

CROP PRODUCTION AND UTILIZATION IN SOUTHERN MINDANAO

Napoleon D. Amoyen
Marilou M. Pacot

Introduction

Poverty is endemic and widespread in the world. Nearly 20 percent (19.6%) of the world's population of 5.6 billion live in absolute poverty¹, with 65 percent reported for Asian countries (Philippine Daily Inquirer : 1994,5). Philippine figures indicate more than half (60% or approximately 36 million) of the 60.5 million Filipinos (NSO 1990) live in the rural areas and are dependent on agriculture for their livelihood. Sixty-five percent of the rural population live in the lowlands and coastal areas while the rest are in the uplands. Various studies reveal that more than half of the rural families live below the poverty line (compared to only one-fifth of urban families). However, various development policies and programs of the Philippine government have been concentrated in the urban centers, mainly in Metro Manila, with the rural population consistently disadvantaged compared to their urban counterparts since the postwar years. Analyzing the nature, extent, and trends of rural poverty within the context of development, Sison and Varela inferred that "a great proportion of the poorest of the poor is found in the rural sector", citing both "the inherent and persistent socio-economic and political structures which exclude the poorest segments of the rural population from participating in productive economic

activity.² Such scenarios have thus sent the appropriate signals to both the public and private sector to address the needs of these marginal members of Philippine society caught in the vicious cycle of poverty and low productivity, lack of access to resources, and subsequently inequality.

The Southern Mindanao Agricultural Programme

As with other government and non-government organizations which have recognized the need to improve the farmers access to necessary resources, the Department of Agriculture, collaborating with various local government and non-government organizations, launched the SOUTHERN MINDANAO AGRICULTURAL PROGRAMME in January 25, 1990 in three (3) out of 52 watersheds zones in Southern Mindanao. Its area coverage includes three zones, namely: the Davao River Basin in Marilog, Davao City (Zone I), the Southern Slopes of Mt. Apo in Davao del Sur (Zone II); and, the Allah Valley/T'boli Homeland in South Cotabato (Zone III). As of March 1994, a total of 22 Key Result Areas (KRAs) from the three zones were identified, with 19 KRAs as operational, six of which are managed by the local government units (SMAP Community Profile Database). The 22 KRAs included 503 sitios that should be provided assistance by SMAP, with 303 sitios currently being served yielding a total of 13,562 households. Zone 3 revealed the highest number of households served (7,147), with Zone I, the least (1,883). These communities have undergone planning meetings where microprojects have started or about to start.

¹ Absolute poverty means not having the money to pay for food, shelter and education (PDI:1994,5).

² These consist of such factors as occupational correlates (agriculture-based occupations vis-a-vis those in non-agriculture), low agricultural productivity, unequal distribution of resources and unequal access to resources.

SMAP's primary goals consist of: a) improvement of the living condition and revenues of the upland farming communities; b) protection of the long-run development potentials of the area through intensification and diversification of upland agriculture, expanded use of environmentally-sound upland agricultural land technology, upgrading of basic rural infrastructure; and strengthening of local farmers' organization; and c) reduction of economic disparities between tribal and migrant communities. These can be attained through the programme components of micro- projects in rural production and rural infrastructure, the savings-based credit programme, institutional development through training and communication, research and studies, project operation and management, and technical assistance. It utilizes a participative, community-based approach which facilitates improvement of community skills in harnessing, managing and sustaining development resources.

The programme's outputs consists of the intensification and diversification of upland agriculture in SMAP-served areas using environmentally-sound and sustainable farming technologies, including the protection of watershed areas through agroforestry. SMAP likewise promotes the formulation and implementation of community-development plans based on a participative analysis of root problems by the communities served. Local organizations are thus encouraged to adopt community-based planning, management and extension techniques. The programme provides a viable revolving fund providing credit for agricultural and off-farm activities of SMAP-assisted upland communities. By project-end, SMAP focuses on the finalization of the guidelines, manuals on the SMAP development process, planning process, monitoring and evaluation, extension techniques and research.

Objectives of the Study

In 1992, at the start of the SMAP Implementation Phase, the programme developed a Benchmark Profile for each community assisted using Participatory Rural-Appraisal(PRA) techniques. The current study is intended to complement the 1992 data set, specifically focusing on the following directions:

1. Present the household profile of the respondents.
2. Determine the crop production-disposal activities of the farmer-households, and
3. Determine the household income and expenditure of the farmer-households.

