

Socio-economic Factors Associated with the Adoption of Applied Nutrition Programme (ANP) by Households in a Malaysian Mukim¹

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Key words: Socio-economic Factors; Adoption; Applied Nutrition Programme (ANP), Households, Malaysian Mukim.

RINGKASAN

Satu penyelidikan telah dijalankan untuk mengkaji: (i) Sebahagian daripada faktor-faktor sosio-ekonomi yang mempengaruhi penerimaan amalan ANP oleh penduduk kampung, (ii) kaitan antara faktor-faktor itu terhadap penerimaan amalan ANP, (iii) yang mana di antara faktor-faktor itu boleh disenaraikan mengikut keutamaan terhadap penerimaan amalan ANP, dan (iv) beberapa masalah yang terlibat semasa menerimanya amalan ANP itu. Didapati bahawa amalan-amalan kesihatan mencapai kadar penerimaan yang lebih tinggi dari amalan-amalan pengeluaran makanan. Juga didapati faktor-faktor seperti pencapaian pelajaran suami/isteri dan saiz keluarga, umur, sikap terhadap idea dan amalan-amalan ANP dan keahlian kelab adalah mempengaruhi penerimaan amalan ANP. Masalah-masalah yang dihadapi adalah seperti kekurangan tenaga, modal, tanah dan masa, serta sikap yang negatif terhadap idea dan amalan-amalan ANP dan beberapa faktor alam sekitar.

SUMMARY

A study was conducted to determine: (i) some selected socio-economic factors related to the adoption of ANP practices by rural households; (ii) the relationships of these selected factors in the adoption of ANP practices; (iii) which of the factors would make significant contributions to the non-adoption of ANP practices by the households, and (iv) some of the reasons for the non-adoption of ANP practices.

It was found that the adoption of health practices was of a higher level than that attained in food practices. Five out of fourteen socio-economic factors were found to contribute significantly towards adoption of ANP practices. These factors were: educational attainment; family size; age; attitude towards ANP ideas and practices; and club membership. The lack of human and non-human resources such as land labour, capitale and time, an unfavourable attitude towards ANP ideas and practices and some environmental factors were among the common problems encountered during the adoption process.

INTRODUCTION

The Applied Nutrition Programme (ANP) is an educational programme aimed at bettering the standard of living of rural people through improving nutritional status, teaching better utilization of available resources, setting up of nutrition services, assisting in farming practices, health services and other development activities with the help of government agencies. Members of the rural communities involved in the programme are trained in agricultural practices to increase food production while nutrition education, which is given through such channels as

women's clubs, schools, health centres and youth groups, aims at teaching rural folk to make better use of available food supplies (McNaughton, 1975). Applied Nutrition Programmes are also designed to produce changes in the patterns of food production, particularly in distribution and consumption of food by updating knowledge and effecting changes in attitudes towards food in the hope that infant and child mortality rates, would consequently be reduced. The successful implementation of the ANP would, therefore, lead to better growth and development of children; and improve the vitality and health of adults (FAO, 1972).

¹ Part of Thesis submitted for the degree of Master of Science, University of Philippines at Los Banos, College, Laguna, Philippines. 1978.

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Origin and development of ANP

ANP, a world-wide programme, was launched simultaneously in different regions of the world in the late 1950's. The concept was developed and initiated when the Food and Agricultural Organization (FAO), the World Health Organization (WHO) and the United Nations International Children's Education Fund (UNICEF) realized that the nutrition projects they had supported had not brought about the expected improvement in food availability and nutritional requirements.

The ANP concept involved the coordination of programmes pertaining to health, agriculture, education, community development, information and local government on the rationale that nutrition problems stem from a variety of causes and, requires a multidisciplinary approach.

ANP was launched in Africa (1967), India (1959), Brazil (1960), Philippines (1965), Korea (1967) and Malaysia (1969).

ANP in Malaysia

In Malaysia, ANP was launched towards the end of the First Malaysia Plan (FMP, 1965-1970) in order to meet one of the objectives of the New Economic Policy (NEP). It anticipated the Applied Food and Nutrition Project (AFNP) (TMP, 1976-80) which integrated and coordinated food production, nutrition education and home economics, health, sanitation and supplementary feeding programmes.

