FERTILITY AND THE SOCIAL STRUCTURE

OF GUAM

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The sociologist, Louis Wirth has stated that Urbanism is a way of life.[1] Cities are not new in Asia. Infact, Asia might have been the birth place of urban centers. Sjoberg has reminded us of the existence of the pre-industrial city.[2] When we speak of the impact of urbanization then, I would prefer for our purposes, to view it as the impact of that set of lifestyles which has come to be known by the various umbrella-like terminologies, such as modernization or development understood in the broadest possible context, and not necessarily restricted to the development of the physical city per se.

My paper concerns fertility and its reciprocal relationship to the social structure of Guam. The starting point of our analysis can be the basic fact that the reported crude birth rate of Guam is 34 per thousand and the crude death rate is approximately 4 per thousand.[3] This means that Guam in effect is in a stage of demograph disequilibrium resulting from a twentieth century mortality pattern coexisting with a 19th century fertility pattern.

Though we might like to think of ourselves as unique, Guam shares this paradox of deathcontrol preceding fertility reduction with most of the world's developing areas. One consequenc

of this is that the great demographic differentiator in the more developed- less developed dichotomy is no longer mortality, but fertility. The more developed world tends to have low mortality and low fertility, while todays less developed world tends to have low mortality and high fertility.

We will call on two models to explore these relationships, namely, the model of the Demographic Transition, and the Social Area or Factorial Ecological model. These two models deal with the impact of modernization on the social system and so are quite appropriate for the theme of this symposium. The Demographic Transition model is a bivariate model. It provides a picture of the interaction of two major demographic variables, fertility and mortality, under the impact of the modernization transformation. In contrast, the Social Area model is a multivariate one , and provides insights into the relationships of demographic variables and a host of other areally distributed, social and economic traits.

GUAM'S DEMOGRAPHIC TRANSITION

The Transition model[4] hypothesizes a transition from an equilibrium stage of high mortality and high fertility resulting in low growth, through an intermediate explosive stage triggered by dramatic declines in mortality accompanied by only moderate or slight changes in fertility, and finally, to a third stage where fertility and mortality are both low , resulting in a new equilibrium of low growth. Guam's transition fits the classic model quite well. In the early 1900s Guam had a high birth rate

hovering around 50 per thousand and death rates around 30 per thousand. Pre-war Guam had reported birth rates of about 40 to 35 per thousand death rates of 20 to 15 per thousand. For the first 40 years of the 20th century Guam experienced an average rate of 2% and remained in the initial transition of very high birth rates and a falling death rate.

The post-war period saw an acceleration of the death rate decline. Death rates fell to 10 and then to 4 per thousand in the late sixties and early seventies. During this period the birth rates dropped to the low thirties after a brief postwar rise in current fertility despite some decline in fertility, The greater relative drop in mortality meant that postwar Guam averaged a natural increase of 30 per thousand, which was higher than the 20 per thousand natural increase of the pre-war period. Since 1960 Guam has been an average growth of 3% per year, which means a doubling of the population in 23 years if it should continue. Even if zero growth rates should take place now, the aftermaths of the past population experience will continue to have significant impact on the economic prospects of Guam as the cohorts from the high birth rates of the fifties and early sixties continue to enter into the labor force market.

The really intriguing question is how long will this demographic imbalance of death control in the midst of high fertility last? The Demographic transitionmodel says that fertility will come down. It does not say when. A comparison of the trends in the urbanized peripheral islands states of Asia, reveals that for the first time Asian societies other than Japan, have cracked the the Transition barrier, and are well on the way to a low fertility and low mortality pattern.[5] Examination of the Age Specific fertility rates (table) for Guam, Hong Kong and Singapore, reveals that though these states have lower age-specific fertility rates than Guam at all age levels except the 45-49 age category, the significant difference lies in the large number of births to women in the 20-24 and 15-19 age groups in Guam. Guam has birth rates for women 15-19 is about three times that of Hong Kong or Singapore, and the birth rate for women 20-24 is about twice as high.

The optimistic note is that since it is the younger age group which is most likely to be receptive to the modernization transformation, the prospects of an accelerated fertility decline for Guam within the next five or ten years is quite likely.[6]

FERTILITY AND THE FACTORIAL STRUCTURE OF GUAM.

