Philippine Journal of Public Administration, Vol. XXXIII, No. 1 (January 1989)

Palay, Policy and Public Administration: The "Masagana 99" Program Revisited

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During the period 1973 to 1977, the management of "Masagana 99" -- the national rice production program of the Marcos Administration -- under the direction of Agriculture Secretary (later Minister) Arturo Tanco Jr. was significantly different from the management of any previous Philippine agricultural program. The problems of program management were consciously addressed by Tanco in Masagana to a degree never before undertaken. A rationally-structured control-type Management Information System (MIS) was one of the principal administrative management techniques employed by the then Secretary which contributed to the success of the early Masagana program. Using the data amassed by that Management Information System, together with information from other sources, the Masagana program was reviewed to reevaluate both its achievements, and the appropriateness of its primary policy assumptions. From this review, several startling conclusions were reached which have major implications for both the design and the administration of future agricultural production programs.

Introduction

"Masagana" Background

In July 1972, just after the main rice crop had been transplanted in the paddies, Central Luzon -- the "Rice-bowl" production area which primarily serves the needs of Metropolitan Manila -- was inundated by one of the worst floods in the country's history. A typhoon moved in over the island and stayed, bringing continuous torrential rains for an apocalyptic forty days and nights. The flood waters rose to unprecedented levels, bursting the main flood dikes of the Central Luzon watershed and silting the river mouths, overflowing some 200,000 hectares of riceland and destroying the rice in the fields.

After the rains stopped, the accumulated flood waters took a further two weeks to subside and run off in most areas. The devastation revealed by the receding water was enormous. Roads, bridges and buildings were damaged and/or destroyed; some rivers changed their courses through former rice paddies, while many rice fields were buried up to several feet in silt, rendering

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them untillable. This drastically affected the livelihood of some 100,000 small farm families -- most of whom lost their work animals, farm implements, investments in agricultural supplies such as seed and fertilizer, and many, even their homes. At the same time, the other major rice growing areas in the Central and Southern Philippines were experiencing a drought which withered the rice seedlings in their beds, compounding the nation's rice production problems.

The Department of Agriculture and the National Food and Agriculture Council (NFAC) organized and launched a recovery program -- "Operation Rice Bowl" -- in an effort to avert disaster. Then, in mid-August, new storms brought more rainfall and renewed flooding. Almost all of the farmers who had managed to replant after the initial flood now had their new seedbeds washed away by the second flood. A second phase of "Rice Bowl" -- "Operation Palagad" -- was launched in October as a more comprehensive assistance program for the traditional palagad (i.e. "dry season") rice crop which began plantings at that time, supplemented by a free fertilizer distribution program[1] so that those farmers who were able to replant would not have their yields curtailed for lack of nutrients. Unfortunately, this intensive effort was to no avail in so far as increased rice production was concerned. Just as the rainy season had had abnormal typhoon weather, the palagad brought major drought conditions throughout the country, drastically curtailing any prospect for the newly planted crop. Rice was planted in what were normally river beds -- in effect a "last ditch stand" -- and even these crops withered for lack of moisture.

By February 1973, the resulting shortage of rice in the Philippines had reached critical proportions. The nation's stocks were being drawn down without replenishment and, coupled with a world-wide shortage, the Philippines was unable to import rice to make up the deficit -- as had been possible in previous years where production shortfalls had occurred.

> Six countries in Asia alone suffered shortages totalling about 8.6 million tons of grain. Russia was forced to import approximately 26 million tons of wheat. The rice inventories in Japan had dropped from 7 million to 1.6 million tons. The traditional rice-exporting countries in Southeast Asia had little to offer. The price of rice rose to unprecedented levels, from $400 to $500 per ton, representing a five-fold increase over 1971 prices. Even if a country had the necessary foreign exchange, the world market had very little rice to sell.[2]

As the rice supply dwindled, black market prices escalated. Even then, rice was often not available at any price.[3] City dwellers visited the rural areas to buy, borrow or beg rice from the household supplies of farm relatives, and from any farmers/traders who had some to sell. Marauding "urban locusts" roamed the countryside, thievery from rice warehouses and individuals became common-place, and a period of "quiet panic" began.

The government launched several efforts to counter the public's fears and stabilize the situation. A combined military (Army and Philippine

Constabulary) program was initiated to crack down on rice hoarders and "traffickers". Road blocks were set up to check rice traffic on the highways, and troops conducted searches of dealers warehouse, stores and households, as well as individual farms -- with orders to confiscate "excessive" stocks. Simultaneously, the general public was urged to reduce its consumption (and wastage) of rice. Riceless days were suggested, and restaurants and other eating places were required to mix rice with corn, wheat and other grain "extenders" in order to conserve available supplies. Dealers stocks were also mixed in the same manner, and public fiestas (at which rice was traditionally prepared and consumed in great quantities) were banned along with other traditional uses -- such as throwing it at weddings, like confetti.

Despite these moves to curtail consumption and maintain distribution however, the rice crisis worsened, and production for the crop year 1972-1973 dropped to a critical low of 104.8 million cavans -- the worst harvest since calendar year 1969.[4] At the same time there were now over four and a half million more mouths to feed. Thus the stage was set for a massive rehabilitation program the following crop year. It was in this atmosphere of crisis that a new rice production program -- "Masagana 99" -- was born.[5]

The Technical Thrust

No matter what the experiences of the past have been -- good or bad -- in the agricultural sector each new planting season ushers in renewed optimism for a bountiful harvest, and fresh opportunities. Thus in spite of the dismal experience with Operation Rice Bowl, and even while drought was withering Palagad's standing crops, planning meetings were underway at the NFAC to develop a program for the nation's next principal rice production season -- May through October 1973.

Among the many ideas considered by NFAC, a joint presentation by Peter Smith of the Shell Chemical Company, Inocencio (Bong) Bolo of the University of the Philippines College of Agriculture (UPCA) at Los Baños and Vernon Eugene (Gene) Ross of the Department of Extension, International Rice Research Institute (IRRI) captured the attention of Secretary of Agriculture Arturo Tanco. Their proposal was that an "integrated package of technology"[6] be coordinated by the government and disseminated to rice farmers on a wide scale, to be applied under government extension agent supervision. Based on an "on-farm" research/demonstration program which Ross had conducted with Bolo on some rainfed farms in Bulacan and Nueva Ecija provinces during 1971 and 1972,[7] they asserted that 99 cavans of palay (i.e. unhusked rice) per hectare could be produced -- even on non-irrigated land. The increased yields from such a "package" would be sufficient to attain national rice self-sufficiency by the end of the calendar year.[8]

Secretary Tanco directed the NFAC to establish a joint working group to study the feasibility of launching such a program nationwide; if feasible,

the type, amount, source and cost of resources required to support it, as well as management plan for implementing and monitoring it. There was considerable discussion (and skepticism) within the working group over the actual results attained in the Bulacan field trials,[9] and the likehood of obtaining such yields on a wide scale from small farmers[10] necessary to attain national self-sufficiency .

Furthermore the feasibility of launching a successful national program which necessitated such careful logistical coordination and follow-up supervision was considered highly unlikely without considerably more training and infrastructure development. However, given the dire straits in which the nation found itself, the working group eventually concluded that there was no other real alternative but to attempt it -- like a drowning man "grasping at straws" -- even if the yields attained were not as spectacular as Ross reported for Bulacan.

Management Thrust

While enthusiastic at the prospect of a technical solution that could get the Philippines out of its food crisis, Secretary Tanco was more concerned with NFAC's ability to manage such a program, given the poor state of bureau and provincial information networks and general low level of managerial (as opposed to agricultural technical) competence. A recent study of NFAC's reporting system pointed up many data inadequancies -- none of which has been rectified to date.[11] Extracts from that study illustrate the reasons for Tanco's concern:

> The monthly report is an incomplete historical summary, rather than an action document for management control and future programming.
>
> The narrative is predominantly stereotyped repetition of the tabular data -- i.e. statements of targets and accomplishments. No comment or highlighting is made of exceptional items -- i.e. progress and/or problems, or any follow-up action desired.
>
> Many detailed statistics are provided for top management use; -- i.e. More than 40 page of "worksheet" tables covering over 3,100 separate data items, but trends are buried in the detail.
>
> Statistics reported "too precisely" - often in decimals to the last hectare/kilogram/ centavo, etc., when they could be rounded to the nearest thousand, and condensed in the tables.
>
> Lack of reporting discipline. Inconsistent reporting -- 26 provinces reporting one month, 12 another -- and incomplete data in the reports. Some report several months late.
>
> Reports tabulated without comment on the missing data -- thus an unsuspecting reader would infer that the reports were complete.
>
> Cumulative totals on the latest report often do not tally with the previous month's "Cumulative" plus "Current Month" total.