Significance of the Study

The study will not only provide additional data about the farmer-households but will complement the SMAP data gathered through participatory data collection techniques.

Limitations of the Study

The study deals primarily with the description of the crop production-disposal activities and income and expenditures of the farmer-households in SMAP-served communities in Southern Mindanao.

Another limitation of the study is the reliability of the responses of the respondents. Recall problems and fatigue on the part of the respondents due to the length of the interviews(i.e. from one to two hours, depending on the capability of the

respondents to adequately recall farm-and-crop production activities for the last 12 months) are possible causes of inaccurate responses. The timeframe used in establishing the crop production-disposal activities, household income and expenditures was the previous year (i.e. 12 months prior to the survey). Likewise, the sample was based on the 1993 household listing provided by SMAP.

Methodology

The study used the descriptive approach, focusing on the crop production-disposal activities of the farmer-households, including their income, expenditures and food consumption patterns.

Initially, the sample was set at 400 households and proportionately allocated in the sampled sitios per zone, using the 1993 SMAP household lists from the sitios served. Sitios without household listings were thus eliminated in the sample. However, two weeks after the implementation of the data collection, SMAP realized the absence of sample sitios from KRA 4 of Zone 2. An additional sample of 66 households was subsequently added, increasing the sample to 466 households (indicating a confidence level of 95.8 percent). The final sample thus consisted of 101 household respondents from Zone 1, 213 from Zone 2 and 152 from Zone 3. These zonal figures revealed a confidence level ranging from 90.6 percent to 93.5 percent. The figures from the KRA level likewise resulted to a confidence level ranging from 67 percent to 88.3 percent. Table 2 provides the breakdown of the household population and sample, including the confidence levels by zones and KRA. The household-respondents were randomly chosen based on the 1993 SMAP list of households.

The Study Findings

The data collection (conducted from February 14 to March 13, 1994) was facilitated using an interview schedule translated into the vernacular and pretested among 12 upland farmers in sitios not served by SMAP as validity and reliability measures. To facilitate data collection, twelve (12) field interviewers were trained to conduct the field interviews. They were closely monitored to minimize field recalls. SMAP provided transportation support to facilitate access to the sampled sitios. Simple descriptive statistics such as modes, means, frequency and percentage distributions were utilized in the analysis of the data collected. Likewise, graphs were used in the data presentation. Furthermore, zonal and KRAs shows the dominance of the Visayans, i.e. the Cebuanos, Boholanos, Ilonggos, etc. over ethnic groupings. Such a trend holds true for all the KRAs in all zones except KRA 2 of Zone 1 and KRA 4 of Zone 3 where household members belong to tribal communities. Likewise, it is interesting to note that the respondents in all three zones were generally migrants- except for KRA 2 (71.4%) of Zone I and KRA 4 (66.7%) of Zone 3 where the majority of the respondents were of tribal origin. The varied ethnic origin suggests differences in the level of adoption of change among these uplander farmer-hoseholds. Such ethnic diversity likewise provides the directions for possible training and development programmes to assist upland dwellers.

Household Type and Size. The type of household is indicative of the concentration of economic gains relative to the economic welfare of the family. The more nuclear the family, the more concentrated the economic gains in the family compared to that in an extended family. The present study

revealed that the majority of the households were of the nuclear type- whether in the KRA, zonal or overall SMAP levels.

Household related studies further revealed that Filipino families tend to be large, averaging six members per household. The present study indicates similar findings in Zones 1 (5.86), 2 (5.56) and 3(5.71).(These findings, however, run counter to Sajise's argument that "upland communities are generally small in size because their subsistence economy and relative physical mobility cannot support a larger population.)

Household size variations are likewise evident among the KRAs in the three zones. KRAs 2 (6.34) and 4 (6.38) in Zone 1 revealed much larger families compared to KRAs 1 (5.6) and 3 (5.4). While KRA 5 in Zone 2 indicated the lowest family size of 4.93, the other KRAs revealed higher averages, ranging from 5.25 to 6.27 household members. KRA 1 of Zone 3 indicated the largest family size (6.24) compared to KRAs 2 (5.35), 3 (5.85), and 4 (5.53).

The respondents revealed large families, with Zone 1 the largest (5.86) and Zone 2 the lowest (5.56). KRA 5 of Zone 1 indicated the smallest family size (4.93) with KRA 4 of Zone 1 the largest (6.38).