The ANP in Malaysia spells out specific objectives (Majallah ANP, 1974): These include: the improvement of the nutritional status of rural people especially infants, toddlers, school children and expectant mothers; the increase of food production and income of family units; the improvement of health by controlling communicable diseases through immunization and improvement of environmental sanitation; the co-ordination of activities of various agencies engaged in community development; the implementation of more meaningful government projects; follow-up of government sponsored activities through the community development committees and maximising participation of the rural people.

BEHAVIOUR TOWARDS INNOVATION

The success or failure of the ANP in Malaysia depends very much on the acceptance and adoption of the innovations implicit in the ideas and concepts of the programme. Research on

acceptance and adoption of innovations in the last two decades has been mainly confined to agricultural innovations and provide an insight into an understanding of clientele behaviour towards innovation. Rogers and Shoemaker (1972) have suggested that the innovation-decision process consists of four clear-cut stages, namely, *knowledge*, where the individual is exposed to the existence of the innovation and understands its functions; *persuasion* when the individual forms a favourable or unfavourable attitude towards the innovation; *decision* when the individual engages in activities which lead to either an adoption or rejection of the innovation; and *confirmation* when the individual seeks reinforcement for this decision in regard to the innovation; a reversal of decision may take place at this stage if conflicting messages about the innovation or because of loss of interest results from inadequate competency or the lack of support from peers. Pineda (1969), Ariffin (1975), Alang (1977), Kamsah (1977) have indicated the many socio-economic factors that affect the rate of adoption of innovation among the Filipino and Malaysian rural populations. These include factors such as (a) the individual's knowledge and conception of the innovation and certainty of desired results, (b) the individual's perceived need for changes in farming matters, (c) attitude towards and contacts with persons and agencies disseminating information about farm matters through extension programme, farm journals and radio stations, (d) the extent of acceptance of formal education and scientific knowledge as essential requirements for successful farming as opposed to reliance upon personal experience and folk knowledge and (e) levels of aspiration as related standards of living, size and type of farming operations desired and social status aspirations.

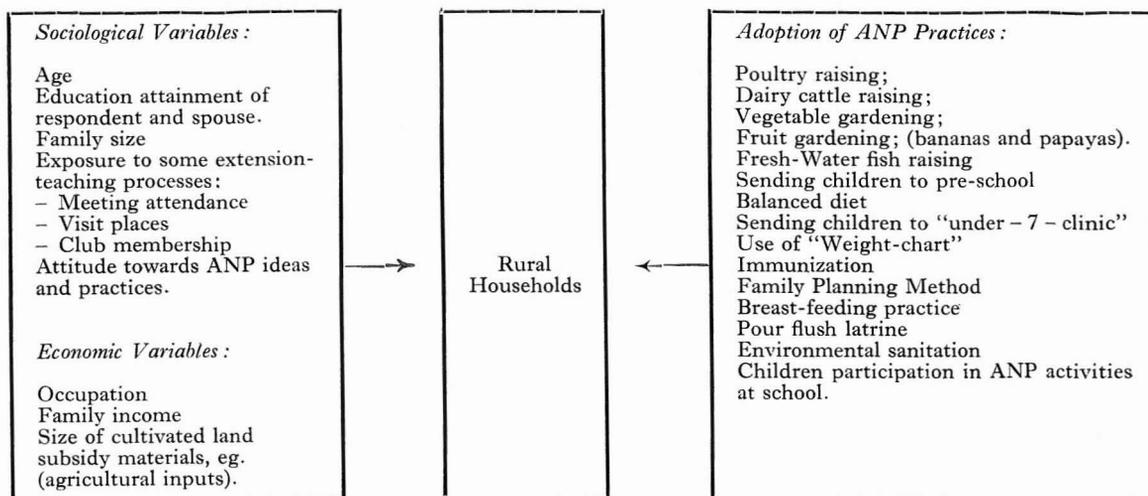
CONCEPTUAL FRAMEWORK

The present study sets out to study the extent to which socio-economic factors affect the adoption of innovations associated with the Malaysian ANP. The conceptual framework is as illustrated in Fig. 1. The socio-economic factors affecting rural households were studied in conjunction with the eventual acceptance of the practices of the ANP programmes. The socio-economic factors were regarded as sociological or economic *independent variables* which influenced the ultimate adoption of practices spelt out by the ANP programme. In this study the ANP practices were taken to be the *dependent variables*.