The data base for this multivariate analysis consists of sixty census variables analyzed at the ordinal level of association. The data reduction process included a 60x60 intercorrelation matrix, cluster analysis, and a Varimax rotated Factor analysis. Only the summary findings of the factor analysis are included in this report. Analogs of this research design would be the the early Social Area analysis efforts of the ecologically-oriented sociologists such as Shevsky,[7] Bell,[8] Schmid,[9] Greer[10], and the recent Factorial Ecological analysis of sociologists and regional scientists such as Sweetser[11], Abu-Loghod[12], and Brian Berry.[13]

The contribution of this study is that fertility indicators are explicitly analyzed in terms of demographic theories and also in terms of the older social area constructs. Multivariate econometricians like Irma Adelman[14] have not utilized social area constructs in their conceptual frame of reference, nor have the more recent works of followers of this econometric approach. For example, a recent study by Chai Bin Park on " multivariate analysis of Areal fertility in Honolulu,[15] did not indicate, either by the labelling of the factors nor the references, that factorial ecological constructs were a relevant model for the interpretation of his factors.

Although the Familism dimension has a measure of fertility as one of its highest identifying loadings, the early social area pioneers were not primarily concerned with ~~the~~ demographic analysis per se. Another contributing factor is that social area analysts until very recently restricted their constructs to the intra-city ~~level of aggregation~~ variation and remained blind for more than two decades to its possible generality at other levels of areal aggregation. The later social geographers and regional scientists, when they rediscovered this most spatial of all ~~of~~ the of all social models, at first repeated ~~this~~ error of treating it ~~as~~ exclusively as an intra-urban model. Their contribution was to validate the generality of the social area constructs at the intra-urban scale by their empirical analyses done in a variety of metropolitan centers throughout the world, ~~but~~ The lag in applying testing social area constructs at scales other than the intra-urban level is even more astounding when one considers that the developers of the social area constructs Shevsky and Bell,[16] carefully pointed out in their ~~original~~ pioneering study that the provenance of the theory related to total societal change, and treated urbanization as sympotomatic of, and a convenient mirror model of ~~that~~ change in the broader society. They cited the anthropologists Wilson and Wilson[17] who argued that an increase in scale accompanied modernization. One's life styles and values were no longer corralled within the family or tribal circle exclusively, but developed along different avenues depending on occupation, education, and family life styles.

More recently scholars beginning with Abu-Lughod[15] ~~in her~~ Cairo study,[16] Brian Berry[19] in his Calcutta study, D.W.G Timms[20] comparative study of Cook Island , Brisbane and Auckland, and R.J. Johnston[21] in his Urban Residential Patterns, have explored the factorial groupings that result in urban centers from societies in different stages of modernisation, and hypothesized that the seaaration of Familism from Social rank factors is a characteristic of the developed western urbanized societies. In places like Cairo and Cook Island, in the early initial stages of modernization, there is no observed separation between social rank and familism. In other words, occupation, education, income are not yet independent of family styles. Still lacking is a comparative systematic empirical test of the hypothesis for societies at different stages in the modernization transformation and a theoretical formulation of the relationships.

An investigation of fertility and the changing social structure of Guam provides an opportunity for the coupling of two models explicitly concerned with the impact of the modernization transformation on societies.

In Guam, not only was stage in life cycle or familism separated from socio-economic status factors, but in a clear departure from previous soical area models, occupation, education, and income variables have not coalesced into a socio-economic status factor, but have drawn apart into an autonomous independence. On the surface, we seem to have gone one better than the developed nations. If separation of socio-economic status and familism factors is symptomatic of the modernization

transformation, than what is the ~~complexity~~ seemingly centrifugal tendencies of the subsets of the normative socio-economic status factor indicative of? Is this over modernization? Are we the first of the post-developed societies? Has Guam bypassed the industrial revolution, discarded her agricultural tradition, and entered into a post-industrial world where Tertiary functions dominate?

If the nonseparation of social rank and familism is a hallmark of premodern societies, while the separation or disassociation of social rank is a hallmark of the modern society, then the issue is relevant as to whether the superfragmented clustering ~~in~~ of Guam's factorial structure, is the the forerunner of the post-modern tertiary based society, or whether it is the consequence of the disruptive fragmentation as a result of the jolting impact of rapid, dramatic and sudden social change, and massive intrusions in a marked insular context.

The summary interpretation of the factors constitute the best of the paper (still in handwritten form). I am giving you this fragment so that you will have something more than the abstract in your hands today.