Sex Distribution of Household Members. Male household members generally outnumbered their female counterparts in Zone 1 (53%), 2 and 3 (50.9% each), following closely the trend established by SMAP as of the second quarter of 1994 where there were 51 percent males compared to 49 percent females.

However, differing information was revealed in the KRAs per zone. While males from KRAs 2,3, and 4 of Zone 1

outnumbered their female counterparts, they were outnumbered, on the other hand, by their female counterparts in KRA 1. Males in KRAs 1,2,3, and 4 of Zone 2 likewise outranked females. However, females dominated in KRAs 5 and 7. Preponderance of males was further revealed in KRAs 1 and 3 of Zone 3 compared to KRAs 2 and 4 where females outnumbered the males.

Educational Attainment of Household Members. Education denotes the capacity of the household members to absorb and handle information to provide for their own interest and welfare. Likewise, it is a gauge for transferring knowledge and skills to ensure effective implementation of development work.

Survey findings a relatively high literacy rate among the respondents (73.2%). Both zonal and KRA figures similarly indicated high literacy rate among the respondents. Most of the household members in all three zones had completed primary education (i.e. 55% in Zone 1, 50.3% in Zone 2, and 365 in Zone 3).

On the other hand, it is also worth noting that some household members have not received any formal education at all, i.e. 1.7 percent in Zone 1, 1.14 percent in Zone 2, and 5.6 percent in Zone 3. It is likewise noticeable that all of the household members in KRA 4 of Zone 1 and KRA of Zone 2 have attended formal education.

Ages of the Household Members. Most of the household members of the respondents were below 20 years old, with more than half (59.6%) reported in Zone 1, 54 percent in Zone 2 and 54.1 percent in Zone 3. All KRAs (irrespective of the zones) indicated that most household members belong to that

age range.

Furthermore, the ages provide data on labor force participation rate. The proportion of the household members "in the labor force" appeared to be high, with more than half of the household members reported in the age bracket 15-64 years both in the SMAP level [54.2%] and zonal levels- 52.7% in Zone 1, 54.7% in Zone 2, where more than half of the household members were below 15 years, all the KRAs showed more than half of the household member "in the labor force" has one dependent.

Number of Working Household Members. Zone 3 appeared to have the most working household members (average of 1.82) with Zone 1 the lowest (1.57). KRA-wise, data revealed at least two working household members.

Type of Work. Primarily, the working household members were farmers (SMAP-level [65.2%], zonal levels [80.5% in Zone 1, 78.7% in Zone 2, and 75.1% in Zone 3], or KRA-levels). Zone 3 indicated the most varied occupational categories (10 types) with Zone 1 having the least variations (4 types). A possible explanation for such zonal differences may be in the employment opportunities available in the communities, notwithstanding the geographical locations. Observations show that, compared to the other communities covered in the study, areas in Zone 1 are most inaccessible.

It is interesting to note that KRA 4 of Zone 1 indicated an almost homogenous type of work (i.e. farming and service-related works only) compared to the other KRAs in all three zones.

Farm Related Characteristics. Farm data included tenurial status, classification of land tillers, number of land parcels in possession, number of hectares in possession, number of hectares planted, type of land parcels in possession and farm tools used.

Tenurial Status. Tenurial status refers to the type of relations the respondents have relative to land ownership. In this study, landowners include those who actually owned the land in possession either through purchase, inheritance or usufruct ("right to cultivate the land") for those areas considered as part of the government-reserved land or part of the national park. Tillers refer to the landless respondents who are cultivating land owned by others, while owner-tillers are those owning land and likewise tilling land owned by others.

In this study, data generally show that Zones 1 and 2 respondents were dominated by land owners (66.3% and 46%, respectively), with tillers outweighing other tenurial statuses in Zone 3 (39.9%). While tillers dominated KRA 4 of Zone (62.5%), owners from KRA 1 (60.7%), 2 (80%), and 3 (66.7%) outranked tillers and owner-tillers. In Zone 2, more tillers were indicated in KRA 3 (42.6%), 5 (35.7%), and 7 (50%). While land-owners were mainly reported in KRA 2 of Zone 3, tillers were mostly indicated in KRA 1 (41.4%), 3 (48.8%), and 4(37.8%).