SOCIO-ECONOMIC FACTORS ASSOCIATED WITH ANP

INDEPENDENT VARIABLES
(Socio-Economic)

DEPENDENT VARIABLES
(Adoption of ANP practices)



The *sociological variables* studied were: age; educational attainment of respondent and spouse; family size, exposure to extension-teaching processes (attendance at meetings, visits, club membership); and attitude towards ANP ideas and practices. The *economic variables* studied were: occupation; family income; size of cultivated land, and subsidy materials (e.g. agricultural inputs).

The *dependent variables* consisted of the 15 recommended practices. These were: poultry raising; dairy cattle raising; vegetable gardening; fruit gardening (bananas and papayas); fresh-water fish raising; sending children to pre-school; balanced diet; sending children to "under-7 clinics"; use of "weight-chart"; immunization; family planning method; breast-feeding practice;

pour-flush latrine; environmental sanitation; and children's participation in ANP activities at school.

The *independent variables* (socio-economic factors) were correlated with the overall levels of adoption of the *dependent variables* (ANP recommended practices); and the size of the correlation coefficients served to evaluate the degree of association between each socio-economic factor with the overall ANP recommended practices scores.

METHODOLOGY

The study was conducted in six villages in Mukim Tanjung Dua Belas, District of Kuala Langat, Selangor. This district was selected

TABLE 1

Demographic data of six selected villages in Mukim Tanjung XII, Kuala Langat*

Village	Total population	Number of families	Respondent	% of total respondents
Kampung Jenjarum	2,816	469	33	25.38
Kampung Sungai Kelambu	1,432	239	14	10.78
Kampung Sungai Lang Baru	685	114	10	7.69
Kampung Bukit Changgang	2,397	400	23	17.69
Kampung Labuhan Dagang	2,478	413	25	19.23
Kampung Olak Lempit	2,493	415	25	19.23
Total	12,301	2,050	130	100.00

* District Office, Banting, Kuala Langat, Selangor, Malaysia. Census made in 1975.

because it was an example of the Malaysian programme which was implemented and co-ordinated at district level and the tasks of various development agencies were integrated. One hundred and thirty heads of households were randomly chosen by the systematic random sampling procedure. The size of samples from each village was proportional to the size of the total population (Table 1).

The data were gathered through personal interviews in January 1978.

The statistical methods used in the data analysis were: (i) descriptive statistics such as summation, percentages and mean scores on the characteristics of the respondents; (2) the Pearson product moment correlation coefficient; and (3) a stepwise multiple regression analysis (SMRA). The SMRA was used in this study merely to determine the relative importance of each of the variables and in explaining the variance in the dependent variable.

Hypotheses

The following hypotheses were formulated:

Hypothesis 1: There is a positive relationship between the adoption of ANP practices and the social variables – age, educational attainment, length of residence, family size, exposure to some extension teaching processes and attitude towards ANP ideas and practices.

Hypothesis 2: There is a positive relationship between the adoption of ANP practices and the economic variables – occupation, family income, size of cultivated land and subsidy facilities received in the form of agricultural inputs such as fertilizer, improved seeds and other planting materials, day-old chicks, calves, lime and credit.

RESULTS

Characteristics of Respondents

About half the number of respondents (47.7%) were between 36 to 50 years old, the average age being 46.2 years. Majority (63.1%) had been to elementary school and had between one to six years of formal education. The average number of years of schooling of heads of household was 3.8 and that of their spouses was 2.7. Slightly more than half the number of respondents (55.4%) had lived at their present address for more than 20 years, the average length of residence being 23.9 years. The average family size was 6.7 persons. A majority of families (89.2%) had dependent children below the age of 18 years.