> In many instances, No data is reported for "This Month"; while in others, targets are drastically under-achieved, but with no comment on reasons of follow-up action taken.[12]

Thus, Tanco wanted some assurance that not only was the technical proposal sound, but also that the program could be managed effectively with a formal, rationally-structured management information system. This system was to monitor key indicators and provide frequent "progress against target" status information, as well as highlight problems. It was also envisaged as a system that could be used by the central NFAC management staff and the provincial managers.

With the first seasonal plantings imminent, the skeletal idea was translated into substantive administrative reality. A detailed plan was developed -- outlining time-phased commodity support (seeds, chemicals, credit etc.) required, and the field personnel and management structure necessary to supervise and monitor a short term (one-season) intensive nationwide effort to reach approximately 400,000 small farmers, with a target to plant 600,000 hectares in 43 of the nation's 76 provinces, for an average yield of 99 cavans per hectare. For management purposes, a control-type Management Information System was also designed, with guidelines for its use, and mandatory orientation recommended for those who would use it.

Such a plan necessitated unprecedented cooperation between the central government and provincial authorities, and compliance by the many farmers who would be involved. In addition to several managerial innovations, a certain amount of "coercion" was also necessary to overcome some of the obstacles traditionally encountered in the agro-business environment and traditional extension approaches, and to keep the program on schedule. One perceived advantage -- from a programmatic standpoint -- was that the nation was under Martial Law[13] and "cooperation" could be more readily expected from many otherwise recalcitrant organizations and individuals. Secretary Tanco presented the plan to President Marcos and it was rapidly approved. The name of the original Bulacan experiment -- "Masagana 99" -- was retained.

Agricultural Policy Assumptions

Agricultural Extension

The Masagana 99 program required farmers to utilize high yielding variety seeds (HYVs), apply fertilizers and other chemicals, and carefully follow certain procedures in a strict time sequence. The HYV technology developed by IRRI was quite new and Masagana's farming methods differed in some critical aspects from traditional practices. Despite its limited introduction through prior programs, HYV technology was still generally

unknown, misunderstood, or -- since the outbreaks of Tungro which has caused extensive crop losses -- feared. Thus one major policy thrust was to mobilize the large extension force to reach out, recruit, support, and teach farmers how to grow the new high yielding variety rice properly.

Credit

NFAC perceived that lack of money was another major obstacle preventing farmers from adopting the HYV technology. The Masagana policy therefore called for widespread dissemination of short term credit[14] without collateral, at low interest rates, to small farmers through several lending institutions -- the Rural Banks (RB),[15] the Philippine National Bank (PNB) and the Agricultural Credit Administration (ACA).

Program Implementation & Achievement

As indicated earlier, Masagana 99 was initially conceived as a one season program -- the regular wet season of May-October 1973 -- with program target of 600,000 hectares. Based on the information available, the central NFAC Management Committee determined and assigned individual targets to each province, for each month's planting. Because of a number of planting shortfalls, although the overall target had been planted by October 1973, some provincial quotas were extended, to be fulfilled by the end of the crop year (May 1973 - April 1974). The subsequent Palagad season (November 1973 - April 1974) was designated Phase II -- for farmers who had irrigation available, or in areas with a high probability of rainfall. The overall target was also increased to one million hectares to be met by the end of the crop year, although there was considerable variance within and between the participating provinces. The initial success of (and continuing need for) the program was formally recognized by President Marcos at an awards ceremony at Malacanang Place on May 22, 1974. Marcos stunned NFAC officials however, by announcing an impromptu extension of the Masagana Program to a Third[16] (and what ultimately proved an indefinite) term, as an intensive, high-priority, annual campaign.

Masagana was the nation's priority rice program, directed at increasing small farm production, but it only encompassed about one-third to one-half of the total rice production hectarage in the Philippines. National rice production data were therefore developed from a broader base by the Bureau of Agricultural Economics (BAECON). A summary of hectares harvested and yields are tabulated below, and together with a graphic indicator of self-sufficiency, are also shown in the charts on the following pages.

Table 1. Selected National Rice Production Data

Crop Year	*Masagana Phase*	*Hectares (millions)*	*Cavans of Palay (millions @ 44 Kg/Ca)*
1972/73	Pre Masagana	3.2	104.8 National Crisis
1973/74	I & II	3.5	132.7
1974/75	III & IV	3.6	134.3
1975/76	V & VI	3.7	146.2 Self-Sufficiency
1976/77	VII & VIII	3.6	153.2 Exportable Surplus

The Masagana 99 Program was thus widely acknowledged as a success. The nation achieved its goal of self-sufficiency in rice production in 1976, and the Philippines became a rice exporting nation again in 1977 -- a path from which it did not falter until 1985.[17]

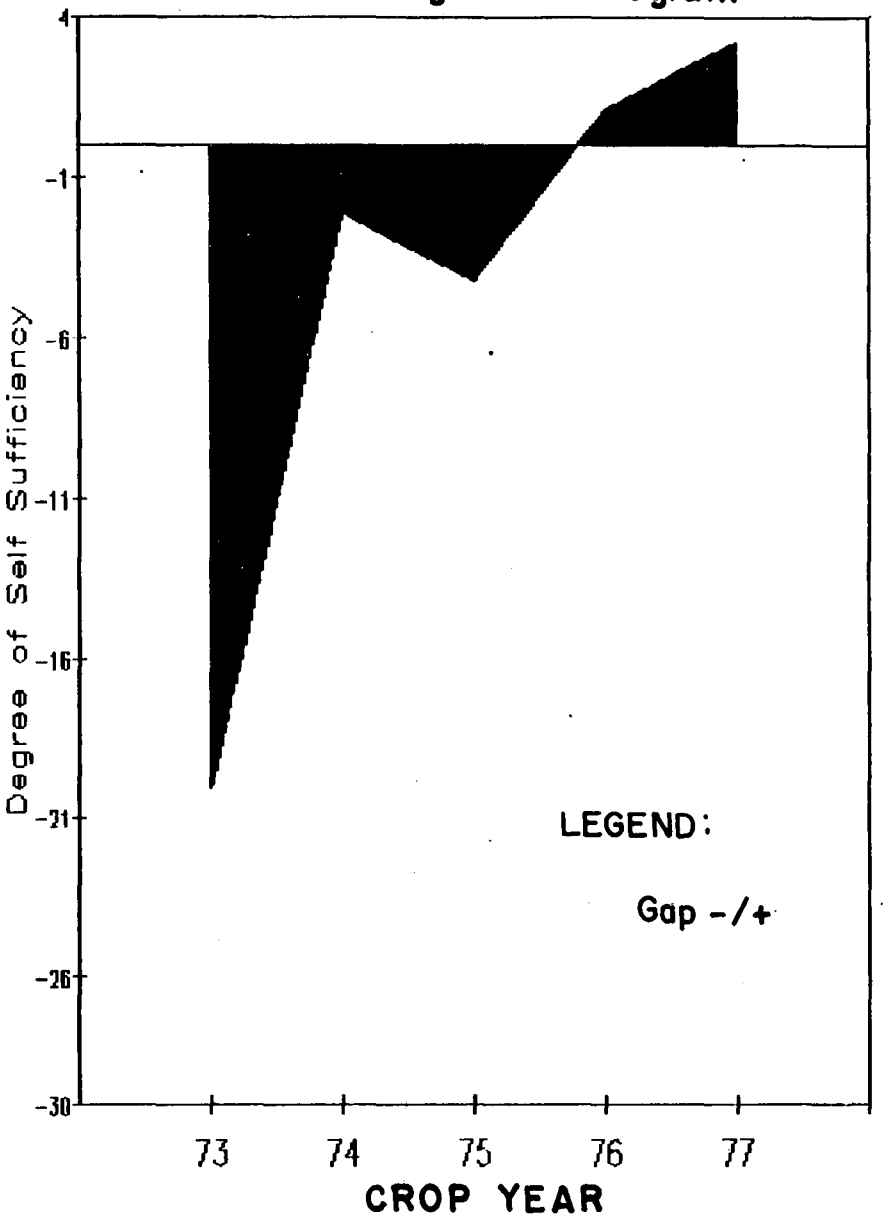
Analysis of the Masagana Program and its Policies

Measurement of program performance is an important aspect of a Management Information System (MIS) for two main reasons: (1) During implementation, appropriate data, periodically compiled and presented, provides management the ability to determine the extent to which the project is proceeding towards, and attaining, its stated objectives, and to react to potential problem situations where (if warranted) there is still time for remedial action; and (2) The information derived from the MIS, together with some collateral evidence, also provides the basis for *ex post facto* evaluation --