Classification of Land Tillers. Further analysis of those categories as tillers and owner-tillers revealed that most of them were share-tenants, i.e. 34.4 percent in Zone 1, 31.5 percent in Zone 2, and 32.9 percent in Zone 3. Share-tenants were significant in KRAs 1 and 4 of Zone 1, KRA 3 of Zone 1 and KRAs 1 and 4 in Zone 2.

The dominance of share-tenants implies to a larger extent the socio-economic well-being of upland dwellers. Share-tenants appeared to be an easy prey to exploitative pursuits of those needing their services.

Mean Number of Land Parcels in Possession.

Possession is understood as the "control or occupancy of property without regard to ownership". As a whole, the respondents possessed a limited number of land parcels, ranging from one (1) to 2.70. Zone 2 respondents owned slightly larger land parcels (1.67) with Zone 3 the smallest (1.31).

KRA 1 of Zone 2 possessed relatively larger land parcels (1.92) with KRA 2 of Zone 3 having the smallest (1.16). Land owners from KRA 4 of Zone 1, tillers from KRA 2 of Zone 2 and Zone 3, and owner-tillers from KRAs 1, 2, and 4 of Zone 1 revealed the smallest land parcels possessed (1.00) with owner-tillers from KRA 1 of Zone 2 reporting the largest (2.70).

Mean Hectarage in the Possession of the Respondents.

Conversion of land size to hectarage was facilitated by expressing all land sizes reported by the respondents into square meters. Hectarage-conversion was subsequently done by dividing the computed square meters by 10,000. Zone-wise, research findings revealed that Zone 1 respondents possessed on average larger land sizes (5.50 hectares) than those in Zone 2 (2.65) and Zone 3 (2.68).

Data in KRA level showed KRA 3 of Zone 1 (7.23 hectares) having the largest land sizes in possession, with KRA of Zone 3, the lowest (2.43). Cross-classifying hectarage in possessions and tenurial status, owner-tillers from Zone 1 appeared as possessing relatively larger land sizes (5.50) than

those in Zone 2 (2.65) and Zone 3 (2.68). Furthermore, owner-tillers from KRA 3 of Zone 1 (8.68 hectares) revealed much land size, with tillers from KRA 2 of Zone 3 the least (1.5 hectares). Generally, tillers from Zones 2 and 3, compared to Zone 1, appeared to fall short of the stipulations of the Comprehensive Agrarian reform Program (CARP) relative to the requirements of 3 hectares for every Filipino family to be economically viable.

Mean Total of all Hectarage Planted except owner-tillers for Zone 3. Generally, hectarage planted appeared to be low, with all of the respondents from the three zones planting less than 3 hectares. KRA level data also revealed similar trends except for KRA 3 of Zone 3 where respondents, on average, were planting more than three hectares. Zone 3 respondents cultivated an average of 2.46 hectares compared to 2.32 and 1.58 (KRA 4) to 2.24 (KRA 3) hectares compared to Zone 1 (range of 2.06 to 2.73 hectares). Zone 3 KRAs were more varied from as low as 1.79 hectares (KRA 2) to as high as 3.16 in KRA 3.

Each of the owner-tiller from Zone 3 cultivated an average of 3.4 hectares while Zone 2 tillers covered the smallest farm size of 1.33 hectares. Furthermore, when hectarage planted was compared with hectarage occupied, data revealed general ineffective use of land among the respondents. There were more respondents actually cultivating farm sizes smaller than what they possessed. Each owner-tiller of KRA 1 of Zone 3 and KRA 4 of Zone 2 indicated effective use of their land, i.e. cultivating all land in their possession.

Type of Land Parcels in Possession. Land parcels possessed were further classified into monocropping, multicropping, or a combination of both monocropping and

multicropping. Monocropping farms refer to farms planted with a single crop only while multicropping refers to those with varied crops. Generally, the respondents practiced multicropping rather than monocropping (both in the zonal and the KRA-levels).

Type of Farm tools/Equipment Used. The farm tools used by the respondents were categorized into the mechanized and non-mechanized types. The former refers to modern farm equipments such as tractors and sprayers, among others. Non-mechanized farm tools, on the other hand, consist of traditional farm equipments, e.g. bolos and wooden harrows. There was generally limited use of mechanized farm tools among the respondents in the three zones, with the majority using non-mechanized farm tools/equipments. All farmers from Zones 1 and 2, particularly, all reported using non-mechanized farm tools. In Zone 3, six respondents (out of 132) reported using both, particularly in KRAs 1 and 2.

