

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

**HOUSEHOLD LABOUR ALLOCATION ON
SMALL DAIRY FARMS
IN EASTERN JAVA, INDONESIA:**

Implications for Gender Roles

HARI DWI UTAMI

1999

**A Thesis Presented in Partial Fulfilment of the
Requirements for Degree of Master of Applied Science in
Rural Development at Massey University**

ABSTRACT

The study was carried out in Andonosari village, East Java, Indonesia to investigate the household labour pattern of small-scale dairy farmers. The objectives were to: (a) investigate the pattern of the household labour allocation; (b) examine the earning contribution of dairy farming to the total of household income; and (c) quantify the role of gender in dairy farming activities. Time use patterns for household labour were computed as the time spent on work (dairy farming and non-dairy farming, including on- and off-farm activities). Interviews were conducted separately with the husband, wife, and family members aged 15-64 years for 50 households. Households were classified into three strata based on the number of dairy cattle farmed: strata 1 (with fewer than 3 animal units (AUs)), n=16; strata 2 (with 3 to 5 AUs, n=18); and strata 3 (with more than 5 AUs, n=16). Descriptive, univariate, bivariate and multivariate analyses were performed using SAS package.

Results showed that household labour for income generating activities was allocated more to dairy farming compared to the farm and non-farm work. Females allocated one third of total time to income generating activities, with most of the time devoted to dairy farming activities, while males tended to allocate more time to non-dairy farming activities. The household labour requirement in dairy farming per animal unit decreased as herd size increased, thereby allowing more time for non-dairy activities. Female participation was most evident in feed preparation and feeding, whereas the predominant male activity was forage collection for the dairy cattle. The size of the landholding had no impact on household labour allocation to dairy farming activities. An increase in household income and dependency ratio had a minor impact on household labour requirement in dairy farming. Non-dairy farming activities contributed about two-thirds to household income, the majority from apple farming. The income of household labour per animal unit tended to decrease with an increase in herd size. Variable costs accounted for 74% of the total expenditure in dairy farming, with majority purchases being concentrates. Fixed costs were 26% of total costs, and the major item was depreciation (8%).

It is suggested that farmers, including both men and women, should be trained to be more efficient in allocating household labour to dairy farming activities, and in managing the feeding of dairy cattle to achieve high productivity and income. There is substantial scope to increase herd size and increase labour efficiency in dairy farming.

Key words : Household labour, gender, dairy farming, non-dairy farming.

Title : "Household Labour Allocation on Small dairy Farms in Eastern Java, Indonesia: Implication for Gender Roles."

Author : Hari Dwi Utami

Degree : Master of Applied Science (Rural Development)

ACKNOWLEDGEMENTS

Praise be to Allah Almighty, the most Gracious, the most Merciful, with whose help I have been able to complete my studies.

I would like to thank to my Supervisors: Dr Ganesh Rauniyar, Associate Professor Stephen Morris, and Associate Professor Alex Chu for their guidance, encouragement, patience, and for providing constructive ideas which made the completion of this thesis possible.

I am grateful to the New Zealand Official Development Assistance (NZODA) programme, Ministry of Foreign Affairs and Trade, Wellington, New Zealand for the Student Scholarship.

My gratitude is extended also to the Indonesian Government for allowing me to study in New Zealand.

Finally, I want to express my greatest thanks and deepest gratitude to my mother, my sisters, brothers and niece for their prayers, enduring love, and encouragement during my studies.

TABLE OF CONTENTS

	Page
Abstract	i
Acknowledgements	ii
Table of Contents	iii
List of Tables	vi
List of Figures	ix
CHAPTER 1 INTRODUCTION	1
1.1 Introduction	1
1.2 Background and Problem Statement	2
1.3 Objectives of the Study	3
1.4 Trends in Dairy Cattle Number and Productivity	3
1.5 Importance of the Study	5
1.6 Limitation of the Study	5
1.7 Thesis Outline	6
CHAPTER 2 LITERATURE REVIEW.....	7
2.1 Theory of Time Allocation in the Household	7
2.2 The Weaknesses of the Time Allocation Model.....	13
2.3 Empirical Studies on Farm Household Time Allocation	14
2.3.1 Household Labour Allocation.....	14
2.3.2 The Division of Labour in Dairy Farming Activities by Gender	17
2.4 Determinants of Household Labour Allocation	19
2.4.1 Human Capital	19
2.4.2 Health	21
2.4.3 Household Characteristics	21
2.4.4 Labour Market Characteristics	25
2.5 The Advantages of Dairy Farming.....	26
2.5.1 Household Income and Employment	26
2.5.2 Poverty Alleviation	27

	Page
2.5.3 Nutritional Status	28
2.5.4 Children's Education.....	28
2.5.5 Farming Sector.....	29
2.5.6 Other Advantages	30
2.6 Summary	31
CHAPTER 3 METHODOLOGY	33
3.1 Theoretical Framework	33
3.2 Area Selection	40
3.2.1 Study Area	41
3.3 Selection of Respondents	43
3.4 Data Collection	46
3.4.1 Data Collected from Earlier Research	49
3.5 Analytical Methods	53
CHAPTER 4 RESULTS AND DISCUSSION	54
4.1 Characteristics of Respondents	54
4.2 Household Labour Allocation to Economic Activities per Farm Size	55
4.2.1 Household Labour Allocation to Economic Activities per Animal Unit...59	
4.2.2 Household Labour Allocation to Dairy Farming Tasks	61
4.3 The Source of Household Income	65
4.3.1 The Source of Household Income per Animal Unit	69
4.3.2 Household Income Generated from Dairy Farming	72
4.3.3 The Annual Expenditure Incurred in Dairy Farming Activities	75
4.3.4 The Annual Expenditure Incurred in Dairy Farming Activities Per AU	79
4.4 Interrelationships between Factors Affecting Household Labour Allocation to Dairy Farming	82
4.4.1 Bivariate Analysis	82
4.4.2 Determinants of Household Labour Allocation to Dairy Farming Activities.....	84