	-MEDIANAGE	% LESS THAN HIGH SCH, 25	MED. SCH YRS ITEM 25 YRS	MED SCH YRS MALES 25 YRS	% PERS 18 TO 24 WITH 4 YRS H	% PER 25 YRS WITH 4 YRS HS	% LESS THAN 5 YRS ELEM, AGE 25	# CHILDREN EVER BORN TO WOM 15 TO 24 YRS	# CHILDREN EVER BORN TO WOM 25 TO 34 YRS	# CHILDREN EVER BORN TO WOM 35 TO 44 YRS	# CHILDREN EVER BORN TO WOM 15 TO 24 YRS	% EVER MARR WOM 15 TO 24	% EVER MARR WOM 25 TO 34	% EVER MARR WOM 35 TO 44
1 AGAÑA	4	12.5	5	7.5	5.5	4	13.5	16	18	18	17	1	18	19
2 AGAÑA HTS	6	16.5	8	3	8.5	2	16.5	14	16	11	16	6	12	17
3 AGAT	9.5	7	13	13	16	6	6	13	9	2	11	13	17	10
4 ASAN	8	14	6	6	10	3	12	12	17	12	14	11	6	3
5 BARRIGADA	11	10	10	10	12	5	11	7	13	7	7	7	13	11
6 CHALAN P. ORD.	18	5.5	14	16	17	7	7	5	5	6	10	12	11	13
7 DEDEDO	15	18	3	3	3	1	18	8	11	17	8.5	5	5	4
8 INARAJAN	19	19	1	1	1	12.5	19	10	2	1	5	15	14	18
9 MANGILAO	7	3	18	17	18	17	2	9	10	5	12	4	8	6
10 MERIZO	17	12.5	4	7.5	5.5	10	13.5	1	1	4	1	8	3	14
11 MONGMONG T-M.	3	16.5	8	3	8.5	11	16.5	17	8	14	19	9	4	7
12 PITI	13	8	12	13	14	12.5	5	6	4	3	8.5	16	9	5
13 SANTA RITA	5	4	17	15	15	16	8	2.5	14.5	16	4	2	2	2
14 SINAJANA	12	9	11	11	11	14	10	15	3	15	15	18	15	16
15 TALOFOFO	15	15	2	5	2	9	15	11	6	9	13	17	16	12
16 TAMUNING	2	1	19	19	13	19	3	18	14.5	13	18	10	10	8
17 UMATAC	14	5.5	16	13	4	18	4	4	7	8	3	19	7	9
18 YIGO	1	2	15	18	19	15	1	2.5	19	19	6	3	1	1
19 YONA	16	11	8	9	7	8	9	10	12	10	2	14	19	15

	# CHILDREN EVER BORN (25 to 34)	# CHILDREN EVER BORN (35 to 44)	# PERS PER HOUSEHOLD	% FEMALE IN LAB FORCE	MEDIAN INCOME	INDEX OF INCOME CONCENTRATION	% POP IN CITIES	TOTAL POP 1970	POP. DENS. 1970	PER CAP INCOME	BIRTH RATE		DEATH RATE	Median Years Education	SEX RATIO	% FEM 14+ SINGL	% 65 YRS OVER
	19	17	19	1	7	7	9	14	4	1	1		5	1	4	15	3
	14	14	15	5	3	16.5	16	10	2	4	10		13	3	7	13	11
	9	8	8	11	9	14	8	7	10	11	2		3.5	12	8	9	9
	17	12	12	7	5	10	18	12	9	8	16		16	5	13	16	14
	15	10	10	9	13	18	10	5	6	12	13.5		10	7	16	12	13
	4	7	6	12	14	12.5	5	11	7	15	13.5		3.5	15	14	11	12
	13	15	11	6	4	16.5	1	2	11	7	12		15	4	6	17	16
	3	3	2	16	19	1	13	16	19	19	11		7	17	17	7	5
	10	11	14	4	8	8	4	9	13	9	9		12	8	9	1.5	8
	1	5	5	15	18	2	14	17	14	17	3		2	16	12	10	6
	12	13	13	3	2	15	2	6	3	3	17		17	6	1	8	17
	6	4	9	18	15	5	11	18	15	13	4		1	9	10	6	1
	18	18	18	13	12	4	19	4	8	5	18		18	14	3	14	18
	5	9	7	10	6	6	17	8	1	10	5		10	13	18	5	2
	7	2	4	8	10	12.5	7	15	18	14	6		6	10	11	4	4
	16	16	17	2	1	11	3	3	5	2	15		14	2	5	18	15
	2	6	1	19	17	3	15	19	16	18	7		8	19	19	1.5	10
	11	19	16	17	11	19	6	1	12	6	19		19	18	2	19	19
	8	1	3	14	16	9	12	13	17	16	8		10	11	15	3	7

