Sida Evaluation 97/19

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Sida-supported satellite imagery and computerized cadastral support systems in the Philippines

Karlis Goppers

Department for Infrastructure and Economic Cooperation

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MAPPING FOR ECONOMIC DEVELOPMENT

An Evaluation of Sida-supported Satellite Imagery and Computerized Cadastral Support Systems in the Philippines

EXECUTIVE SUMMARY

Sweden's aid to the Philippines

Although not a program country of Swedish aid, the Philippines has since the late 1980s received a total of over 600 MSEK in Swedish aid grants. Apart from a 325 MSEK grant element of a concessional credit, the bulk of the aid has been in the form of *contract-financed technical assistance* : 211 MSEK for 56 projects mainly in energy, environment and physical planning. Twenty MSEK have gone to five projects in support of *democratization,* 16 MSEK to 33 different *emergency relief* projects, and 31 MSEK to 10 NGO-projects, In addition, Sweden has financed cooperation for business and trade, and trained about 250 Phillipinos in seminars and courses.

The evaluated projects

The objective of the *Cadastral Support to Land Reform* project, which has been going on in three phases since 1991 at a total cost of 17,3 MSEK, was to provide systems support - based on the latest computerized geographical information systems (GIS,LIS, APC etc.) - for the country's *Comprehensive Agrarian Reform Program, CARP.* Project outputs also provide essential elements for land valuation and taxation, and are vital inputs to resource managers, planners and policy makers.

The objective of the *Satellite Mapping for Natural Resources Management* project, which likewise has been going on in three phases - from 1987 at a total cost of 19,4 MSEK, was to provide the country 's agencies responsible for natural resource management and environmental protection with satellite imagery data to facilitate their efforts of environmental protection and enhancement.

Economic development

After almost two decades of mis-managed economy and political crisis the Philippines has in recent years moved to liberalize and stabilize its economy, and can now start to reap the fruits of successful structural adjustment and improved macroeconomic management. Progress towards poverty alleviation has been slow however. More than a third of Philippine households still have incomes below the official poverty line. There are very sharp geographical differences. In rural areas the poverty incidence is between one half and two thirds of all households; among all farming families in the country two thirds were considered poor in 1988. Incomes of the *poorest* group have been improved, leading to a 40 % decrease in the income gap between the poor and the poverty line. This implies that the country's poverty is "shallow," id est a

large part of the poor are near the poverty line.

Land reform

The concentration of land-holdings is not much different in the Philippines than in other Asian economies. Even so, land reform is seen as perhaps the country's most burning *political* issue, and the implementation of an effective land reform is by many believed to be a necessary condition for avoiding social and political unrest in the country. The current program is expected to benefit three million families, or almost one third of the country's population.

Following very slow progress during the initial years, implementation of land redistribution has picked up dramatically since 1994. Most available public lands have now been redistributed, as well as most private lands above 25 ha. All big land-owners in the Philippines have today already lost their lands, except for the lands that were exempted because they were deemed to be successful commercial operations like e.g sugar plantanations. Redistribution of privately owned lands lags behing that of Government owned lands.

In spite of important achievements during the last few years the land reform program is still well behind schedule. Many of the the bottlenecks to implementation seem to persist, among them: loopholes in the law, institutional bottlenecks, absence of accurate data on land ownership and tenurial relations, limitations of financial resources, and lack of surveying capacity.

Although land reform can potentially play an important economic and political role, it is not a panacea for poverty. As the experience from other countries shows, successful reform must include the provision of rural infrastructure and technical support. Simply redistributing land has been found to have little effect on earnings in rural areas or on aggregate poverty and inequality. Instead, increasing the access of the worst off regions to paved roads and electricity could reduce poverty significantly by improving productivity and earnings. Most of the funds allocated for CARP today are used up to pay the land-owners for the nationalized lands, leaving little for needed infrastructure.

If the objective is to *achieve maximum poverty alleviation among the rural poor*, CARP should be modified by (1) limiting land redistribution to areas where need for it is perceived to be the greatest, thereby (2) freeing more funds for infrastructure and agricultural services, (3) desisting from nationalizing lands smaller than 25 ha, since it would be much more complicated and costly to survey and legally process many small and scattered plots of land than bigger ones, (4) making the land reform program more *market oriented*, and thereby more decentralized, and (5) introduce a *land tax* as this would encourage many land-owners to sell voluntarily or use their land more efficiently.