Table 2. Masagana Program Performance as a Percentage of Target

Phase	*Masagana Target (000 ha)*	*Plantings Actual (000 ha)*		*Harvested Actual (000 ha)*		*Production (Million Cavans) (@ 44 kg/Ca)*	*Masagana Yields (Ca/Ha)*	*Percent Target (%)*
			(%)		*(%)*			
I	600.0	707.5	118%	681.9	114%	56.7	75.6	76%
II	400.00	451.8	113%	380.1	95%	30.0	78.9	80%
III	901.6	1,131.1	126%	927.0	103%	63.3	68.3	69%
IV	579.3	706.3	122%	695.1	120%	58.6	84.3	85%
V	1,140.1	1,086.3	95%	1,043.7	92%	87.6	84.0	85%
VI	646.3	667.9	103%	645.6	100%	50.0	77.5	78%

Figure I. Philippine Rice Self-Sufficiency Shortfall/ Surplus @ 95 Kgs./Capita. Crop Years 1973-1977 The Masagana 99 Program



i.e. determining the extent to which the Program attained its objectives, and the appropriateness of the program's policies. This is particularly important, for, as Landau has pointed out:

> Policies are hypotheses . . . and they belong to the class of unverified propositions. Accordingly, the projects they give rise to are experiments.... If a project is not treated experimentally, if its hypothetical status is not respected, it will be managed as if there is nothing to learn.[18]

As a comprehensive, systematic, approach to gathering detailed data on program activity and support to the target farmers, the Masagana MIS data series was indeed used extensively for monitoring and comparative provincial program activity. From the information available, a number of retrospective observations can also be made about the Masagana program's implementation, the quality of the data, and the program's agricultural policies with respect to: (1) extension agent utility and; (2) non-collateral, low-interest, credit for small farmers.

As indicated in Table 2, Masagana planting targets were met (or exceeded) each season except Phase V, and even though affected by weather and other problems, the area harvested also generally exceeded expectations (except Phases II and V). It is noteworthy however that Masagana's overall program target of 99 cavans per hectare -- although attained by numerous individual farmers -- was never reached in the aggregate.

Extension Agents and Priority Provinces

Categorizing provinces as: (a) High Priority; (b) Regular or; (c) Associate Provinces was a deliberate strategy enunciated by Secretary Tanco to assuage the political sensitivities of the Provincial Governors and simultaneously manage the appropriate disposition of Masagana's resources. About fifteen provinces were designated Priority Provinces each season. These were traditionally high producing provinces, which collectively provided over half the Program's production during the Phase. Most of those so designated continued as priority provinces from Phase to Phase; but a few slipped in and out of the category as a function of their seasonal production targets. After the second Phase, thirteen (later extended to fourteen) other provinces were permitted to join the program in an Associate status -- largely for reasons of political equity. The extent to which this strategy was actually observed in practice can be determined from examining the MIS reports.

There is no MIS data on the resources under the control of the central managers that were available for redistribution to the provinces, except the assignment of personnel. The assignment and reassignment of Production Technicians (i.e. extension agents) was not centralized, or directed by NFAC, but the number associated with the Masagana Program could be influenced

by them. Most individuals were assigned to the field offices of National Agencies in the province, and detailed to the Masagana program on a temporary basis.[19] Many others were provincial government personnel. The number of technicians assigned in the provinces to work on the Masagana program was reflected in the monthly reports. Using this variable as a proxy measure, from an analysis of the MIS data, the effective disposition of Production Technicians in the Masagana program can be determined in terms of these Priorities, as indicated below.

One could reasonably expect that if NFAC discriminated programmatically between the three categories of participating provinces, the High Priority ones would receive the lion's share of attention and resources, while the Associate provinces would suffer from benign neglect. However, an inspection of the MIS data reveals that the High Priority Provinces were only accorded "high priority" treatment for the first two Phases. The total number of production technicians in the program increased by over six hundred after the first year -- from 3,174 to 3,813 in Phase VI. Even though the High Priority provinces retained the highest number of agents throughout the life of the program, they lost their preeminent standing. Associate provinces -- while remaining in a clear numerical minority -- gained the new personnel disproportionately to their workload. The charts on the following pages reflect the MIS data.

Credit

Credit was a second key variable on which data were collected to evaluate the impact of the non-collateral credit policy. Unfortunately, the credit aspect of the Masagana program experienced major problems in the provinces during implementation, and deviated sharply from the plan.

With some preliminary coercion by President Marcos[20] -- and some concessions and guarantees by the government -- the bankers provided non-collateral credit to participating farmers, as requested. After the initial Phase, however, it is apparent from the Masagana MIS data that the loan recipients' enthusiasm for repaying their dues waned. Even with restructuring[21] necessitated by crop failures, as indicated in the Table below, the repayment rate declined and was not viable after Phase II.

Table 3. Repayment Rates of Non-Collateral Production Loans by Masagana 99 Farmer Participants

M-99 Phase;	*I*	*II*	*III*	*IV*	*V*	*VI*
Repayment Rate;	94%	93%	84%	81%	74%	78%

Even these MIS-reported rates are more positive than the true small-farmer credit situation, for three reasons: (1) By "restructuring" the loan, its "due" date was extended for another season. For book-keeping purposes, however, the outstanding loan was fully paid up and a new loan agreement was initiated. Thus, although the reported repayment rate was not deliberately inflated, it did distort the effective repayment picture because it was really higher than farmers were actually paying -- either because they were unwilling, or unable, to pay; (2) Ultimately, when it was apparent that many loans were indeed uncollectable, some were "written off" the banks books.[22] By diminishing the denominator of "loans due", this "write-off" policy also had the effect of inflating the reported repayment rate; and (3) When farmers became delinquent in their obligations for no good reasons, the banks had little option but to refuse them further credit. Thus the pool of eligible farmer-borrowers grew smaller each season, which had the effect of improving the true repayment rate.

Despite government appeals, incentives,[23] threats, and ultimately action to jail some of the more prominent delinquents,[24] attempts to collect small farmer non-collateral loans were mostly to no avail.[25] Consequently, the government's aspirations for long-term viability of the credit system -- precarious at best -- were never realized.

From the program management perspective, the nation still needed the participation of these farmers in the high-technology, high yielding variety Masagana program to bolster national production levels. The "pragmatic" compromise at the local level was a general decision to waive the earlier credit requirements and many farmers were enrolled in the program in subsequent phases without credit, so that total numbers did not diminish.[26] Whether or not these latter non-credit farmers were adequately financed from other sources is not indicated.

Assessing the Quality of MIS Data

Masagana was the nation's priority rice program, directed at increasing small farm production, but it only encompassed about one-third to one-half of the total rice production hectarage in the Philippines. National rice statistics were therefore developed from a broader base. Although various offices and managers were free to conduct surveys and gather data for program planning and management purposes, the BAECON was the "official" gatherer and guardian of Philippine national agricultural statistics.

As described above, the monthly Masagana 99 MIS reports were used by NFAC and other agencies for operational program management purposes. There were no illusions, however, about the dubious quality of data reported by extension agents on their own performance, or by farmers responding to

questions from government officials and strangers conducting surveys on highly sensitive personal income-related matters. One of the most positive features of the Masagana 99 Program was that administrators made a number of efforts to check on the quality of the data. NFAC (and other organizations) attempted to verify MIS data through other means, as well as to conduct independent research on this contemporaneously popular topic. Several of these special studies and "unofficial" reports, as well as BAECON's "official and authoritative" Philippine government rice statistics, are reviewed below to help draw some conclusions about the degree of accuracy (and ultimate utility) of the Masagana MIS data series, for as Irving Spergel says:

> We have to live in the world as it is and use all the resources and "goodies", adulterated as they may be.... Different views of the elephant, even through different sets of ill-fitted glasses, are helpful. Hopefully the views are not of different elephants.[27]

Several different sources of data on rice production were examined, in an attempt to corroborate the data reported by the provincial extension agents, as follows:-

1. Masagana MIS Staff Provincial Yield Follow-up Surveys.[28]
2. Special Studies Division, (SSD) Department of Agriculture.[29]
3. Institute of Philippine Culture, Ateneo de Naga.[30]
4. Bureau of Agricultural Economics (BAECON) Study of Selected Masagana Participants, Iloilo, Crop Year 1976/77.[31]
5. Gary Lewis Study.[32]
6. Elsa Mateo-Bayani Study.[33]
7. BAECON Integrated Agricultural Survey (IAS).[34]

In general, these studies revealed that there was a tendency on the part of the production technicians in the provinces to exaggerate the yields of their farmer-cooperators. While these surveys were limited in that they do not provide comprehensive time coverage, are not available for all provinces, and there is wide variance in the yields between the provinces surveyed; nevertheless in each case the inflationary trend in the MIS-reported data is apparent -- on the order of 44 percent.[35]

The glaring differences between BAECON's official statistics on rice production and yields, and the levels observed by others was a constant source of frustration and acrimony, especially after the early Phases of Masagana reports were refuted by BAECON, but the issue was never fully joined, and the discrepancies were never resolved. Throughout the Masagana

program, the Philippine Department of Agriculture continued its schizophrenic stance, - using NFAC MIS data for program monitoring, management and publicity purposes, and BAECON data for "official" analysis and economic policy decisions;[36] while outside agencies constantly questioned and criticized both.