Crop Production. Crop production refers to the specific crops planted by the respondents, the number of hectares planted per crop, the average cropping/harvest per year, and the annual volume of production per crop. The crop production data was established using the 12-month timeframe prior to the survey.

Crops Planted. Corn appeared to be the dominant crop planted by the respondents in all three zones, followed by vegetables and fruit trees. Corn was likewise indicated in all KRAs in Zone 3 as the primary crop planted. Except for KRA 4 in Zone 1, where all of the respondents planted vegetables followed by corn (75%), the rest of the KRAs in Zone 1 planted mostly corn. Farmers in Zone 2, however, were more varied in primary crops planted, with KRAs 2 (100%), and 5 (88.9%)

citing corn and KRAs 1 (83.3%), 4 (98.4), and 7 (100%) engaged in vegetable farming.

Mean Hectarage Planted Per Crop Per Household. When actual hectarage planted was computed per household per crop, average figures appeared to be small. Comparing zones, trees appeared to occupy large tracts of land, particularly in Zones 2 (5 has.) and 3 (26.31 has.), with at least a fourth of an hectare indicated as the smallest planted area, particularly with rootcrops, in Zones 1 (0.29 has) and 2 (0.30 has.). Vegetables were revealed as having the smallest land size planted in Zone 3 (0.25 has). Comparing crops involving relatively large land sizes, KRA data showed KRA 4 of Zone 3 having the largest land size planted with trees (50.50 has.) followed by 5 hectares in KRA 7 of Zone 2 planted with trees/fruit trees. Land planted with spices in KRA 7 of Zone 2 occupied 0.03 hectares.

Average Number of Croppings Per Crop Per Year. Cropping per crop per year showed the frequency with which crops were planted in a year's time. (It is worth mentioning that the respondents had a problem in delineating cropping and harvesting. Thus, cropping is also understood as harvesting by the respondents). Data revealed a varied number of croppings per crop.

Staple foods like rice and corn were planted at least twice a year (both in the zonal and KRA levels). Vegetables appeared to be planted frequently by the respondents within the past 12 months in all three zones, i.e. 16 times in Zone 1, 13 times in Zone 2 and 8 times in Zone 3. Comparing KRAs, frequency of cropping for vegetables appeared high in KRA 2 of Zone 1, KRAs, frequency of cropping for vegetables appeared high in

KRA 2 of Zone 1, KRAs 2,3,4,5, and 7 in Zone 2 and KRAs 2 and 3 in Zone 3. Likewise, spices were frequently planted in KRA 1 of Zone 1 and KRA 4 of Zone 3, rootcrops in KRA 1 of Zone 2 and KRA 2 in Zone 1, and bananas in KRAs 3 and 4 of Zone 1 and KRA of Zone 3.

Annual Volume of Harvest Per Crop Per Household.

The annual volume of harvest per crop per household is expressed in kilos, given the small figures involved. Generally, volume of harvest is greater in spices for Zone 1 and in corn for Zones 2 and 3.

KRA level data revealed that all KRAs in Zone 3 showed corn with the highest volume of harvest for the past 12 months. Spices in KRA 1 of Zone 1, rice, sugarcane, and vegetables in KRAs 1,2, and 5 of Zone 2 were shown with the highest volume of harvest per household crop for the last 12 months.

Crop Disposal. Crop disposal refers to how the respondents utilized their harvest for the past 12 months prior to the survey. In this study, crop disposal is expressed in terms of the proportion of harvest consumed and sold per household per KRA per zone.

Consumption of Farm Produce. Data on the proportion of harvest consumed revealed that some of the crops planted for the past 12 months were generally not sold, e.g. farmer-households planting bamboo in Zone 1 and coconut farmers from both Zones 1 and 2. None of the Zone 3 farmer-households reported consuming all their farm produce. Only farmer-households planting corn and mango in Zone 2 reported consuming more than half of their farm produce. More farmer-groups were observed in the other zones, i.e. farmers who

harvested corn, rice, banana, mango and spices in Zone 1 and those engaged in corn, banana, abaca, legumes and rootcrops in Zone 3. Comparing KRAs in each zone, data in Zone 1 showed that farmer-households planting rice from KRAs 3 and 4, bamboo in KRA 2, coconut in KRAs 1 and 2, and spices on KRA 3 reported consuming all their farm produce. Likewise, only coconut farmers from KRAs 3 and 5 of Zone 2 indicated that they consumed all of their harvest. None of the farmers from KRA levels in Zone 3 indicated entirely consuming any of their farm harvest.