A Likert type five-point scale indicated that the majority of the respondents (62.3%) showed a favourable attitude towards ANP ideas and practices. In regard to occupation, 62.3% were self-employed, either in farming or small scale business. Most of the spouses (70.0%), however, were full-time homemakers and about one-fourth (26.2%) were self-employed especially in coffee growing. The average family income was \$4323.01 per year and the average size of cultivated land was 3.1 acres, mostly self-owned. Since the majority of the respondents were engaged in farming, a large proportion of them (68.5%) had received subsidy materials from the government on at least one occasion. The subsidy facilities were mainly agricultural inputs in the form of fertilizer, lime, day-old chicks, planting materials, calves and credit from the Department of Agriculture.

Adoption of ANP practices

The study showed that two out of 15 ANP practices had a 100% level of adoption. These were: standard immunization for children against tuberculosis (BCG), polio and small-pox; and a balanced diet for their families. In the case of balanced diet, the findings indicated that every family in the area generally consumed the recommended daily food composition. However, no details of the nutritional composition of the individual intake of protein, carbohydrate, fat, minerals, and vitamins, and the biological effect of the food to the human body were taken into account.

Other ANP practices which were widely adopted were planting of short term fruits (papayas and bananas, 84.6%); and vegetable gardening (53.7%). Most of the ANP health practices were also widely adopted. These practices included sending children to "under-7 clinics", use of the "weight-chart" technique for determining the children's health (77.7%), breast-feeding practice (75.4%), good environmental sanitation (61.5%), and use of the pour-flush latrines (46.5%).

Dairy cattle and fresh-water fish raising had the lowest levels of adoption (3.9% and 0% respectively). These two activities, designed to increase protein supply for the villagers, seemed to have been unsuccessful.

The involvement of children in ANP practices at school was encouraging. As seen from Table 2, 54.0% of the children were involved in activities such as vegetable gardening, poultry raising and the supplementary feeding programme.

SOCIO-ECONOMIC FACTORS ASSOCIATED WITH ANP

TABLE 2

ANP practices and the Levels of Adoption
(N = 130)

Practice	Adoption percentage
Poultry raising	32.31
Dairy cattle raising	3.85
Vegetable gardening	53.85
Short-term fruit gardening (papayas and bananas)	34.62
Fresh-water fish raising	0
Send children to pre-school	36.15
Balanced diet	100.0
Send children to "under-7-clinics"	80.77
Use of "weight-chart"	77.69
Immunization	100.00
Family planning method	29.23
Breast-feeding practice	75.37
Pour-flush latrine	60.00
- full use of Pour-flush latrine	89.74
Environmental sanitation	
- good	61.54
- fair	33.08
Children's participation in ANP activities at school	53.85

Relationships Between Socioeconomic Factors with Adoption

The relationships between socioeconomic factors and the adoption of ANP practices are presented in Table 3. In this table the socio-economic factors were ordered according to their

TABLE 3

Zero-order Correlation of Selected Independent Variables with Adoption of ANP Practices.

Variables	Coefficient of Correlation (Pearson)
<i>Sociological</i>	
Age	-0.312**
Educational attainment of respondent	-0.198*
Educational attainment of spouse	0.334**
Length of residence	-0.051
Family size	0.174*
Exposure to some extension-teaching processes:	
- meeting attendance	-0.105
- visit places	0.051
- club memberships	0.243*
Attitude towards ANP ideas and practices	0.304*
<i>Economic</i>	
Occupation of respondent	-0.048
Occupation of spouse	0.011
Family income	0.123
Size of cultivated land	-0.118
Subsidy materials	
Subsidy materials (e.g. fertilizer, planting materials, lime, etc.)	0.021

** Significant at 0.01 per cent.

* Significant at 0.05 per cent.

importance, in their ability to explain the variance in the independent variable. A stepwise multiple regression analysis was used to determine the order.

As evidenced in Table 3, there were only six social factors which were found to be significantly related (either positively or negatively) to the adoption of ANP practices. The factors were age, educational attainment of respondent, educational attainment of spouse, family size, club membership and the attitude towards ANP ideas and practices. Therefore, the null hypothesis of no relationship between the social variables and the level of adoption is rejected at the 0.01 level. On the other hand, the findings do not warrant the rejection of the null hypothesis of no relationship between the economic variables and the adoption levels of ANP practices.