If, on the other hand, one believes that the *political* dimension of land reform is all important, namely that the redistribution of land in itself is a necessary condition to preserve social and political peace in the country, then

the Government is limited in its options to cut down on the scope of the present universal land reform program. It should be noted that possible modifications in CARP, as discussed here, would have no implication for the cadastral support systems project, since the need for systematic cadastral information systems would not be changed.

Environment

Philippine environment today suffers from over-exploitation of natural resources, deforestation, severe soil erosion, and pollution, and the problems are likely to become more severe because of a rapidly growing population and increasing industrialization and urbanization. *Deforestation* continues at an estimated annual rate of 100,000 ha. Coastal resources are threatened by over-exploitation and the widespread use of destructive fishing methods. An estimated 30 % of the total *coral reef* area in the country has already been destroyed and another 30 % is in poor condition. One third of the country´s 400 major rivers are heavily polluted.

Public expenditures on natural resource management and environmental protection have grown by almost 20 % per year over the last five years. But despite significant progress achieved, several institutional and resource allocation issues remain to be addressed. Enforcement of existing environmental regulations remain difficult, primaily reflecting inadeaqute institutional and financial capacity.

The evaluation

The main reason for this evaluation was to prepare for Sweden´s new aid strategy for the Philippines. The evaluation, based on a two week visit to the Philippines in December 1996, of which one week in Mindanao island, analyzes achievements and effects of the two projects at three different levels:
- the project level: Have *output* targets been achieved? Has replication and/or integration with similar systems of other agencies been achieved? How has the contractor performed?
- the program level: What has been the *effect* of the project?
(1) In the case of the Cadastral support service project: What is its effect on the *Comprehensive Agrarian Reform Program?*
(2) In the case of the Satellite maping project: What is its effect on the environmental management and enhancement work performed by DENR?
- the national level: What is the *impact* on the national level?
(1) Has CARP been a successful program? Is it an effective means of achieving overall national goals? Is it achieving poverty alleviation for the country´s rural poor?
(2) Has the country´s management of natural resources and the environmental situation been enhanced?

Less emphasis is laid on the *satellite mapping project* as very little new activity has taken place there since the project was evaluated in 1992. On the other hand special attention is devoted to the questions of *compatibility* and *replication* of systems as there are today about 40 different GIS-systems

in operation in many different agencies. For each of the projects a goal hierarchy based on logical framework analysis is constructed. Achieved results are assessed against planned targets, and outcomes discussed with respect to the following aspects: *Social and economic equality/ Poverty orientation; Economic growth; Democratization; Independence; Environment; Gender; and Sustainability/relevance.*

Availability of data was good in the cadastral project, especially at project level, while in the Satellite mapping project, availability was more limited on all levels.

FINDINGS:

The cadastral support systems project:

The project only states *equality* as an overall objective, but other objectives, are also relevant and should be added as the successful implementation of a land reform program can be expected to have an impact also on *economic growth , management of natural resources and environment* as, as well as *enhancment of democracy.*

All the inputs and activities as foreseen in the project documentation have been duly implemented. Only a few minor points need to be criticized or discussed, e g the possibility of having a consultant present in permanent residency, longer visits by the consultants, and who should be responsible for project procurement - the project Director or the consultant. Documentation regarding the project is complete, and usually presented clearly and pedagogically. All the systems, as concerns both hardware and software, installed in the DAR central office, are working smoothly, and the staff running them are proficient enough to be able to train other staff of the provincial and municipal offices in running the same. DAR central office today posesses a functioning computerized cadastral support system - consisting of GPS, APC, LIS and GIS - which is able to capture, encode, elaborate, process, present and print out text and graphic information, as well as maps in different scales.

Training has been effective, but the total number of staff trained to operate the various systems is relatively small, making the system vulnerable to loss of manpower. Almost all the staff have a university level degree, and would therefore seem to be overqualified for their tasks. While this is obviously good for the project at present, it raises the question whether this staff will stay on their jobs.

When it comes to *replicating this system* to the designated DAR regional, provincial and municipal offices, efforts are under way, but there is still a way to go before a computerized system can be operational. They are yet to receive the necessary computers and printers.The objective of *integrating the cadastral support system with existing systems at other CARP-implementing agencies* has been addressed, but it is not clear exactly what was intended by the donor. Depending on *how* the ambition is defined we find that the project has failed or succeeded in this task. The time which can usefully be spent on coordination with other agencies is limited, but it is clear that the

issues of coordination, compatability and integration must become much more important in subsequent stages of this project.

