

Ergonomics: A Categorical Imperative Needs In Smallholder Farmers In Nigeria. A Pilot Study

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Abstract

This survey is one of the first to take an integrated approach, incorporating all aspects of smallholder family farming enterprises, rather than discrete tasks or farming activities separately. The sample of 197 households was stratified into four wealth categories and differences in needs between the categories are revealed. Interventions to address poverty, based on the findings of the survey, were identified, including, as the prime need, increasing agricultural productivity through the use of better hoes.

Index terms— Family, Farmer, Ergonomics, Poverty, Intervention.

1 Introduction

Nigeria, with almost 70% of its population living in absolute poverty (i.e less than N161/US\$ per day), is one of the poorest countries in the world. A poverty alleviation project has been set up to address poverty primarily by aiming to increase food self-sufficiency of rural families. It is estimated that only about half of the families achieve this and the situation is exacerbated by the families' desperate scarcity of resources. There is negligible use of fertilizer, agricultural tools (except hoes) or draught animal power, thereby making human labour particularly critical for agricultural production. Shortage of credit and lack of access to markets prevent families from obtaining food items to supplement their own production and whatever nature provides in the environment.

For most in Nigeria survival depends on establishing and harvesting their staple crops and, if the opportunity arises, generating income, from agricultural, domestic or other activities to cover the purchase of supplementary food and any other essential items. Nigeria is reasonably well endowed with the biophysical resources for crop production (although the quality of the soil varies considerably) so the key component in the survival strategy is human labour. It is essential to know how people spend their time and energy so that opportunities to raise production or expand income-generating activities can be identified. A participatory survey, followed by focus group meetings, collected this information.

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2 Participatory survey

A total of 197 households in three Districts were surveyed. There are differences between these Districts, particularly regarding the type of farming system, topography and infrastructure. Ndoki is upland whilst Idoma and Otukpo are coastal lowland, with Idoma having the best infrastructure. Households were selected to represent the different status of household heads (e. g married man, widow etc) at four levels of wealth/poverty (very poor, poor, medium, rich), according to the findings of the wealth ranking exercise previously undertaken within the project. It was not possible to include equal numbers for each ranking as they were not necessarily distributed appropriately in the communities (e. g in some communities there were no rich widows). The survey elicited, through semistructured interviews, information on tasks, tools and equipment, together with associated problems, for the three main areas of household enterprise-agricultural, extra-agricultural (i. e beyond crop production) and domestic and domestic activities. For each household, four database tables were compiled, one for each of

44 the three areas given above and one containing any constraints reported concerning manual labour. The three
 45 areas of activity included many different tasks-16 agricultural, 8 domestic and 63 extra-agricultural, but these
 46 could be reduced to 11, 8 and 20 respectively by combining those that were very similar and by disregarding
 47 those (mainly extra-agricultural) that were pursued by less than five households (e. g tailoring).

48 It was possible to create an inventory of the household ownership of tools and how they are used. This helped
 49 identify shortages and inadequacies, which could be subsequently confirmed at focus group meetings, and which
 50 might indicate opportunities for interventions to raise between production constraints, problems experienced and
 51 tool ownership.

52 3 III.

53 4 Results and discussion

54 The most frequently cited constraint on agricultural production for all households in the sample was weeding
 55 (29%), followed by cultivation (22%); the least frequent was planting slightly different pattern emerges, as shown
 56 in Fig 1 ?? From fig 1 it can be seen N hat for the very poor cultivating, rather than weeding is the most
 57 frequently cited constraint. For the rich,

58 5 (G)

59 weeding is by far the most commonly cited constraint, followed by harvesting, which does not appear to present
 60 any constraint to widows or the very poor. It would, therefore, seem that poorer families face their greatest
 61 difficulties in preparing their land for cropping, access to labour and better tools and equipment. So would be
 62 less constrained by land preparation and would be likely to crop larger areas. Constraints then arise at weeding
 63 and harvest times in managing these large areas.

64 Ownership of agricultural tools and equipment in the participating household was limited. Eleven types were
 65 identified but, for most of these, ownership was not widespread. For the hoes (n=255) and sacks (n=220) averaged
 66 more than one per household. The household use of tools and equipment for agricultural tasks is summarized in
 67 Table 1. As can be seen from Table 1, the three items used most were the large hoe, the small hoe and the large
 68 cutlass. As is shown in Table 2, the households which cultivated and reported cultivation as a constraint had fewer
 69 large hoes and more small hoes than the households which did not. A similar finding on hoe size did not apply to
 70 households reporting weeding to be a constraint. Table 2 also shows a breakdown of how labour is provided by
 71 the households reporting constraints or not with these two tasks. It may be significant that cultivation is done
 72 by women alone in a greater proportion of the households reporting cultivation to be a constraint.