	Page
4.4.3 Impacts of Changes in Dairy Cattle Numbers and Total Household Income on Labour Requirements in Dairy Farming	85
4.4.4 Interrelationship between Factors Affecting Household Labour Allocation in Dairy Farming per AU Basis.....	86
4.4.5 Impacts of Changes in Dairy Cattle Numbers and Total Household Income on Labour Requirements in Dairy Farming per AU Basis.....	87
4.5 Interrelationships between Factors Affecting Dairy Farming Net Income per AU Basis.....	88
4.5.1 Bivariate Analysis	88
4.5.2 Factors Explaining Net Income per AU Basis.....	89
4.5.3 Prediction of Change in Total Costs of Animal Feeding and Dependency Ratio on Net Income of Dairy Farming per Animal Unit.....	90
 CHAPTER 5 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	93
5.1 Summary	93
5.2 Conclusions	102
5.3 Recommendations	104
 REFERENCES	105

LIST OF TABLES

Table		Page
1.1	The composition and development of dairy cattle, milk production and the milk co-operatives of dairy farmers (1981-1990).....	4
1.2	Dairy farming performance in Andonosari village	5
3.1	Household labour allocation	50
3.2	Household's Income.....	51
3.3	Factor influencing household labour allocation in dairying	52
3.4	The perceptions of dairy farmers	53
4.1	Household labour allocation to economic activities by stratum (farm size) and gender for small dairy farms at Andonosari village, Pasuruan, East Java, Indonesia (hours/year).....	57
4.2	Household labour allocation to economic activities by stratum (farm size) and gender for small dairy farms at Andonosari village, Pasuruan, East Java, Indonesia percentage).....	58
4.3	Household labour allocation to economic activities by stratum (farm size) and gender for small dairy farms at Andonosari village, Pasuruan, East Java, Indonesia per animal unit (hours/year).....	60
4.4	Annual time allocation of household labour to dairy farming tasks by stratum and gender at Andonosari village, Pasuruan, East Java, Indonesia (hours/year)	62
4.5	Annual time allocation of household labour to dairy farming tasks by stratum and gender at Andonosari village, Pasuruan, East Java, Indonesia per animal unit (hours/year)	63
4.6	Annual household labour allocation by stratum and gender to small dairy farm activities at Andonosari village, Pasuruan, East Java, Indonesia (percentage).....	64

Table	Page
4.7	Sources of annual household income by stratum of small scale dairy farming at Andonosari village, Pasuruan, East Java, Indonesia ('000 Rp/year)67
4.8	Sources of annual household income by stratum of small scale dairy farming at Andonosari village, Pasuruan, East Java, Indonesia (%).....68
4.9	Sources of annual household income by stratum per animal unit of small dairy farming at Andonosari village, Pasuruan, East Java, Indonesia ('000 Rp/year)70
4. 10	Sources of annual household income by stratum per animal unit of small dairy farming at Andonosari village, Pasuruan, East Java, Indonesia %)....71
4.11	Sources of annual household income from dairy farming by stratum at Andonosari village, Pasuruan, East Java, Indonesia ('000 Rp/year).....73
4.12	Sources of annual household income from dairy farming by stratum at Andonosari village, Pasuruan, East Java, Indonesia (%)74
4.13	The annual expenditure incurred in dairy farming activities by stratum at Andonosari village, Pasuruan, East Java, Indonesia ('000 Rp/year)77
4.14	The annual expenditure incurred in dairy farming activities by stratum at Andonosari village, Pasuruan, East Java, Indonesia (%).....78
4.15	The annual expenses incurred in dairy farming activities by stratum at Andonosari village, Pasuruan, East Java, Indonesia per animal unit ('000 Rp/year)80
4.16	The Annual expenses incurred in dairy farming activities by stratum at Andonosari village, Pasuruan, East Java, Indonesia per animal unit (%)81
4.17	Bivariate analysis of household labour allocation variables in dairying83
4.18	The impact of a change in cattle number and in total household income on household labour requirements in dairy farming activities86

Table	Page
4.19	The impact of a change in cattle numbers and in total household income on household labour requirements in dairy farming activities per animal unit basis.....88
4.20	Correlation analysis of net income on dairy farms per animal unit.....89
4.21	The impact of increasing total costs of animal feeding and dependency ratio on net income of dairy farming per AU.....91
4.22	The impact of decreasing total cost of animal feeding, and dependency ratio on net income of dairy farming per AU.....92

LIST OF FIGURES

Figure		Page
3.1	Conceptual model of time allocation amongst household labour in small scale dairy farming	34
3.2	Population distribution based on work	41
3.3	Land distribution based on crops planted	42
3.4	Selection of respondents.....	45
3.8	Data collection strategy	48