3

	% UNDER 18	% PROFESSIONALS & KINDRED	% LABORERS EXCEPT FARM	% SALES WORKERS	% CLERICAL & KINDRED	% SERVICE WORKERS EXCEPT PRIVATE HOUSEHOLD	% CONSTRUCTION	% AFC	% Born in PHILIPPINES	% CRAFTSMEN & KINDRED	Tot unempl % Civ Lab F	Fem unemp % Civ Lab F	Male unempl % Civ Lab Force	Test Ratio I	5-14 / 20-44	Wm 20-24 / 15-44	Gen Fert Rat # BIRTHS / 15-44
	31	32	33	34	35	36	37	38	39	40	41	42	43	42 TIMES	43 THU	44	45
AGANA	18	10	19	4	16	4	3	9	2	3	1	14	15.5	19	19	1	1
AGANA HTS	14	3	17	6	7	12	13	13	11	16	16	12.5	17	14	17	4	11
AGAT	8	9	7	9	4	15	16	7	5	11	11	11	10.5	7	9	17	3
ASAN	11	11	11	1	3	9	15	11	9	17	18	18	19	15	15	13	17
BA[illegible]IGADA	10	13	12	5	9	7	5	18	8	8	17	12.5	4	10	11	2	14
CHALAN PAGO	2	14	10	13	6	10	9	16	14	7	2	1	1	2	2	14	12
DEDEDO	13	2	16	2	8	8	8	15	3	13	8	3	10.5	12	14	6	13
INARAJAN	3	5	6	19	10	1	11	17	18	19	6.5	4	15.5	4	1	8	9
MANGILAO	12	1	9	14	12	14	6	14	10	12	9	6.5	15.5	11	12	3	10
MERIZO	1	7	5	18	15	6	18	3	17	14	10	16	7	1	5	15	2
MONGMONG-T.M	19	12	2	12	14	19	1	6	6	4	15	15	18	16	13	5	15
PITI	7	16	15	3	2	18	14	4	12	9	13	17	8.5	3	7	9	4
SANTA RITA	17	6	8	8	5	16	10	1	7	5	6.5	2	8.5	13	16	7	18
SINAJANA	9	17	13	7	1	13	12	5	13	6	14	19	14	9	6	10	6
TALOFOFO	4.5	8	1	16	9	5	7	10	15	15	4	6.5	5.5	6	3	11	5
TAMUNING	15	4	18	10	18	17	2	12	1	2	12	10	12.5	17	18	12	16
UMATAC	4.5	19	3	17	13	2	19	2	19	10	3	8.5	2	8	8	18	8
YIGO	16	18	14	15	17	11	4	19	4	1	17	5	12.5	18	10	19	19
YONA	6	15	4	11	11	3	17	8	16	18	5	8.5	3	5	4	16	7

4

	% Acres 2-15% slope	Slope 35%+	Slope 16-35%	% of Acr. in Agric. Conserv.	% Total Ag. in Agr. Use	% Total Ac. in Urban Use	% Owner Occup	% Hus. Rental	% New Housing 1960-70	Houses Built 1940-49	% with Hot & Cold Water Piped In	% with Flush Toilet	% Lacking Some or All Plumbing	% Bathtub or Shower None	% Phys. Cond. of Struct. "Bad"	1970 Pop / 1960 Pop
	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	
EANA	3.5	16.5	17	9	17	4	19	1	12	11	4	2	18	9	19	9
CANHIS	17	6	1	16	7	3	14	5	18	3	3	3	17	18	11	16
LGT	15	4	6	12	5	12	11.5	7.5	11	8	15	12	8	11	7	8
BAN	11	7	10.5	8	8	10	11.5	7.5	17	9	8	6	14	12	9	15
ARRI	2	19	15	18	2	8	9	10	15	4	10	9	9	~~15~~ 8	16	10
HALAN	12.5	9	7	6	18.5	6	4	16	8.5	17	13	13	5	5	10	5
EDED	2.5	16.5	17	13	4	11	13	6	1	19	1	5	15	14	18	1
ACAN	10	10.5	5	1.5	18.5	18	2	18	13.5	5	18	18	3	4	3	13
ANEIL	5	14.5	17	10	9	7	15	4	3	7	6	11	13	13	13	4
EKIZO	14	2.5	9	4	14	9	3	17	7	12	17	17	2	2	4	14
IONENG	6	14.5	13	15	10	2	17	2	5	15	5	4	16	17	8	2
ITI	18	2.5	2	11	6	15	16	3	8.5	13	11	10	10	9	6	18
ANIKHTA	9	10.5	12	17	1	13	8	11	13.5	10	14	15	6	7	2	19
INABANA	7.5	13	10.5	7	12	5	7	12.5	19	1	7	7	11	6	5	17
HODOFO	12.5	8	8	5	11	14	6	12.5	4	18	12	14	7	3	15	7
HIUNDNE	1	18	19	19	13	1	18	14	6	14	2	1	19	15	17	3
HATAC	19	1	4	1.5	16	19	1	19	10	2	19	19	1	1	1	11
IEO	7.5	12	14	14	3	16	10	9	2	16	9	8	12	16	12	6
IONA	16	5	3	3	15	17	5	15	16	6	16	16	4	10	14	12