Only a limited initiative has been taken by the project to demonstrate and spread, or ensure compatibility with other *non*-CARP agencies. This is not required by the project's plan of operation, but the contention of this evaluation is that this *should* also be an objective, because many other agencies are - or want to be - involved in similar GIS systems.

There seems to be no question that the *outputs* produced by the CSS project noticably affects CARP implementation. There are a number of CARP components which directly rely on computerized information support systems to be supplied by the CSS. The project's objective of facilitating the implementation of CARP is thus achieved. A direct bottleneck for the speedy execution of the targeted land redistributions are the insufficient resources and capacity of DAR and of DENR to carry out surveying and cadastral mapping work, without which no land aquisition nor land distribution can legally take place.

Given the trend towards standardization of terms, character, as well as costs in the increasingly active international market for consultancy services in cadastral mapping techniques, procurement has grown more business-like in recent years. This seems to be true even for tied aid funds. In an efficiently run project like the one here, we can therefore conclude that the results have been achieved in a cost effective way.

The land reform program is important for its potential to achieve *social and political peace* in the country. If this potential is realized we can also claim that it contributes significantly to the country's long run development

It is evident that a program which takes land from the rich in order to give to the poor will fulfill the objective of *decreasing inequality.* If managed properly it is also likely to contribute to *poverty alleviation.*. This holds even though the rich are paid for the aquisitioned land, and even though the poor are paying (a subsideized price) for received land.

When it comes to the objective of promoting *economic growth* there is a more mixed picture. It depends on the situation in each particular case, mainly on the type of land in question: How was the land used before and how is it used after the the nationalization and redistribution? A relatively large share of the lands distributed so far have been Government owned lands, part of which were previously idle or used only little. In these cases we can expect agricultural output to be enhanced by the land reform. On the other hand, there are nationalized lands, which were previously used for commercially successful large scale plantation type production, and where this land after the redistribution will be tilled by many small independent farmers/ settlers, some of whom have little or no experience from agriculture, least of all from commercial type farming. In these cases we must assume that the country's economic growth (at least in the short run) will be hampered by the land reform.

A recent survey of CARP beneficiaries revealed that about 75 %

perceived that their lives improved after being CARP beneficiaries. 77 % of them attributed this to CARP. Of these 89 % said that the improvement had been primarily due to the abolition of share tenancy, while the rest thought it was due mainly to the provision of support services under CARP. Income data showed that households derive more income from non-farm sources (55%) than from farm work (38%). The incomes of the ARB households were found to be significantly lower than the national average. While the 1.4 million ARB households constitute about 11 % of the the country´s total households, their income was only 5 % of the nation´s total income. The same proportions were found for household expenditures.

The objective *enhancing democratic development,* we can expect to be served if masses of former landless people become self-employed farmers, and thereby presumably get a bigger stake, as well as a bigger say in local government

Satellite mapping of natural resources project:

The project activities were implemented efficiently and according to plan, and the characterization of NAMRIA as "a competent, modern and fully equipped work place for remote sensing", which was made by an evaluation carried out in 1992, would seem to be applicable also today. According to interviewed NAMRIA´s officers the foundation was laid during the first phase of the project, and since then a partial and balanced up-grading of needed soft-wares and some hardware has been undertaken.

All the *output targets,* given the agreed down-sizing of the project scope, were achieved without any problems. A problem remaining from the earlier phases of the project is that NAMRIA is not allowed to charge its clients the full actual cost of the maps that it supplies. This means not only that its clients enjoy a substantial hidden state subsidy, but also that NAMRIA is deprived of an incentive to spread its maps and services, thus preventing a sound market situation to develop

The international price of satellite data is very standardized, so in the competition between suppliers it is the quality and price of the surrounding services offered which are decisive. DENR sees itself as a cost conscious procurer of services. Even if the aid funds in question had been untied they would for this procurement have chosen Satellitbild.

Regarding the *effects* of the project we can conclude that the project has had its desired *effects* regarding all the targets listed in the projects goal hierarchy. It has facilitated *the construction of realistic plans for the country´s natural resources management and exploitation,* and *"legislation and other measures to protect and enhance the environment."* It has also facilitated the *"planning of evacuation routes for the local population".*

Given the many applications of the project results in legislation and other initiatives aiming at improving both natural resources mangement in general and environmental protection and enhancenment in particular, we can assume that the project has in deed had a beneficial impact in *protecting and enhancing the environment.* The clearest example of this is perhaps the legislation banning certain types of logging in order to protect the country´s

virgin forests, which is reported to have come about as a direct result of the satellite imagery supplied by the project.