Moderate relationships were found between the variables: age, educational attainment of a respondent's spouse and attitude towards ANP ideas practices. Age was found to be negatively related to adoption. The other three variables showed low association. The relationship between educational attainment of husband, family size and club membership with the adoption of ANP practices were 0.198, 0.174 and 0.243 respectively.

Other social factors, either positive or negative, were found to have negligible or low association with the adoption of ANP practices in the study. Their associations, however, were statistically insignificant.

The interrelationships among the independent variables used in this study revealed that a number of these variables were significantly interrelated with one another. The summary of interrelationships between these variables is presented in Table 4. As evidenced from the data, age of the respondents, for instance, was found to be statistically related to educational attainment, educational attainment of the spouse, family size, club membership, attitude towards ANP practices, occupation and family income. Of these variables, family size, club membership and family income were found to be positively related to age; the strength of relationship, however, was fairly weak. The other variables had negative relationships with age, the relationship ranging from low to substantial.

The educational attainment of a respondent was also found to interrelate with other five variables in the study. Likewise, these variables were found to relate with educational attainment of the spouse.

TABLE 4

Matrix of intercorrelation among dependent and independent variables

	ANP	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14
ANP		-0.312**	0.198*	0.334**	0.051	0.174*	-0.105	0.051	0.243*	0.304*	-0.048	0.011	0.123	-0.118	-0.021
X1			-0.535**	-0.470**	0.125	0.254*	0.044	0.062	0.225*	-0.297**	-0.178*	0.023	0.251*	0.032	0.040
X2				0.322**	-0.191*	-0.329**	-0.029	0.010	-0.176*	0.164	0.327**	-0.002	-0.082	-0.004	-0.077
X3					-0.060	-0.234*	0.059	-0.092	-0.275*	0.174*	0.115	0.144	-0.008	0.129	0.014
X4						0.128	-0.086	0.012	-0.054	-0.039	0.018	0.079	0.002	0.198*	-0.052
X5							0.288**	-0.020	-0.064	0.089	0.024	-0.004	-0.012	-0.019	0.195*
X6								0.011	-0.123	0.130	0.044	0.044	-0.001	0.095	0.207
X7									0.189*	-0.017	-0.049	-0.015	0.033	0.026	0.041
X8										0.222*	-0.222*	-0.068	0.099	-0.189*	-0.007
X9											0.164	0.074	-0.275*	0.151	-0.125
X10												0.121	0.001	0.166	0.058
X11													0.102	0.048	0.088
X12														-0.102	0.041
X13															0.73

ANP - Applied Nutrition Programme

X1 - Age

X2 - Educational attainment of respondent

X3 - Educational attainment of spouse

X4 - Length of residence

X5 - Family size

X6 - Frequency in attending meeting

X7 - Visit places

X8 - Club membership

X9 - Attitude towards ANP ideas and practices

X10 - Respondent's occupation

X11 - Spouse's occupation

X12 - Family income

X13 - Size of cultivated land

X14 - Subsidy facilities

** - Significant at 0.01 per cent

* - Significant at 0.05 per cent

DISCUSSION

The findings of this study can only be generalized as they pertain to Mukim Tanjung XII of Kuala Langat District; they are, however, useful in providing some insights into the problems of the adoption of ANP practices in Peninsular Malaysia.

Economic Variables

The findings indicate that none of the selected economic variables had a significant relationship with the adoption of ANP practices, positively or negatively.

The findings show that occupation and total family income were not significantly related to the adoption of ANP practices. It is interesting to note that the income of households in this district averaged \$360.25 p.m. which was considerably above the reported "poverty line" of \$125.00 in 1974 (Statistics Department, 1975). It was found that the majority of the self-employed villagers had at least one-half acre of cash-crops such as coffee, oil palm or coconut from which income was derived. Despite this economic situation it was observed that a certain amount of malnutrition existed in the district due to mismanagement of economic resources (Castillo, 1978).

Sociological variables

The findings showed that most of the sociological variables studied, apart from length of residence and exposure to extension teaching processes, had some degree of relationship with the adoption of ANP practices.