Abstract

MODERNIZATION, FERTILITY, AND THE FACTORIAL SOCIAL ECOLOGY OF GUAM, 1970: Some preliminary findings

From an input data matrix of 60 socio-economic variables for the 19 Districts of Guam a set of factorial ecological clusters are obtained. Several direct and indirect measures of fertility are then analyzed in terms of their actual and theoretically expected relationship to the underlying dimensions of the socio-ecological system.

Major ~~findings~~ include the
1. ~~The set of v~~ Social Rank ~~variables~~ dimension does not correlate with Familism as has been hypothesized for traditional societies ~~in the~~.
2. For Guam Income ~~to~~ Education ~~& Econ~~ Occupation variab[les] separate into ~~clear~~ distinct factor dimensions ~~clusters~~ rather than merging into the well-known Socio-Economic Sta[tus] dimension ~~factor~~ ~~as~~ common to Social Area Analyses ~~in A~~ done on Modern societies.

(inserted between lines:) Social Area constructs are well dev. for modern societies — Lughod & DWE Timms. Conceptualization [for] trad. societies, Transitional rapidly changing has been ignored.

~~Further~~ When the Fertility indicators are disaggregated for different age groups of women ~~women~~ they tend to load ~~diff~~ on different factor dimensions rather than exclusively on the Familism Factor. This is logical since the life-styles of women in the child bearing ages ~~are different and~~ vary with age ~~&~~ one may then expect different socio-ecological factors to ~~to have be~~ emerge as ~~causal~~ correlates of fertility.

(Margin note:) Could Guam be a case of superheated "scale" concentrated [illegible] of incipient [illegible] with been done [illegible] the impact effect.

Abstract.

FERTILITY AND THE FACTORIAL SOCIAL ECOLOGY OF GUAM, 1970.

From an input data matrix of 60 socio-economic variables for the 19 Census Districts from the Guam 1970 census a set of factorial ecological clusters are obtained. Their relationship to several direct & indirect measures of fertility are then analyzed in terms of their relationship to other demographic variables and then in terms of their actual & expected relationship to the broad spatial organization of the ecological system & sub-system.

HARRY SICKLER 1970 1980
Projections for

ASAN	2629	3929
PITI	1284	1947
AGANA HTS	3156	4781
SINAJANA	3506	5311
CHALANPAGO	2931	4441
JONA	2599	3939
MANEILAO	3228	4886
TAMUNING	10218	15480
DEDEDO	10780	16328
BARRIGADA	6356	9588

P33 Guam Pacific Growth leaders

		Incr	%
1970	84996	17952	26.8
1960	67044	7546	12.7
1950	59,496	37,206	166.9
1940	22,290	3781	20.4
1930	18,509	5234	39.4
1920	13 275	1469	12.4
1910	11 806	2130	22.0
1901	9676	...	...

1980 Projects GV. 106,194
MI 22,564

POST-CENSAL ESTIMATION OF 19 ELECTION DISTRICTS BY SIMPLE STEP-RATIO METHOD

	1970	1975	Simple Step ratio estimate 1980	Simple Step ratio 1985
AGANA	2119	2665	3210	3940
AGANA HTS	3156	3969	4781	5867
AGAT	4308	5416	6523	8004
ASAN	2629	3279	3929	4887
BARRIGADA	6356	7972	9588	11816
CHALAN PAGO	2931	3686	4441	5450
DEDED	10780	13554	16328	20037
INARAJAN	1897	~~2443~~ 2386	2875	3527
MANGILAO	3228	~~4123~~ 2443	4886	5996
MERIZO	1529	~~7617~~ 1923	2317	2844
MONGMONG TM	6057	~~1616~~ 7417	9176	11260
PITI	1284	~~10196~~ 1616	1947	2389
SANTA RITA	8109	10196	12282	15072
SINAJANA	3506	4409	5311	6517
TALOFOFO	1935	2434	2932	3598
TAMUNING	10218	12849	15480	18996
UMATAC	813	1023	1233	1512
YIGO	11542	14510	17478	21448
YONA	2593	3269	3939	4834
	(a) 84996	(b) 105216	128656 (c), (e)1	157994 (d), (e)2

a) 1970 Census
b) Simple arith interpolation
(c) Step ratio estimate
(d) Step ratio estimate.
(e) Dept of Commerce estimate.
(e) Base Population for ~~E~~ E2, from MEDIUM ESTIMATE OF THE GUAM MASTER PLAN.

mil.	19,000	
military	30,000 est	
military	22 000 est.	
military	22,00 est.	