Sale of Farm Produce. None of the respondents in the three zones indicated selling their entire produce for the past 12 months. However, data in KRA level showed that coffee farmers in KRAs 1 and 2, cacao farmers in KRAs 2 and 4, and farmers planting spices in KRA3 in Zone 1 reported selling all their farm produce. Likewise, cacao farmers in KRA 3, those involved in legumes in KRA 4, banana farmers in KRA 5, and coffee farmers in KRA 7 of Zone 2 reported selling their entire produce. The findings seem to imply that entire crops sold were usually those demanding relatively high buying prices such as coffee, cacao, spices, bamboo, legumes, and some vegetables.

Buyers of Farm Produce. Buyers of farm produce of the farmers were mainly the suki (regular buyers), direct consumers (mostly their neighbors) and "any buyer with a relatively high buying price" - in that order - in all three zones. Cooperatives, local store owners, and landowners were similarly mentioned to a limited extent. KRA data likewise revealed the suki as the main buyer of the farmers' farm produce.

Average Buying Price Per Crop. The average buying price is determined on a per kilo basis. Varied average prices were indicated per crop per zone and on KRA levels, with some

of the crops being sold at a relatively high price, e.g. more than P10 a kilo. Such trends suggest the need to look into the viability of massive promotion of these crops as cash-income sources of upland farmers. However, massive promotion of these crops should consider the duration that each crop may yield additional income for cash-strapped uplanders. Crops demanding a relatively high buying price per kilo (i.e. ranging from P 10 and more per kilo) include carrots, tomatoes, black beans, mongo, peanuts, bell pepper (atsal), abaca, cacao, and coffee in Zone 1; tomatoes, sugarcane, black beans, garlic, mongo, peanuts, bell pepper, cacao and coffee in Zone 2; and coffee, abaca, and bell pepper in Zone 3.

Coffee (a perennial crop usually productive in a year's time) and bell pepper (usually productive for three to four months) are the common crops planted in all three zones. Likewise, crops demanding relatively high buying price and common for Zones 2 and 3 include tomatoes, black beans, mongo, peanuts, and cacao. These crops were likewise reported in the KRA levels as demanding relatively high prices per kilo.

Household Income and Expenditures. Household income focuses on the annual income received by each household from varied sources. Expenditures relative to crop production are presented on an annual basis, with regular household expenses presented on a monthly basis. All data are presented on a per household basis.

Research findings revealed at least four income sources of the respondents households such as **on-farm sources**, e.g. sales from farm produce and other farm-related sources such as proceeds received from services in transporting farmers' produce from one place to another, livestock and poultry; **off-farm**

sources, e.g. salaries from employment as teachers, government employees, small entrepreneurs; and income from (credit in this study refers to the cash inflow in the household of the respondents).

Off-farm, income sources appeared to contribute greatly among farmer-households in Zone 1 and 2, followed by on-farm income sources. Zone 3, on the other hand, revealed on-farm sources as their major income-source, with off-farm sources ranking second. Comparing average annual household incomes in KRA levels, the survey results revealed that while the households in KRA-level in Zone 3 indicated on-farm sources as their primary source of income, households in KRAs 1,2, and 3 of Zone 1 reported non-farm sources, while KRA 4 households mainly reported on-farm sources as their primary sources of income. Households in KRAs 2 and 4 in Zone 2 revealed on-farm sources as their primary income source and non-farm income sources were mainly identified by households from KRAs 1,2,5, and 7 as their primary source. Furthermore, the data on average annual household income indicated Zone 2 (P26,114) as earning more than their counterparts in Zone 3 (P22,848) and Zone 1 (P15,453). These figures closely followed the income trends established by SMAP prior to the conduct of this present study, i.e. with Zone 2 (P24,107) earning relatively higher than Zone 3 (P18,938) and Zone 1 (P8,471). The variations between the present income figures and those established by SMAP in 1993 could perhaps be due to the location of sample interviewed. The 1993 SMAP survey covered other samples. The highest and lowest average annual household income were reported in Zone 2, specifically in KRA 1 (P37,661) and KRA 7 (P10,190), respectively.