73 The 20 most common extra-agricultural activities and their distribution according to the four wealth rankings
 74 are given in Fig 2 ?? These activities are undertaken primarily for income generation and it can be readily
 75 seen from fig 2 that families of different wealth ranking take advantage of different opportunities. The rich, for
 76 example, are carpenters, administer traditional medicine and sell rice (which they have grown). The very poor
 77 sell wood, drinks and charcoal-all of which they can do with a minimum investment in equipment and by using
 78 raw materials freely available in the environment. The households in between tend to generate income by growing
 79 and selling cash crops, such as tomatoes, and commodities that they can harvest from the environment such as
 80 coconuts and the products of hunting and fishing.

81 IV.

82 6 Conclusions

83 The survey revealed that the constraints on agricultural production and the opportunities for incomegeneration
 84 depend on the wealth ranking of the household. The poorest cite cultivation as their main constraint, and their
 85 efforts to generate income are restricted by their own limited resources. This survey has enabled interventions
 86 to be better targeted to the needs agricultural production was confirmed at focus group meetings and led to an
 87 intervention aimed at increasing the availability of locally fabricated, large hoes of the design preferred by the
 88 farmers (with sockets rather than tangs).

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Figure 1: Figure 1 :

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Task	Large hoc cutlass	Small Sickle cutlass	Small Knife	axe Shell	large Sieve	Sack	Containers (general)		
Land clearing	13	4	76	71	-	-	-	-	-
Cultivating	84	57	-	-	-	-	-	-	-
Ridging	26	12	4	9	-	-	-	-	-
Seedbed	17	15	1	5	-	-	-	-	-
Planting	42	41	-	-	-	-	-	-	-
Transplanting	4	15	-	22	-	-	11	-	-
Weeding	61	119	-	-	-	-	-	-	-
Harvesting	45	69	-	31	6	11	44	57	22
Transport	-	-	-	-	-	-	-	-	-
Construction	3	-	21	23	-	-	-	-	-

Figure 2: Table 1 :

2

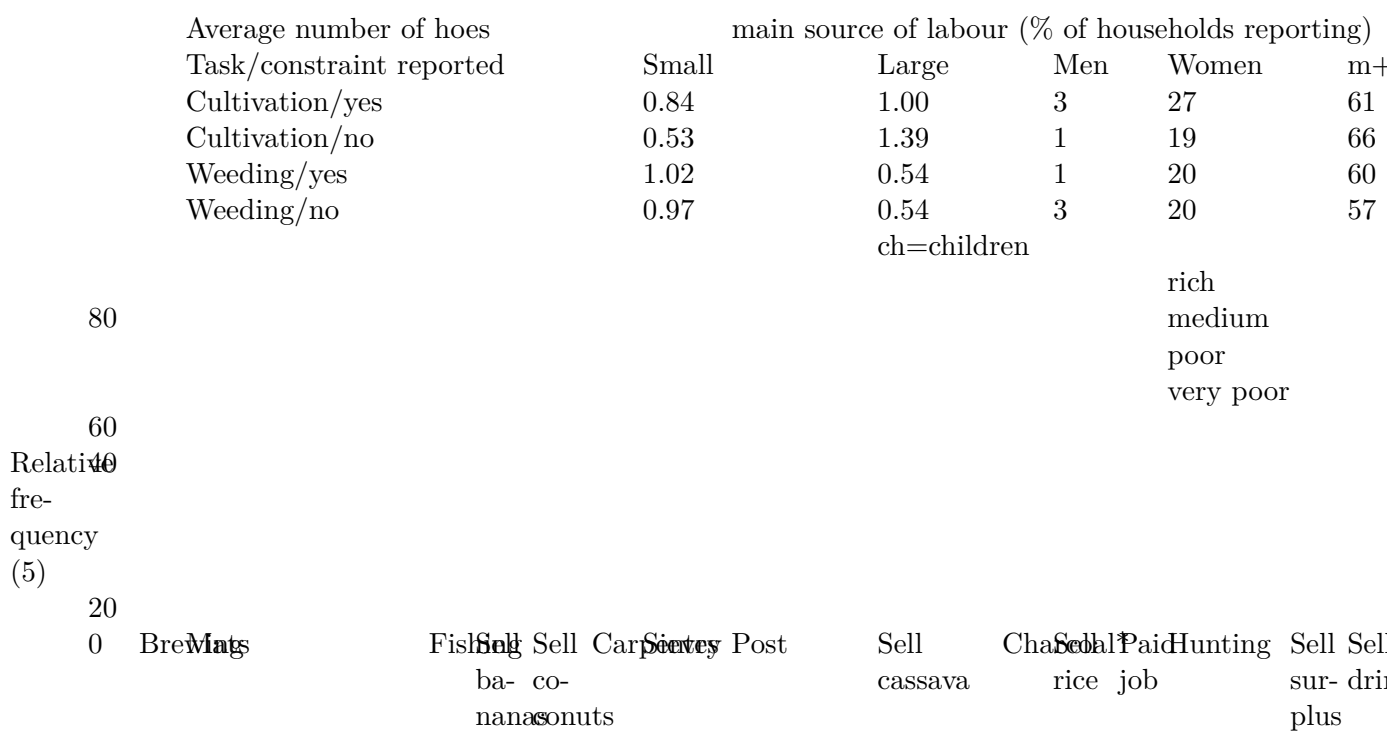


Figure 3: Table 2 :