Note This is a quick crude estimate of subdivisions.

Prof. Roy Chung

	1970	1960	% CHANGE	Rank 1970	Rank 1960	1970 % Share of Total a	1960 % Share of Total	a×b	b = 1970 Share / 1960 Share	91405. 1980 esti. ~~ratio meth.~~ = ~~110141.3438~~	29.58% 1970 Share applied to Dept Comm 1980 proj'n 128,758
GUAM	84996	67044	26.8								32060742 ~~32065710~~
AGANA	2119	1642	29.0	14	15	.0249	.0245	.253	1.0163	2193.5397	
AGANA HTS	3156	3210	-1.7	10	7	.0371	.0479	.287	.7745	2444.3220	4776.9218
AGAT	4308	3107	38.7	7	8	.0507	.0463	.0555	1.0950	47172.2600	.6528.0306
ASAN	2629	3053	-13.9	12	9	.0309	.0455	.0265	[illegible]	2253.3159	3978.6222
BARRIG	6356	5430	17.1	5	4	.0748	.0810	.0691	.9235	~~5723.5905~~ 5869.7660	9631.0984
CHALAN	2931	1835	59.7	11	13	.0345	.0274	.0434	1.2591	3690.4221	4442.1510
DEDEDO	10780	5126	110.3	2	5	.1268	.0765	.2102	1.6575	17867.7850	16326.5144
INARAJAN	1897	1730	9.7	16	14	.0223	.0258	.0193	.8643	1639.5771	2871.3034
MANGILAO	3228	1965	64.3	9	12	.0380	.0293	.0493	1.2969	4186.3932	4892.8040
MERIZO	1529	1398	9.4	17	16	.0180	.0209	.0155	.8612	1316.7748	2317.6440
MONGMONG	6057	3015	100.9	6	10	.0713	.0450	.1130	1.5844	9596.7108	9180.4454
PITI	1284	1467	12.5	18	17	.0151	.0219	.0104	.6895	885.3180	1944.248
SANTA RITA	8109	12126	-33.1	4	1	.0954	.1809	.0503	.5274	4276.6866	12283.5132
SINAJANA	3506	3862	-9.2	8	6	.0412	.0576	.0293	.7116	2494.8696	5304.8296
TALOFOFO	1935	1352	43.1	15	18	.0228	.0202	.0257	1.1287	2184.0345	2935.6824
TAMUNING	10218	5944	71.9	3	3	.1202	.0887	.1629	1.3551	13846.4118	15476.7116
UMATAC	813	744	9.3	19	19	.0096	.0111	.0084	.8727	709.5051	1236.0768
YIGO	11542	7682	50.2	1	2	.1358	.1142	.1615	1.1891	13724.5922 ~~13769.8432~~	17485.3364
YONA	2599	2356	10.3	13	11	.0306	.0351	.0267	.8718	2265.8082	3939.9948
								25143		~~110141.3438~~	~~110327.9246~~

125428.6700

33.1
Santa Rita
9.2
Sinajana
13.9
Asa.
1.7
Agana Hts
% Chage
9.3
Umatac
9.4
Merizo
9.7
Inarajan
10.3
Yona
12.5
Piti
29
Agana
43
Talofofo
Hagatna Hts
17.1
Barrigada
38.7
Agat
50.2
Yigi
59.7
Chalan P
50.2
Mangilo
71.9
Tamuning
107.9
Mongmong
110.3
Dededo
Agana Hts
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
TOTPOP 22