Their average annual total household incomes were below the national poverty threshold of P66,979.68 annually (or

5,581.64 pesos a month) that a family of six must earn to survive. (Survival Ibon Calendar, 1993:1)

Annual Household Expenditures. Annual household expenditures were categorized into farm-based expenses (e.g. transportation, fertilizer, chemicals, labor, other farm inputs, land rent, livestock and poultry), loan repayment, and household expenses.

Generally, household expenses appeared to have the largest proportion (i.e. 84% in Zone 1, 75% in Zone 2, and 74% in Zone 3) of the total costs incurred by the household annually. The data from Zone 2 indicated the KRAs with both the highest (KRA=795%) and the lowest (KRA 1=70%) proportion of household expenditures relative to the total annual household expenditures.

Analyzing farm-based expenditures, Zonal data revealed variations in their two major expenditures, with households from Zone 1 reporting labor costs (P2,140 per household) and land rentals (P2,117 per household) as their greatest expenditures. Zone 2 indicates fertilizers (P3,030 per household) and labor costs (P2,040 per household as expenditures while Zone 3 reported land rentals (P441 per household) and fertilizers (P3,542 per household) as their two main expenditures.

Data from KRA level, however, were more varied about their top two major farm-based annual expenditures. In Zone 1, households from KRAs 1 and 3 reported land rentals (P2,000 and P2,834, respectively) and labor costs (P1,602 and P2,743, respectively) as their top two major annual expenditures. Those from KRA 2 cited labor (P2,279) and fertilizer (1,567) costs, while KRA 4 households mentioned livestock (P3,467) and fertilizer (P3,213).

Land rentals and fertilizer costs were mentioned by the households from KRAs 1 and 2 of Zone 2 as their major annual expenses (P7,135 and P6,000, and P4,369 and P3,405, respectively). Household from KRA 3 cited labor (P2,298) and livestock (P1,443) costs. Transportation (P4,340) and fertilizer (P3,787) costs were cited for KRA 4; chemicals (P1,600) and other farm inputs (P1,150) for KRA 5; and livestock (1,765) and fertilizers (P500) costs cited for KRA 7.

While households from KRA 3 in Zone 3 revealed land rentals (P3,070) and fertilizer (P2,763) as major costs incurred in an annual basis, those from KRA 1 indicated fertilizer (P3,623) and labor (P2,389) costs; land rentals (P8,334) and labor cost (P3,965) were cited for KRA 2; and fertilizer (P5,857) and land rentals (P5,334) were cited for KRA 4.

Comparing average annual total household expenditures with average annual total household income tends to indicate deficits. Zonal data revealed deficits following closely earlier findings that uplanders' expenditures were greater than their income (Callanta, 1988:61).

Households in Zone 1 (both zonal and KRA levels) indicated expenditures greater than income, households from KRAs 1 and 5 of Zone 2 indicated otherwise. The respondents explained the deficits as due to their poor access to markets. Most of the areas covered by the study were observed to have problems in transporting produce from the farm to the market. Thus, distance to the market and the costs incurred in transporting farm-produce to the market most likely discouraged the respondent-household from selling farm produce, thus forcing them to store them either for consumption or for sale if buyers visit their areas.

Monthly Household Expenses. The household studied appeared to have food as the priority monthly expenditure in all three zones, (i.e. 53% in Zone 1, 49% in Zone 2 and 73% in Zone 3). Second monthly priority expenses, however, varied from each zone, with education as the second priority for monthly expenses for households in Zone 1 and 2, and house rentals for Zone 3 households.

Household monthly expenses per household in KRA level revealed interesting findings. In Zones 1 and 3, while KRAs 1, 2, and 3 revealed food as the top-most priority in monthly expenses, households from KRA 4 of both zones revealed recreation/movies and house rentals, respectively, as theirs.

Mean monthly household expenses were relatively higher in Zone 2 (P1,838) compared to Zones 1 (1,788) and (P1,737). Households from KRA 4 of Zone 2 indicated relatively higher average monthly expenses of P2,555, with those households from KRA 5 of the same zone reporting relatively lower average monthly expenses of 1,047.

Conversion of the average total annual household income and expenditures into monthly figures showed that monthly zonal and KRA data in Zones 1 and 3 indicated that household expenses exceed income.

Although zonal data in Zone 2 revealed expenses exceeding income KRAs 1 and 5 indicated monthly savings.