Follow-up interviews with USAID (Unites States-Agency for International Development), NFAC and BAECON officials elicited a variety of opinions about the accuracy of available rice statistics, and the data gap. Although the Masagana data was reported by production technicians and PPOs with vested interests in inflating the results -- and it appears that this in fact did occur -- NFAC actively worked to limit the error rate by its follow-up visits and surveys. The NFAC MIS data was thus more comprehensive, sharply focussed, extensively gathered, intently monitored, scrutinized and cross-checked than the smaller, more broadly ranging, less frequently conducted BAECON IAS sample, and served NFAC and the Provincial managers (Governors, Mayors, PPOs and others) operational program needs, as the IAS could not.

The MIS follow-up surveys indicate the potential range for error in specific provinces, while the SSD studies are probably a more representative reflection of the overall situation. Although the BAECON data appears to be on the low side, and there are many plausible explanations for this, unfortunately there is no objectively verifiable evidence to determine its degree of accuracy. Thus, for better or worse, two series of statistics persist: (1) the "official" pessimistic BAECON IAS data and; (2) the higher "unofficial" Masagana series which although internally processed in a consistent manner, are largely irreconcilable. Thus, given the hazards of collecting data in the Philippine rice production sector, no judgements can or should be made, or economic policy formulatecd with any data without a great deal of trepidation. Nevertheless, between 1973 and 1977, the MIS data was used and proved useful as a systematically integrated data base for monitoring and managing program performance.

Summative Program Evaluation

While the Masagana MIS was designed primarily for program/project monitoring and formative evaluation, nevertheless the system was useful for summative evaluation as well. A close examination of the BAECON IAS data juxtaposed with the Masagana MIS data indicates that -- at the margin -- new area production contributed more to the program than increased productivity. First, from the "before" and "after" IAS data, the net change in area farmed and total annual production obtained from that area was calculated, as follows:

Table 4. Net Change in Overall Production of Palay from CY 1972 (Baseline) to CY 1976 (Program End)

		Has (mil)	*Palay (mts)*	*Palay (ca/ha)*[37]
1972	(Baseline)	3.3	5.3	36.3
1976*	(Program End)	3.7	6.4	39.8
*The 1976 data was comprised of:				
	Masagana	1.7	4.2	56.6
	Traditional	2.0	2.2	25.0

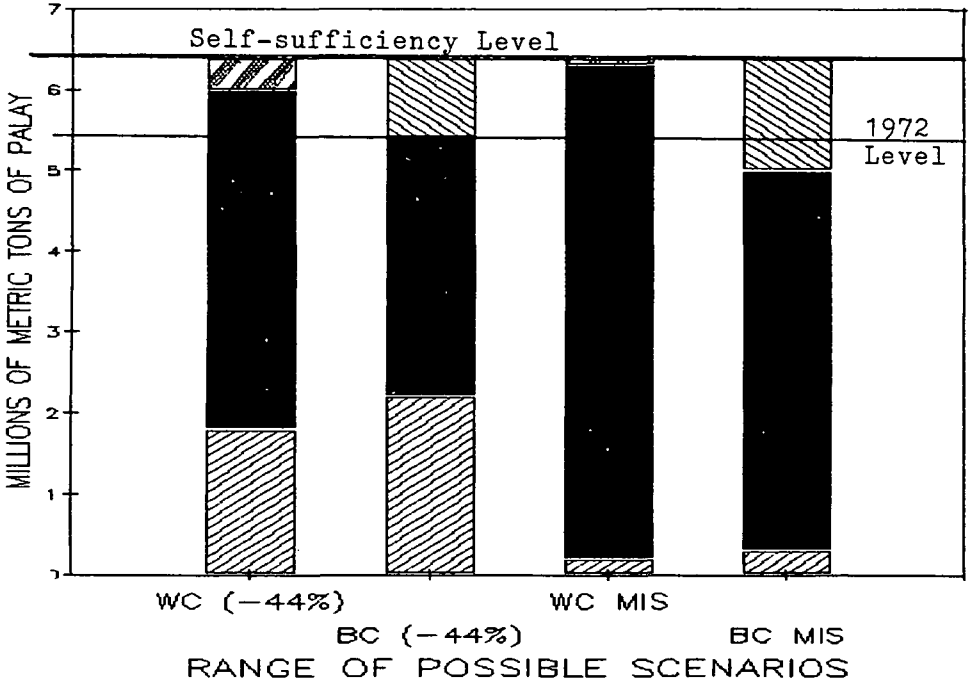
Thus the increase of 1.1 million tons production of palay and the expansion of 400,000 hectares in 1976 over the 1972 Crop Year could have been accomplished by any permutation within the ranges of the "Worst Case -- Best Case" scenario outlined graphically on the following page.

In essence, although the yields were below the 99 ca/ha targetted, the Masagana Program did break the long pattern of under-productivity, and set the stage for continued growth and self-sufficiency, even with the continual incursions of population growth.

In evaluating project performance, an aspect worthy of further explication is the perspective one takes in measuring progress. Development projects are usually formulated to provide "more and/or better" quantities/ qualities of something which is seen as desirable. That something can usually be measured. In the case of the Masagana Program, a target of "99 canvans per Hectare" (@ 44 kilos per cavan) was established, and was readily measurable. The fact that the program fell short of this objective and only attained 84.3 cavans/hectare at its peak performance (or 85% of its target) -- if one accepts the reported yield at face value -- is the typical way of measuring accomplishment. Measuring from the base line of 36.3 cavans per hectare, the same data shows that the Masagana program raised average small farmer productivity to 84.3 canvans/hectare. In other words, the net program impact was an increase of 132%, or more than double what it was before. This is not simply statistical sleight-of-hand but *de facto* accomplishment -- as apposed to *a priori* conjecture -- and is thus a much sounder basis for measuring progress.

The Masagana MIS was useful for policy analysis. Utility is defined here as the ability of the MIS data to provide a definitive answer to the question "Where these policies based on correct hypotheses?" The three policies for review were: *Self-Sufficiency* --i.e. that the target of 99 cavans per hectare was appropriate to attain self-sufficiency; *Technical Supervision* -- i.e. that

Figure 2. Palay Production - CY 1976 Attributable to New Areas and Methods and/or Traditional Ways BAECON & MIS Data



Legend:

- M 99
- New Traditional
- M99 Prev. Trad'l
- Old Traditional

WC - Worst Case
BC - Best Case
-44%-The reported Masagana MIS data, deflated by 44% (to bring it more in line with the more realistic estimates indicated by other surveys/studies of BAECON and other agencies/ organizations).

extension agent supervision was essential for increasing small farmer productivity and; *Credit* -- i.e. that non-collateral credit was essential for increasing small farmer productivity.

Self-Sufficiency

From a summative evaluation standpoint, it would be important to determine whether 99 Cavans per Hectare was a feasible and desirable objective. The issue of feasibility can be resolved quite perfunctorily. The program was based on a yield potential claimed to have been attained in field research trials on rainfed paddy, and it was asserted that any farmer could anticipate a similar yield if the recommendations were conscientiously followed.

While these claims were questioned in some quarters, certainly during the life of the program numerous farmers who adopted Masagana's 16-step *Makabagong Paraan* approach exceeded 99 cavans per hectare. Indeed, even many who did not strictly adhere to the 16 steps were able to meet and beat this threshold. For instance, an independent study of farmers in San Simon, Pampanga reported:

> From interviews with the farmers of the San Simon Area, it is suspected that the farmers skimp on the inputs for their farming as provided for by the loans that they incur from the rural banks, diverting part of the bank loan into cash for family and personal expenses. This is partly the reason for the relatively low yield of the area amounting to an average of only 102 cavans of palay per hectare.[38]

Thus, there is little to be gained by examining the feasibility of 99 cavans per hectare further, unless perhaps it is to question whether the target was set too low.

The desirability of "99" cavans as a target, however, must be viewed from two different standpoints: namely; (1) Economic and (2) Psychological Impact.