To: The subsd POPSIZE + POP CHANGE GROUPINGS

	84996 1970	67044 1960	1970 % share of subtotal	1980 ~~1960~~ % share subtotal
BARRIGADA	6356	5930	.1147	9588.~~2730~~
AGAT	4308	3107	.0777	6523.~~9318~~
TAMUNING	10218	5344	.1844	15480.~~7138~~
DEDEDO	10780	5126	.1945	16328.~~3170~~
MONGMONG	6057	3015	.1093	9176.~~7556~~
MANGILAO	3228	1965	.0582	4886.~~9026~~
CHALAN PAGO	2931	1835	.0529	4441.~~9664~~
YIGO	11542	7682	.2082	17478.~~4350~~
Subtotal	55418		.6520	83950.2160 83900 83900.
TALOFOFO	1735	1352	.1589	2932.~~8673~~
AGANA	2119	1642	.1740	3210.~~4777~~
YONA	2599	2356	.2135	3939.~~2931~~
INARAJAN	1897	1730	.1558	2875.~~6691~~
MERIZO	1529	1398	.1256	2317.~~4483~~
UMATAC	813	744	.0668	1232.~~5282~~
PITI	1284	1467	.1055	1947.~~5828~~
Subtotal	12176		.1433	18451.0214 18453
SANTA RITA	5109	12126	.4660	12282.~~2514~~
SINAJANA	3506	3862	.2015	5310.~~8877~~
AGANA HTS	3156	3210	.1814	4781.~~1167~~
ASAN	2629	3053	.1511	3928.5068
Subtotal	17400		.2047	26356.7626 26303