Age was found to have a significant but negative relationship with the adoption of ANP practices. This implies that the older the heads of households were the less prone they were to adopt ANP practices. On the average, heads of households were 46.2 years old, and were self-employed. In view of the influence they will continue to have in ANP practices in the future it would be desirable to involve heads of households more positively in ANP activities so that the present negative relationship trend between age and adoption of ANP practices can be reversed.

Educational attainment appears to be an important socio-economic factor that influences the development of a society. In this study, a positive and significant relationship between educational attainment and the adoption of ANP practices is suggested. Therefore, the intro-

duction of a community development programme such as the ANP will likely encounter fewer obstacles among those with high educational attainment. In cases where the educational level is low, special programmes such as adult education or non-formal education should be made available at the village level so that the less educated will have an opportunity to improve their knowledge, motivation and practical skills.

The findings also showed that a favourable attitude toward the concept of ANP significantly affected the adoption of ANP practices, confirming that a positive attitude orientates a person's behaviour, arouses interest and shapes his values and beliefs about ANP innovation before the recommended practices are translated into action and eventually adopted. Furthermore, a more convincing extension strategy should be formulated so that a more positive attitude towards ANP could be achieved. An interpersonal extension approach could be effective at this stage.

It was also found that family size was related somewhat to the adoption level of ANP practices. While adoption may indicate the acceptance of innovation, it may not mean that all members of a family are involved in the innovation. It is assumed that in a farming community a bigger family will have more labour available; more food, too, will be needed; therefore the head of the farming household would be expected to intensify farming activities to offset the increase in cost of living by an increase in income. With bigger family size, the needs for health practices become greater in terms of sending children to pre-school, visits to clinics, immunization, use of pour-flush latrine, environmental sanitation, adequate food supply and intake to ensure that every individual in the family is healthy. Therefore, family size and level of adoption tend to vary in the same direction.

The high percentage of children participating in school-sponsored ANP activities would indicate that children in the District of Kuala Langat were orientated towards the improvement of living conditions. They were taught and encouraged by the teachers to be involved in the ANP activities. The involvement of children in ANP projects at school could serve an important means to achieve transfer of knowledge from the ANP committee to the parents, besides engendering good parent-teacher relationship for the benefit of the community as a whole.

Variation in adoption levels

There were apparent variations in the adoption levels of ANP practices. Food and agricultural production practices which aimed at self-sufficiency in food and increase in income, showed lower adoption levels than those pertaining to health practices. This was probably because families devoted most of their resources such as time, labour, land and capital to generating income through work. Respondents actually showed great interest in small scale production practices such as backyard gardening and improved poultry rearing; but due to several constraints these activities were not carried out successfully. The low level of adoption in livestock raising (Table 3), for example, would indicate that more intensive promotion of improved veterinary and animal husbandary services should be initiated to promote backyard poultry raising, meat and egg production, and raising of small-scale ruminants such as beef cattle, dairy cattle and goats.

CONCLUSION

This study shows that social factors such as the educational attainment of the respondent and spouse, family size, age, attitude towards ANP ideas and practices, and club membership did contribute more significantly towards the adoption of ANP practices than economic factors such as occupation, family income, size of cultivated land, and subsidy facilities received. While it is obvious that economic factors are of great importance in the implementation of the programme, ANP committees should give prior consideration to sociological factors so that the implementation activities would inevitably move towards achieving the objectives of the programmes. When decision to launch and ANP has been taken there should be adequate funds and other inputs; the success of any development programme depends largely on a careful analysis of factors which would directly or indirectly influence the attainment of the desired results. Although the ANP is usually supported by the United Nations and local governments in terms of services and materials, these resources will not always be forthcoming. Therefore, it is crucial that community participation in production be encouraged so that when foreign or local assistance fades out, local production will still continue because one of the final objectives of ANP is to produce a self-sustaining community.

ACKNOWLEDGEMENTS

The author wishes to express her appreciation to her adviser, Dr. Tito E. Contado, for his guidance and sustained encouragement throughout her research. Thanks are also expressed to the Southeast Asia Regional Centre for Research and Graduate Study in Agriculture (SEARCA) for the scholarship and to Universiti Pertanian Malaysia for study leave and assistance in research work.

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(Received 3 October 1978)