Ninety-nine cavans per hectare would indeed have produced *"Masagana"* -- i.e. a " bountiful harvest." In fact, such spectacular success on the one million hectares targetted for the Masagana 99 program would not only have produced national rice self-sufficiency; it would have created a rice glut of unprecedented proportions. Such an increase in production levels would have wrought instant disaster for the national economy as well as the majority of the small farmers involved. The capacity to move, market, process and/or store such quantities simply did not exist and could not be developed in so short a time-frame. Consequently, there would have been much wastage, and the selling price would have plummetted below the cost of production, to the farmer's detriment. While perhaps an urban consumer's delight for the short run, the effect for the following seasons would have been to drive rice farmers out of production, until the detrimental impact had ameliorated. In essence,

assuming no stock on hand, self-sufficiency could have been attained in Crop Year 1973/74 with a total annual production of only 5.9 million metric tons of palay[39]. Thus, by calculation, a "rational" Masagana 99 target production level would have been only 50 cavans/hectare, in effect, a thirty-eight per-cent increase over "normal" production levels.[40]

Numerically, even a 38% improvement over "normal" is not trivial, and recovering from the effects of the 1972/73 disaster was an additional major undertaking, psychologically, physically and economically. Not only was a minimum fifty-three percent improvement required on the part of the Masagana farmers,[41] but recovery efforts had to reestablish the infrastructure and restore the small farmer's capacity to produce -- a task which would normally be much longer than a one season undertaking. Furthermore, because of the disaster, many farms were permanently lost to rice production. Thus Masagana production had to compensate for both a reduced rice area and abnormally low productivity from remaining non-Masagana farms. Targetting had to take these uncentainties into account.

The gap between paucity and plenty in rice production is almost as thin as glume -- where abberations in milling result in either poor quality "brown" rice, or a high wastage of the white. The economic and political consequences for missing production targets -- in either direction -- are also catastrophic. In establishing palay policy and setting production objectives -- while 99 cavans per hectare was technically feasible, and "99" was incessantly drummed into the national consciousness as a popular target -- from a National Self-Sufficiency standpoint, 50 cavans per hectare would have been an acceptable "fall back" position, other things being equal.

Although a 50 cavan/ha *"Masama na 99"*[42] might have been "sufficient" to attain national self-sufficiency, it would have been far from adequate in terms of individual farm-production economics, as other studies revealed that the more input-intensive and expensive high yielding technology of Masagana 99 was only profitable when levels of production exceeded 60 ca/ha,[43] while production between 60 and 99 cavans/hectare, while profitable, incurred considerable capital outlay as well as risk exposure.[44]

Despite both the technical feasibility for increasing production levels to 99 cavans per hectare, and the public pressure to do so, the actual increases apparently experienced by Masagana farmers were (for the most part) only marginal. Assuming that farmers were rational, this tends to support the hypothesis that basic economic considerations -- such as "production-possibilities," "supply-demand," and the law of diminishing returns -- were overriding constraints to higher yields rather than a lack of technical knowledge or credit.[45]

Although the name "Masagana 99" was borrowed intact from the earlier IRRI experiments in Bulacan and Nueva Ecija, 99 cavans per hectare was a

feasible micro-target for an individual farm, as well as a Public Relations "gimmick". However, it was not a nationally-targetted ratio of attaining self-sufficiency.[46]

Aiming for a 200+% increase[47] -- when 53% would suffice -- seems excessive, and is certainly beyond the bounds of "fine tuning." But, despite the devastating consequences of deviation, economic development is not a suitable environment for precise programming -- as critics are prone to point out. Thus in setting production objectives, the palay policy-makers had to weigh what was desirable, what was feasible, what was marketable; and what, realistically, was probable and sustainable under the prevailing circumstances. This required a humanistic approach and a cultural sensitivity -- not a mechanically analytical computation. As President Marcos himself expressed it:[48]

> We have to admit, we Filipinos have this national vice, this weakness, this flaw in the character of our people and that is the *ningas kugon*[49] mentality.

In summary, while 50 cavans/hectare was a rational target for attaining national self-sufficiency, given the Philippine setting at that time; whether "99 cavans/Hectare" was an appropriate publicly-proclaimed objective, cannot be objectively determined.

Technical Agricultural Policy Considerations. It will be recalled that the Department of Agriculture thought there were two principal technical constraints to small farmer adoption of high yielding rice technology to improve productivity in the Philippines; i.e. (1) Lack of extension agent contact to provide the technical know-how to the farmers and (2) Lack of credit to enable farmers to procure the necessary inputs.

Consequently the fundamental policy innovations upon which Masagana's development was structured were: (1) Transferrence of Technology -- through close identification and supervision of participant farmers by Production Technicians and; (2) Non-collateral Credit -- to enable the farmer to procure the technical inputs which the high yielding varieties required.

Technical Supervision

During implementation, tremendous emphasis was placed in the Masagana Program on recruiting, training and deploying production technicians to enroll and assist rice farmers to learn about, and apply the new high yielding technology. A correlation between provincial yields and their technician/farmer ratios during a crop season could be indicative that the supervisory extension agent policy was appropriate.[50] Such a correlation study was done, but there was absolutely no correlation between these variables on this

program policy indicator for any of the Program Phases. To the contrary, and unequivocally -- farmers' productivity was completely indifferent to the level of attention received from production technicians -- or which could have been received. It was as though admission to the program -- via the technician's certification -- was sufficient to generate the higher yields, not the continuity of the potential contact.[51]

This finding was contrary to my subjective impressions that the production technicians were working hard to assist farmers, and the Department of Agriculture's general expectation that higher yields would result from such efforts. It can only be concluded that -- whatever else they might have contributed to the Masagana 99 Program -- the production technician's anticipated supervisory contact role was an insignificant factor in the farmers' attaining higher productivity. While counter-intuitive, the fact that the technician's supervisory role is, to all intents and purposes, negated -- is nevertheless a highly significant finding for it leads to an unforseen conclusion -- something else made the difference (or negated the "supervisory intensity" aspect).

Credit

A similar picture emerged from conducting correlations of "non-collateral credit" with "productivity" data. Unfortunately, because the credit aspects of the program were substantially modified during implementation, such analyses were not feasible for the most part. The traditional wisdom was that inaccessibility to credit was one of the major constraints to small farmers adopting modern technology to attain higher yields. A logical assumption flowing from this was that the more credit provided per hectare (up to a point), the higher the yield was likely to be. Credit was thus provided to thousands of farmers in the Masagana Program as a conscious policy, in varying amounts, at great cost and effort. Yet an analysis of the MIS data reveals another counter-intuitive finding -- i.e. that *ceteris paribus,* the amount of credit per hectare had no discernible impact on farmers' productivity.

In other words, despite the best efforts of a large workforce, and an intensive campaign to provide millions of pesos in loans to small farmers, analysis of the data indicates the apparent inefficacy of non-collateral governmental credit for small farmers -- from the standpoint of both cost and benefit -- in terms of boosting productivity.

Summary

These findings about the Masagana Program's fundamental development hypotheses were completely contrary to expectation. It should be emphasized that the findings obtained and reported here are Masagana-

specific. It should not be inferred that these findings are generally applicable to other agricultural production programs.

It must be remembered that the Masagana 99 Program was a verifiable success -- not merely a public relations feat. The objective evidence is that the nation did achieve its goal of self-sufficiency in rice production in 1976 to the point that the Philippines became a rice exporting nation again in 1977. Since Masagana's twin strategies -- intensive extension agent supervision and follow-up of farmers, and heavy infusions of credit -- were not critical factors in increasing small farmer productivity, this gives rise to another question. If program success was not due to the massive infusion of extension assistance and credit, to what then does Masagana owe its reputation for success? The most plausible explanation is that intensive supervision was unnecessary because concomitant media campaigns transmitted the new technology adequately.

Detailed information about the Masagana Program was developed and disseminated in a hitherto unprecedented campaign. The J. Walter Thompson advertising agency donated its services at less than half its standard rates,[52] and assisted the government's National Media Production Center in transmitting Masagana's *Makabagong Paraan*[53] message to farmers in innovative forms -- particularly by radio.

> Radio was the most pervasive communication media used to mobilize and educate the Filipino farmers. Seventy-four percent of the Filipino population own radios, and broadcast radio reaches 85 percent of the island population. Three out of four farmers own a home transistor radio. During the campaign, radio was used in three different ways.... Radio for Promotion ... Radio for Information ... Radio for Instruction.[54]

These broadcasts were handled by specially trained farm management technicians -- "Farmcasters"[55] -- who covered everything from detailed technical advice, hard-sell spots, promotional skits and "soap opera dramas;" to on-farm interviews and discussions of concern to farmers; as well as progress reports.[56] The Masagana jingle[57] was plugged incessantly, and -- fortunately -- was an instant national "hit tune".