For 1985
103016

1985
22641

1985
32343

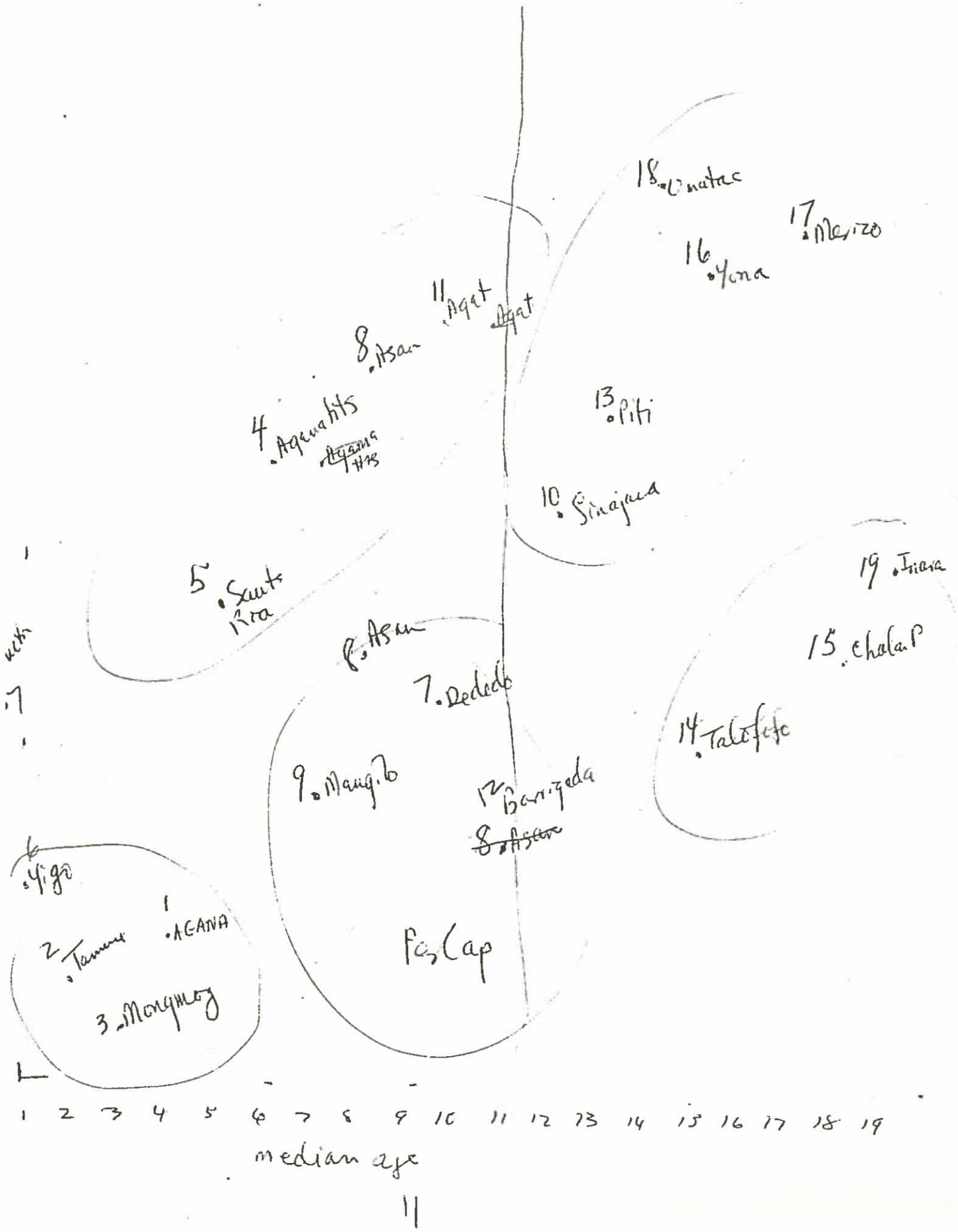
15800

9

128758

128656

1 Sum each.
2


18. Cnatac
17. Maize
16. Yuca
11. Agat
Agat
8. Asan
4. Aguacates
Aguacate
13. Piti
10. Sinajana
5. Santa Rita
19. Inarajan
8. Asan
15. Chalan
7. Dededo
14. Talofofo
9. Mangilao
12. Barrigada
8. Asan
6. Yigo
1. AGANA
2. Tamuning
3. Mongmong
Fa, Cap
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
median age
11

RIEGIONS?		%	1970	1960 1960

Med Sch ~~yrs~~ yrs
~~%~~ % under 18.
Percap Inc.
Male educa.
Female lab force

% Share
% Subtotal
1970

		% Change	1970 84996	1960 67044
TAMUNING	TAMUNING }	71.9	10218	5944
~~YIGO~~	MANGILAO }	64.3	3228	1965
MANGILAO	YIGO }	50.2	11542	7682
~~SANTA RITA~~	SANTA RITA }	-33.1	8109	12126
BARR } % Share % Total		17.1	6356	5430
SINAJANA		-9.2	3506	3862
AGAT		38.7	4308	3107
PITI		12.5	1284	1467
CHALANP		59.7	2931	1835
UMATAC }		9.3	813	744
YONA		10.3	2599	2556
MERIZO		9.4	1529	1398
INARAJAN		9.7	1897	1730
?? TALOFOFO		43.1	1935	1352
MONGMONG }		100.9	6057	3015
~~AGANA HTS~~		-1.7	3156	3210
DEDEDO		110.3	10780	5126
ASAN		-13.9	2629	3053
~~TALOFOFO~~				
~~A~~ AGANA }		29.0	2119	1642

	1960	1970	1975 by Interpolation	1980 Step Ratio method	1985
AGANA	19	2119	2665 ~~9588~~	3210	3940
AGANA HTS		3156	3969 ~~6523~~	4781	5867
AGAT		4308	5416 ~~15480~~	6523	8006 ~~12776~~
ASAN		2629	3279 ~~15429~~	3929	4887
BARRIGADA		6356	7972	9588	11816 ~~18123~~
CHALAN		2931	3686	4441	5450
DEDEDO		10780	13554	16328	20037 ~~30731~~
INARAJAN		1897	2386	2875	3527
MANGILAO		3228	2443	4886	5996
MERIZO		1529	1923	2317	2844
MONGMONG		6057	7617	9176	11260 ~~17269~~
PITI		1284	1616	1947	2389
SANTA RITA		8109	10196	12282	15072
SINAJANA		3506	4409	5311	6517
TAFOFO		1935	2434	2932	3598
TAMUNING		10218	12849	15480	18996 ~~29435~~
UMATAC		813	1023	1233	1512
YIGO		11542	14510	17478	21448
YONA		2599	3269	3939	4834
		84996	105216	128656	~~158,000~~ 157994
			30,000	22000 mil	~~159,000~~ 22,000

Using Medium estimate of Master Plan.
as Base Total.
Military av. 22,000

	1970	1975	1980	1985	1990
Low	64510	76089	89938	105706	123157
Med	67890	84317	104956	128982	157352
Hig	67890	87562	112597	144597	180,089

96123.1236
1811 9.1236

26.8
34.2

65

6.5
39
65
104

	1960	1970	
Civilian	40,954	65,959	+61%
Mil	26,090	19,037	-34%
	67,044	84,996	

1980

Dept Com Proj	Civ.	106,194
	Mil	22,564
		128,758

Military estimated by averaging 1960–1970.
The 1980 fig was a simple percentage extrapolation apparently

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If say mil decl. 1/3

	106,194
+	15,564
	112,758

Master Plan Projection	1970	1975	1980	1985	1990
Low Census, low b, zero migr.	64510	76089	89,938	105,706	123,157
Hi census, med b, med migra	67890	84317	104956	128982	157352
		20 000 / 94317	22 / 126	22 / 150982	
Hi census hi birth hi migra	67890	87562	112597	144597	180089

128.982

22	22	15	15	
86,317	126,	143,	162,352	