灌漑水量が77%、灌漑日数から野菜はそれ以上の節水効果が見込まれる(表1)。

水田裏作に野菜を導入すれば水稻二期作を上回る所得が期待できるが、家族労働の自己評価が高い世帯は利潤動機が働くので野菜導入の経済的インセンティブは弱い(表2)。

自給作物(稲、トウモロコシ)を減らし利潤変動が大きく貯蔵性のない商品野菜に特化すれば、世帯レベルの食料安全保障を低下させる恐れがある。

In Lower Moshi, northern Tanzania, where water is scarce, growing vegetables after rice upstream could increase income and lead to efficient irrigation and fair water allocation. Compared to rice, maize could save 77% of irrigation water, more so with vegetables due to less irrigation days.

Although the rice-vegetable system could generate more income than double rice cropping, there is weak economic incentive to introduce vegetables for households with a high opportunity cost of family labor due to the profit motive.

Reducing rice and maize and specializing in perishable vegetables, which are subject to large profit fluctuations, may reduce food security at the household level.

表1. 作目別の必要灌漑水量の推計値(2018-19年、1作当たり)

Table 1. Estimation of irrigation water requirements by crop (per crop season, 2018-19)

	Lowland rice ¹	Lowland maize ¹	Vegetables ²
Irrigation period (day)	110	25	13.2
Daily irrigation amount (mm/day)	13	13	NA
Total irrigation amount (mm)	1,430	325	NA

1) 水路灌漑。栽培試験の実測値。2) 同一地区の整備水田であるが、灌漑水の供給がないためにポンプによる個別灌漑で野菜を栽培している水田での聞き取り調査(n=9)。農家が用いるポンプの能力は15 mm/day以下。アフリカンナイトシェイド、アマランサス、タマネギ、ピーマン、白菜、カボチャを販売目的で生産。

1) Canal irrigation. Measured in cultivation trial. 2) Interviews (n=9) in the irrigation scheme, vegetables are grown by private pump irrigation due to lack of canal water supply. The pumps used by the farmers have a capacity of less than 15 mm/day. African nightshade, amaranth, onion, bell pepper, Chinese cabbage, and squash are produced for market.

表2. 作目別の所得・利潤(2018-19年)

Table 2. Production cost and management indicators by crop (2018-19)

Condition of irrigation (Sample number)	Rice	Maize		Vegetables
	Irrigated lowland (78)	Irrigated lowland after rice (10)	Irrigated upland (5)	Well irrigation (9) ¹
Income ² (1,000 Tsh/ha)	3,682	2,287	1,405	4,276
Profit ³ (1,000 Tsh/ha)	3,202 (0.44) ⁴	1,746 (0.95) ⁴	1,027 (1.19) ⁴	2,188 (2.28) ⁴

1) 浅井戸を水源とするポンプによる個別灌漑。2) 所得: 粗生産額 - 支払い費用。3) 利潤: 所得 - 標準的な農業雇用労賃で推計した家族労働費。4) カッコ内の数値は変動係数。利潤のバラツキを表しリスクの代理指標となる。

1) Private pump irrigation using shallow well. 2) Gross product - paid-out costs. 3) Income-imputed family labor cost based on market wage rate. 4) The number in parentheses is the coefficient of variation, representing the variability of profit as a proxy indicator of risk.

Reference: 横山 (2022) 農業経営研究 59(4): 69-74.
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