It is thus possible that the impact of this media blitz swamped any other direct transferral of technology effect by the production technicians. Unfortunately, for evaluative purposes, data was not systematically gathered to measure media impact. Thus, while it is highly plausible that the communications media not only supplemented, but surpassed, the production technician's extension efforts, there is no adequate "objectively verifiable" data base available to test this hypothesis.

A related proposition in connection with the provincial management aspects of Masagana 99 was that "smaller scale programs are more effective

than larger ones." If this proposition had held true there should have been some clearly observable correlation effects between provincial "average per-hectare yields" and the provincial "area harvested." The MIS-reported evidence did not bear this out. The size of the program managed at the provincial level had no discernible effect on the results attained.

Conclusion - Summative Evaluation of the Masagana Program

The Masagana 99 Program -- with a boost from Palayan ng Bayan -- was indeed successful in attaining national self-sufficiency in rice production. By exerting their efforts to this end, the many farmers, production technicians, and others who waged this "war for national survival" helped stave off economic distress and much human misery. However, the euphoria which follows victory should not deter one from a closer scrutiny of the skirmishes. Hindsight provided another perspective which should abate somewhat the national monomania for Marcos' Masagana Program. While the Masagana program was undoubtedly the vehicle which "lit the fire" and fomented the public's enthusiasm -- the program's actual achievements were much more mundane than anticipated, and even this degree of success was more fortuitous than finessed.

Furthermore, from a policy standpoint, neither the intensity of technical supervision, nor the provision of non-collateral credit, by the government had the intended impact. In short, Masagana 99 was successful in assisting the nation to attain self-sufficiency in rice production, but (in so far as the program policies were concerned) -- for the wrong reasons. From an analysis of both the overall BAECON IAS and the Masagana MIS, one significant conclusion emerges: at the margin, expansion of hectarage planted to rice was the key to the Philippines attaining self-sufficiency in crop year 1976; not simply increased yields per hectare, as was original anticipated.[58] This finding is even more significant because of its counter-intuitive nature.

This is not to say that the higher Masagana yields were unimportant; they obviously were, accounting for the bulk of the nation's production in 1976. Nevertheless, even at the higher productivity levels attained, self-sufficiency would not have been achieved on the 1972 hectare base. Thus, from this standpoint, the impact of the Masagana Program to attain national self-sufficiency in rice production can only be considered a "qualified" success.

In conclusion, during implementation, the Management Information System provided the focal mechanism for Masagana's managers to monitor their program. Its utility does not have to end there, however. By heeding this *ex post facto* examination of Masagana's policies, the MIS can continue to benefit today's researchers, agricultural policy makers and development administrators.

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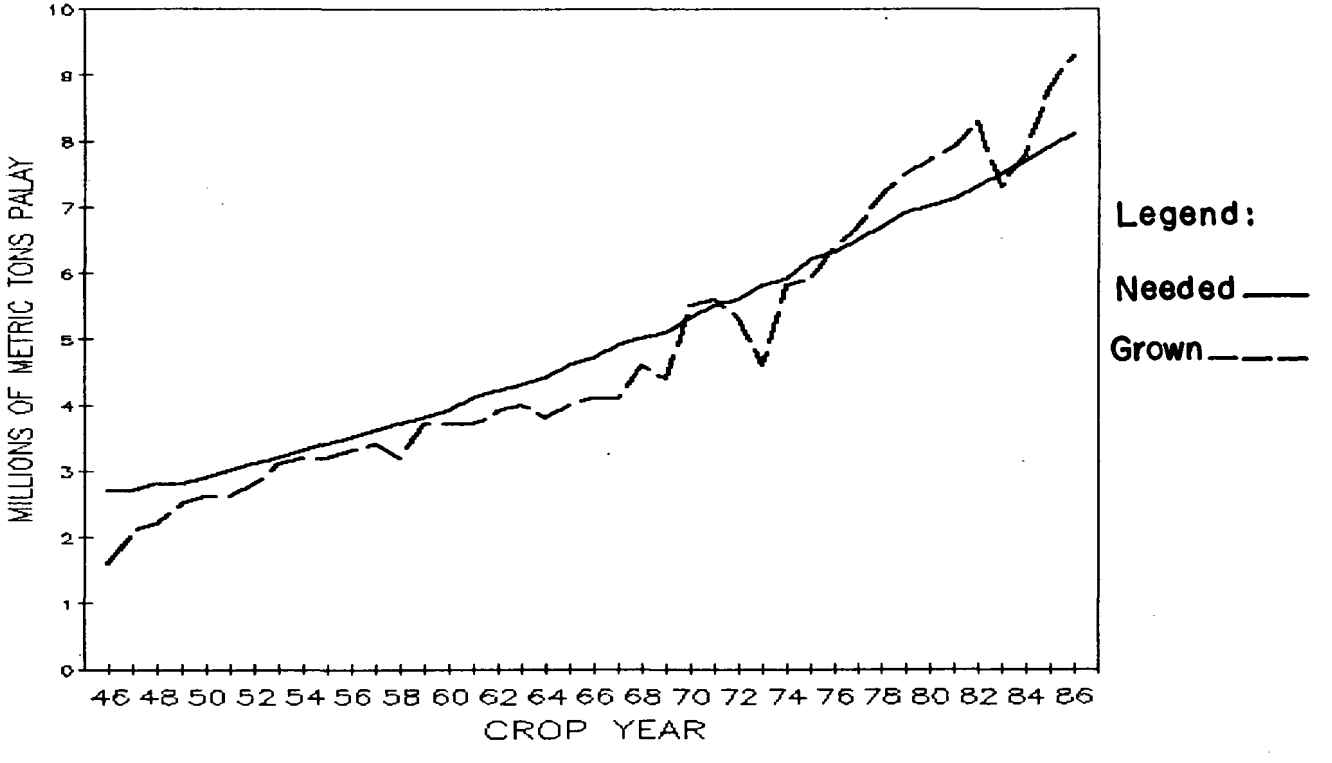
Figure 3. Palay Production and Self-Sufficiency@ 95 kg/capita
Crop Years 1946 - 1986



Endnotes

[1]Provided by the U.S. Agency for International Development (USAID).

[2]J.D. Drilon, Jr., "Masagana 99: An Integrated Drive in the Philippines," a paper presented at the Bellagio VII Conference, Montreal, Canada, on June 1-4, 1975, in Gary Lewis, *The Extension-Outreach Component of the Masagana 99 Rice Production* (Laurence University, California), pp. 37-38.

[3]Normally, the average rural Filipino consumed rice as the main course of every meal. Fortunately, the intensive short-term "Green Revolution" "backyard" vegetable production program was highly successful, and helped stave off widespread hunger.

[4]Note: a cavan is a Philippine measure. A cavan of palay (paddy rice) at that time was equal to 44 kilos. (It has subsequently been stardardized at 50 kilos.)

[5]*"Masagana"* means "bountiful" in Tagalog -- a major Philippine language, while the "99" referred to the target yield of 99 cavans per hectare, or approximately 4.25 metric tons.

[6]High yielding variety rice seeds, fertilizers, weedicides, pesticides, credit and technical assistance.

[7]These tests were conducted in cooperation with the Bureau of Agricultural Extension, and supported with inputs (fertilizers, herbicides and pesticides) by the Shell Chemical company. In essence, the Bulacan tests -- known locally as ***"Masagana 99"*** -- indicated that a carefully designed package of inputs could be developed to complement a systematic schedule of farming operations which farmers could be taught, and supervised to follow. The Bulacan experience had demonstrated (at least to Ross's satisfaction) that a "package" approach was technically sound under real farm conditions, administratively feasible to coordinate and supervise, and profitable for the farmers. For further details, see Inocencio C. Bolo, Vernon E. Ross and Leonardo T. Almasan, "Results of Rainfed and Upland Applied Research Project in Bulacan and Nueva Ecija," a paper presented at the IRRI Saturday Seminar, Los Baños, Laguna on December 16, 1972.

[8]IRRI had already demonstrated that yields of 200+ cavans per hectare, per season; and two or even more crops per year, were possible under carefully controlled, experimental field-laboratory conditions. But transfer of this "high technology" capability to farmers fields had been quite disappointing. Traditional yields were on the order of 35 - 50 cavans per hectare; and without controlled irrigation, most farmers limited their rice farming activities to a single regular, or "wet" season.