Summary of Findings

1. Generally, the respondents' households were members of tribal groups.
2. The majority had nuclear families.
3. The respondents have large families with a mean of 5.66 household members, almost equal to the national standard of 6.
4. Male household members (51.4%) outnumbered their female counterparts (48.6%).
5. Literacy rate is significantly high among the household members (73.2%). However, most of the household members have completed primary education (46.6%).
6. Majority of the household members were 10 years old and over.
7. Labor force participation is relatively high, with 54.2 percent ranging from 15 years to 64 years old.
8. They have an average of 1.7 working household members, mainly employed as farmers.
9. Almost all of the respondents claimed "owning" the lands they currently occupied (46.8%), despite the fact that the survey sites are part of the public-lands or part of the national park.

10. Most of the tillers were share-tenants(32.4%).
11. They possessed an average of 3.61 hectares of land, slightly higher than the provision of the CARP to be economically viable.
12. The respondents planted an average of 2.21 hectares, a figure indicating that some parts of the land occupied were not effectively cultivated or reserved for other purposes.
13. Majority of the respondents practiced multicropping.
14. Except for six respondents from Zone 3, the rest of the respondents used non-mechanized farm tools.
15. Corn, vegetables, and coffee were the most popular crops planted on an average of 1.29,0.35 and 0.88 hectares, respectively. On the average, corn was planted 2.07 times in a year' while vegetables were planted 12.08 times as of last year. Average volume of corn production was 5,797 kilos as of last year per household, while average volume of vegetable production was 1,314 kilos per household. Coffee yielded 209 kilos per household as of last year. Spices indicated the highest average volume of production per household as of last year (5,166 kilos).
16. All produce from bamboo and coconut were consumed by the respondents' households.
17. Majority of the harvest of coffee (74%), copra (92%), cacao (74%), spices (71%), and vegetables (73%) were sold by the respondents and usually bought by their regular buyers (92.4%).

18. Crops planted demanding relatively high buying price included carrots, tomatoes, black beans, mongo, peanuts, sugar cane, bell peppers, abaca, cacao, and coffee.
19. Non-farm income sources appeared to be the most significant contributors to household income, followed by sales from farm produce.
20. The respondents earn an annual average income of P19,724 or an average of P1,644 monthly.
21. Household-related expenses constituted the bulk of the respondents' expenses (P28,222 annually or P2,352 monthly). They spent an average of P6,355 for farm-related activities as of last year.
22. On a monthly basis, the largest proportion of the respondent's income was spent on food, i.e. approximately 58 percent.

Recommendations

1. Research findings revealed a strong migrant population in all three zone. This implies diversity and change in resource-use strategies in the uplands. This influx of migrants and the transition to cash economies suggest the limited employment opportunities in the lowlands and the socially and culturally disruptive pressures on resources and damage in the uplands. Considering the varied upland resource-management capabilities of various ethnic groups, it is strongly recommended that environment-friendly and ecologically- balanced programme-activities be designed and implemented.

2. Though registering high literacy rates (73.2%) the introduction of educational programmes and technology development should consider the varied levels of education of the upland dwellers. Most of the household members have only completed primary education (46.6%).
3. Land ownership among the respondents is ambiguous. The survey sites are considered as either public lands or part of the national park. Land tillers are thus regarded as stewards. However, most of the respondents claimed owning the land presently occupied. Such perceptions imply the respondents' preoccupation with ownership and control of productive assets. This suggests a need for a value-reorientation program relative to the upland concept of ownership and control of productive assets such as land. This will not only provide them venues to explore other possibilities of acquiring and controlling productive assets. Income received from upland economic activities may be used to acquire productive assets in the lowlands.
4. Income appeared to be low relative to their expenses and national poverty threshold of P5,585.64 that a family of six must earn to survive. Likewise income was generally derived from farm-based production and payment from services rendered. A material-resources inventory is thus recommended to look into the skills possessed by the community residents for possible matching and identification of income-generating projects indigenous to the communities served. This will not only provide and enhance skills-development among the uplanders, but will also provide additional cash-incomes and job opportunities for unemployed household members who are in the labor force.

5. Considering that SMAP covers the watersheds in Southern Mindanao, a study is likewise recommended focusing on the upland resource management activities of the migrants vis-a-vis tribal communities. An underlying objective is the identification of appropriate upland technology development so as to promote the protection and enhancement of the ecosystems.