[9]For instance, one of USAID's senior agriculturists, Allan Hankins contended that although the reported yield might have been at the rate of 99 cavans/ha from the area actually harvested, he suspected that the farmer's true economic yield -- based on the original area planted -- was probably considerably lower, since "failure" trials were often discounted in agricultural experiments (i.e. the `right tail' research syndrome). There is some merit to Hankins' position. Despite much digging, I have been unable to revalidate the Bulacan yields (in farm planting and production terms) from reports on file at NFAC, IRRI, or UPCA/Los Baños. Ross refers to 493 "trials", but he never provides a base hectarage for either planting or harvesting, and there is no assurance that they were the same. Furthermore, typically such trials were conducted on a portion of a farm which was considerably less than one hectare (perhaps 1/10th or 1/20th ha.). Thus the actual growing area was unencumbered by non-productive `waste area' -- dikes, paths, house-yard and garden area, pond, hedgerows, turning area, etc. -- all of which are usually included in an estimate of farm size. Trial yields are "scaled-up" and harvest results are given in tons/ha -- to one decimal point, or a rounding factor of 2+ cavans. While there was probably no intent to deceive, this highlights that a researcher's data needs for measuring productivity increases do not coincide with an extension agent's. For further details, see Vernon Ross "The `Masagana 99' Story -- Cooperative Filipino and IRRI Project," a paper presented at FAO, Kuala Lumpur (Malaysia) Seminar, on December 8-13, 1974.

[10]Rice farming was essentially a small farm operation -- usually of less than 5 hectares per farm.

[11]As early as July, 1971, Roberto Fronda, the Executive Director of NFAC, had requested technical assistance from USAID to assist in the design of an information system to meet the Council's operational management needs. A preliminary survey revealed that the existing "Monthly Progress Report" contained many weaknesses which resulted in it being an incomplete historical summary, rather than an action document for management control and future programming. See Kenneth F. Smith & Reine P. Villarosa, *"The NFAC Monthly Progress Report on the Food Production Program,"* (Manila, Philippines: U.S. Agency for International Development, August 1971).

[12]*Ibid.*

[13]Declared by President Marcos on 21 September 1972 -- in the face of a rapidly escalating social crisis which included numerous incidents of civil disorder, open rebellion, insurgency, sabotage bombings of public facilities in Manila and elsewhere, and widespread killings, banditry and terrorism throughout the countryside.

[14]Based on numerous individual "Farm Plan and Budget" documents, prepared by an extension worker jointly with the farmers, rather than a bank official.

[15]Rural Banks were independent, largely family-owned corporations which traditionally had had little or nothing to offer the rural peasant farming populace.

[16]"Masagana 99 -- The Bloodless Revolution," Speech of President Ferdinand E. Marcos, during the awarding ceremonies of Masagana 99, Phases I-II, and Launching of Phase III, May 22, 1974.

[17]And available evidence points to the fact that the 1985 imports were not really necessary, but were politically motivated -- to insure an abundance of cheap rice during a critical election campaign period. (Note: 1983 was another disastrous production year because of a series of natural calamities, but the nation was sustained by carry-over stocks from prior years.)

[18]Martin Landau & Eva Eagle, *On the Concept of Decentralization* (Berkeley, California: University of California Institute of International Studies, 1981), pp. 42-44.

[19]Primarily the Bureau of Plant Industry (BPI) and the Bureau of Agricultural Extension (BAEx).

[20]"Masagana 99 -- A Program of National Survival," Speech by President Ferdinand E. Marcos, during the Launching ceremony of Masagana 99, May 21, 1973.

[21]i.e. roll-over re-financing. For awhile, a Crop Insurance scheme was also discussed, but after some study was abandoned as infeasible -- too technically complex and costly -- to implement in the Philippine context at that time.

[22]The amount of the write-offs must also be figured into the bank's interest fees and other charges in order to maintain profitability. In effect, a large write off necessitates a higher aggregate "break-even" repayment rate.

[23]Production Technicians were paid incentives for working with the banks to make and collect loans. They viewed these two functions separately however. Loan making -- through preparation of the Farm Plan and Budget -- was considered an integral part of the Production Technician's extension services for which he/she had received training. Collection, on the other hand, was viewed as an irksome task which put the technician in a conflict role with the farmer, rather than the supportive role which both agricultural extension training and Philippine cultural tendencies favored. The Production Technicians had to be bonded in order to perform collection agent duties.

They also were limited -- for personal safety/security reasons -- from holding more than 3,000 pesos at a time. With farmers borrowing and repaying approximately 1,000 pesos each, this limitation necessitated much commuting by the technician on a motorcycyle, or other unsecured vehicle to and from the bank, significantly reducing extension reaching with targetted farmers. Thus, many technicians simply neglected the loan aspect of the job (particularly the loan collections) as "the Banker's problem. In short, it was better (i.e. much easier, and more profitable) for the technician to give than to receive, and the steady monthly salary incentive was more reliable than the haphazard loan "commission." See Arturo R. Tanco and Reeshon Feuer, "Masagana 99 Rice Program Brings Self-Sufficiency to the Philippines" a paper prepared for the International Rice Commission in Sierra Leone, on November 1976.

[24]The Barangay Captain (i.e. a principal elected local official) of one area was amongst those arrested for wilful failure to repay - with no acceptably justifiable reason.

[25]Even the "*Selda*", or "*Damayan*" (compact farm) -- an innovative mutual insurance scheme built on traditional principles and devised to protect both the farmer and the bank against the consequences of non-payment -- backfired. In a selda several farmers mutually co-signed a group loan and received their propotional share, but each was liable for (and guaranteed payment of) the whole amount. The concept underlying the selda was that a recalictrant individual would be pressured to repay by his peers, while in the case of genuine difficulty, the cooperative *bayanihan* spirit would provide neighborly support to individuals in distress -- even to the extent of assisting to work the farm until the afflicted family was able to repay their debt. The reality did not square with the theory, however. As long as everyone was able and willing to pay, the *selda* system worked well, and it also reduced the paperwork volume (and burden) of individual loans. Unfortunately, in practice the *selda* was not as coercive nor the *bayanihan* spirit as prevalent as presumed. When one individual in the *selda* balked (or was unable to pay), the lack of ressponsibility of a leaderless committee was manifested by the other *selda* members, and in many instances no-one paid, ultimately leading to the demise of the *selda* system.

[26]From the start, there were Masagana farmers who participated in the program without obtaining credit from it. However, each individual participant was required to have the wherewithal to purchase the expensive inputs which the program necessitated, i.e. HYV seed, fertilizers, weedicides and pesticides. The amount of non-collateral credit that a farmer could obtain under the program was determined from a "Farm Plan and Budget," prepared by the extension agent in consulation with the farmer. Those farmers who already had adequate resources, or preferred alternate sources of financing were enrolled as "non-credit" participants.

[27]Irving Spergel, *Evaluative Research; Strategies and Methods* (Pittsburgh, Philadelphia: American Institutes for Research, 1970), p. 108.

[28]Following compilation of each month's reports, the NFAC/MIS staff targetted "exceptional" provinces to visit for field follow-up assistance, and to conduct data verification surveys. While many provinces were visited regularly for consultation, because of staff and time limitations surveys to verify reported yields were conducted in only a few provinces. Nevertheless, both the field experience and the survey findings were useful to NFAC staff to gain and maintain an appreciation for the field working environment, the difficulties inherent in obtaining program production data, and to better assess the quality of the data received. These surveys were approximately one week "quick-and-dirty" on-farm visits, observations and interviews of Masagana participants, conducted by teams of specially-trained NFAC/BAECON MIS Division staff, and NFAC Program Evaluation staff. The respondents were selected by stratified random sampling methods; a standardized questionnaire was used, and the interviews were selectively back-checked by a roving NFAC MIS Division supervisor. The preliminary findings from these surveys were presented to the Provincial Governor and the Provincial PPO at the conclusion of the field visit, and copies of the final report were usually transmitted to them (as well as key personnel in the central offices of NFAC and the Department of Agriculture) within two weeks.

[29]Completely independent of NFAC's surveys and the Masagana Program, the Special Studies Division (SSD) in the Planning Service of the Department of Agriculture conducted an annual,

randomly-drawn, survey to present a national picture of all major rice growing areas. The respondents included approximately one thousand (1,000) Masagana farmers-participants and five hundred (500) farmer non-Masagana participants, as well as selected production technicians and representatives of credit agencies. These surveys were extensive questionnaires which covered many different aspects of farming beyond yields, such as marketing and farmers attitudes.

[30]Under the direction of Father Frank Lynch, S.J., the Social Science Research Unit (SSRU) conducted a number of incisive studies or rural development. One such study in October 1973 -- which interviewed 600 rice farmers in Camarines Sur -- concluded that while irrigated land was indeed more productive than rainfed, the yield differentials between Masagana participants and non-participants was more significant for the rainfed areas.

[31]Jesus C. Alix, "The Impact of the Masagana 99 Program on Small Farmer Production and Income in the Philippines," a paper delivered at the FAO Workshop on Price and Income Support, and their Impact on the Small Farmer in Bangkok, Thailand, on January 22-27, 1979. (Note: Alix's yield data was reported in "Metric Tons per Hectare". I have converted this to 44 kilo Cavans, to facilitate comparison and interpretation.)

[32]Former Associate Director of the U.S. Peace Corps in the Philippines; Consultant for Management Audit to the Philippine Ministry of Agriculture, and subsequently Assistant to the Leader of a USAID-sponsored Kansas State University contract team "Integrated Agricultural Production & Marketing Project". Gary E. Lewis, "The Extension-Outreach Component of the Masagana 99 Rice Production Program in the Philippines" (Laurence, University, California: Unpublished Ph.D. Dissertation, Laurence University, California, March 1980.)

[33]Elsa P. Mateo-Bayani, "A Study of the Masagana 99 Rice Production Program in the Philippines" (Australian National University, Canberra, Australia: Unpublished Master of Agricultural Development Economics Dissertation, May 1977.)

[34]The principal source of BAECON data for rice production was a quarterly "Integrated Agricultural Survey" (IAS). The IAS was initiated in the crop year 1968/69, and improved data collection techniques were incorporated into the system during the 1969/70 crop year. The IAS is purposive, nationwide, sampling of approximately 100,000 farmers who are permanent respondents, selected in 1970 on a stratified random basis. Rice farmers are a subset of all farmers, stratified by type -- Irrigated, Rainfed and Upland, however Masagana participants were not separately identified in this stratification. Surveys are conducted by teams at the municipality level, but the data are aggregated centrally, and are not considered meaningful below a regional level.

[35]Compounding the difficulty of (and contributing to the confusion in) analysis is that the standard unit of measure -- the *Cavan* -- for paddy rice *(palay)* was also changed during the Program from 44 kilos to 50 kilos.

[36]This was particularly difficult for the Secretary of Agriculture in estimating availability of rice from harvest, private and public rice stocks, consumption rates, as well as for making import/export recommendations. See for example Kenneth F. Smith "Philippine Rice Production for Crop Year, July 74 - June 75", Memorandum to Mr. Thomas C. Niblock, Director, USAID/Manila, November 29, 1974, p. 9 -- in which the quality of available data is assessed and the conclusion (from the data) is that "the Philippines could have either a surplus of over 9 million cavans, or a deficit of over 12 million. This represents almost a +/- 10% range for error, which is much too large for comfort."

[37]@ 44 kilos per cavan.

[38]"A Study on the Masagana 99 Experience" (San Simon, Pampanga: Assumpta Technical High School), undated. Provided to me by Sister Milagros, October 1977.

[39]Given a population of 41.297 million, per capital consumption of *bigas* at 96 kgs/annum, and a 66% recovery rate from milled palay.

[40]i.e. ((50/36.3) x 100) - 100 = 37.74 percent.

[41]i.e. ((50/32.8) x 100) - 100 = 52.44 percent.

[42]"*Masama na 99*" -- "It's a bad 99"; -- a contemporary Tagalog pun for a Masagana participant's crop failure.

[43]Kenneth F. Smith, "*Palay Productivity and Profitability in Iloilo 1971-72: A Comparative Analysis*" (USAID/Manila: December 1972). Also Jessie Divingracia and Kenneth F. Smith "*Palay Production and Profitability for Small Scale Farmers*", (Iloilo, 1975). *An Economic Analysis of the "Masagana 99" Technology*", (Department of Agriculture, Quezon City, Philippines: June 1976).

[44]There are several categories of farmers -- i.e. Owners, Leaseholders, Share-Tenants -- whose profitability is a function of their mortgaging/renting/sharing arrangements. The study examines several of these. The finding are too broad-ranging for the purposes of this study; but the essential point is that the farmer's goals are not necessarily synonymous with national objectives of increased yields. At various thresholds, the additional cost and effort may not be considered worthwhile. "Complacency economics" -- i.e. the relative desirability of "resting" after a "satisfactory" level of income has been attained, rather than striving to achieve higher production and productivity -- is a significant factor in the equation.

[45]Kenneth F. Smith, "Palay Productivity and Profitability in Iloilo" *op.cit.*, Also Divinagracia and Smith *op.cit.*,and Department of Agriculture's Economic Analysis of "Masagana 99". *op.cit.*

[46]At the time the Masagana program was being formulated in the Philippines, cigarette advertisements were promoting the concept of a long cigarette -- of 100 millimeters. (Indeed, one company was even pushing their product as superior because it was a "silly millimeter longer.") There was also some discussion about rounding-up the Masagana target to 100 or even 101 cavans, to capitalize on this popular theme. . But "99" won out because it was "authentic", it sounded "catchy", and "Ninety-nine" was considered sufficiently high as to attract the interest of even the most recalcitrant farmer -- in effect, more than double prevailing yields. Norman Borlaug, a pioneer in developing high yielding grain varieties, had emphasized in his earlier research that a marginal increase would be of little interest to farmers -- one would have to show a significant improvement in productivity to persuade a small farmer to change his farming behaviour.

[47]i.e. ((99/32.8 x 100) - 100) = 201.829

[48]Ferdinand E. Marcos, "Masagana 99, The Bloodless Revolution," Speech at the Awards Ceremony of Masagana 99 Program, May 5, 1974.

[49]*Ningas Kugon, or Ningas Cogon* -- " a flash fire in dry grass" -- is somewhat akin to the "bandwagon effect". It refers to a generally-acknowledged Filipino characteristic whereby a new idea, fashion, practice or concept initially attracts widespread, enthusiastic, support and emulation for a brief period of time; only to be discarded and/or entirely neglected in the longer term. Chester L. Hunt, Agaton P. Pal, et. al, *Sociology in the Philippine Setting*, (Quezon City, Philippines: Alemar-Phoenix Publishing House, Inc., 1973), p. 62.

[50]It is important to recognize that "intensity of supervision" is not the only variable at work in increasing productivity. Thus a direct cause-effect correlation that "x" amount of supervision will cause "y" amount of productivity is not expected. Nevertheless production technician supervision was considered one of the key variables -- other things being equal -- that would make the difference; consequently, whether it was indeed significant is what was examined.

[51]An appropriate analogy might be the "sinner" who once believes, is "saved", regardless of further contact with the priest.

[52]Arturo de Guzman, "The Masagana 99 Message and its Presentation on Radio," Presentation to the First National Seminar-Workshop on Masagana 99 and Radio as Partners in

Rural Development, University of the Philippines at Los Baños Department of Agricultural Communication, December 10-13, 1973.

[53]i.e. "New method" (of farming -- High Technology).

[54]Jill Merrick, *Masagana 99: Promoting a Miracle* (Washington, D.C.: Academy for Educational Development, April 1981), pp. 9-10.

[55]Frank R. Endaya, *Farm Casting,* (Manila, Philippines: Bureau of Agricultural Extension, Handyman's Guide, July 1978).

[56]J.D. Drilon, Jr., "Masagana 99 and Rice Technology Transfer," Presentation to the First National Seminar-Workshop on Masagana 99 and Radio as Partners in Rural Development, University of the Philippines at Los Baños, Department of Agricultural Communications, December 10-13, 1973.

[57]Written by Gene Generoso, a former pop composer/singer of the "Electromaniacs"; with music by Emil Mijares, one of the Philippines top musical arrangers.

[58]Ironically, in addition to President Marcos's Masagana 99 program, the First Lady, Imelda Romualdez-Marcos imperiously initiated a separate project -- *Palayan Ng Bayan* (Rice for the Nation) -- encouraging farmers to convert existing farmland to (or clear new land for) rice production. The basis for her plan was simple -- the anticipated productivity increases from new land (for example -- 36 (traditional) to 80 cav/ha (M-99) were higher than the marginal increases that might be obtained from existing land. Although this apparent increase was obvious to *Palayan's* supporters, the economics of the situation -- i.e. the enormous start-up costs of development in order to obtain this new farm production, and the cost/benefit of a cavan of "new land" palay as compared to the costs and benefits of wresting marginal increases from existing farms -- were not as apparent. NFAC and the Department of Agriculture raised these economic issue, plus the additional concern that more farmers and more hectarage would create further strain on available resources (particularly production technicians and fertilizers) as well as create future supply/demand and price problems for the farmers marketing the palay. But despite all efforts to dissuade her, "Ma'am" was adamant and *Palayan Ng Bayan* was launched. Despite the heavy investment costs which must have been incurred (beyond the scope of this study) the new hectarage provided the margin for self-sufficiency. The irony -- as the marginal analysis indicates -- is that without Imelda Marcos' program, the nation would not have attained self-sufficiency. Thus Masagana would have been an "almost-successful" Program, and would not have received such recognition for success. It can only be speculated whether Masagana (or existing traditional) farming would have attained better results (i.e. closer to the 99 ca/ha potential) had this new competitive Program not entered the lists. Such speculation is beyond the scope of this study.