By virtue of the many uses that have been made of the satellite imagery we can likewise assume that there has been a beneficial impact on the country´s ability to derive higher *long run economic benefts* from its exploitation of the nation´s natural resources.

NAMRIA having built its own in-house capacity to interpret and process received satellite imagery, the project should have a good chance of becoming *self-sustainable.*

Coordination

GIS has been used in the Philippines from 1970, and since then perhaps as many as 40 different agencies have introduced its own GIS data base. But there still does not exist a national system that interlinks geo-information available in different government departments and private offices. There are plenty of GIS to choose from, but a standard data set from which all these systems can relate, interlink and share data is still unavailable. Many agencies today produce maps for their different individual needs choosing different scales and projections. Little or no coordination has taken place and there is today a proliferation of different systems and coverages of similar data. This seems to be true not least in the area of land data.

Some initiatives have been taken by the Government to address the problem, the most tangible being the creation of the *Inter agency Task Force on Geographical Information*, so far however without any forceful implementation. The donors seem to have mainly given lip service to this problem. One of the reasons why the Task force has not had more influence so far may well be the fact that no donor has included this Task Force in its cooperation.

Sweden´s future aid

The two projects evaluated here both seem to fulfill most of the criteria posed by Sweden´s new aid strategy visavis the Philippines.They are aimed at benefitting environmental protection and poverty alleviation respectively. They are both geared towards the transfer of particular Swedish experience and knowledge, which can be put to good use in the Philippines, and they are implemented by way of contract financed technical assistance.

Given that these projects have been evaluated and found to have performed well so far, they would both therefore seem to be obvious candidates for continued Swedish financing.The proposals submitted to Sida for additional phases of these two projects both emphasize the transfer of knowledge aspect, rather than the transfer of resources. Both of the projects can also be said to belong to the category "cathalytic" or strategic in the sense that they represent areas where the donor can, in the present stage of Philippine economic development, "make a difference" with its aid program.

Recommendations

The question of ensuring coordination and avoiding future incompatibilities between different geographic systems, installed and developed in various

agencies, should be made a much more central issue in future projects, or new phases of existing projects. If the donor Sida has any intention of raising its profile in the development dialogue with the Philippine Government this issue would seem to be a very suitable one on which to engage in a dialogue.

Future projects, or new phases of existing projects, in the area of computerized geographical systems should cooperate with, or possibly give direct or indirect suport to, the coordinating mechanisms that exist, e.g. the *Inter Agency Task Force on Geographical Information..*

Also, the question of coordination in the field of geographical information systems should be lifted up to a higher political level, perhaps ministerial, to become effective.

Sida should strive to arrive at a solution regarding the cases of incompatibilities, that were noted by the evaluation, between BITS versus "old" SIDA´s development cooperation cultures.

Lessons learned

For land reform programs to be successful (in the sense that they will benefit the landless poor) the redistribution of lands must be accompanied by large investments in infrastructure and agricultural extension services for the new land-owners. This is the conclusion that can be made on the basis not only of the many years of land reform efforts in the Philippines, but also based on the experience from many other countries in similar situations. In the effort to improve the living conditions of the rural poor, land reform can be seen as a necessary, but not a sufficient condition.

In a country like the Philippines it is possible to successfully implement an advanced computerized information system, which for its functioning depends on the availability of many skilled local personnel, *but* one must allow ample time for the new computerized systems and routines to "sink in", before the functions can become operational on a national level.

The revelation of the satellite imagery that the country´s virgin forests were threatened goes to show that also a relatively small high technology project can have a major environmental impact when applied judiciously and implemented successfully.

Even though no actual case of incompatibility of systems occurs in the short run, this evaluation shows the crucial importance of coordination even in the early stages of a project. Often incompatibilities of different systems will manifest themselves only after several years have passed, when information systems have grown too big to be easily changed.

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List of acronyms used

APC	AutoKa PC mapping software
ARB	Agrarian Reform Beneficiary
ARC	Agrarian Reform community
BITS	The Swedish Board for Investment and Technical Support
CARL	Comprehensive Agrarian Reform Law
CARP	Comprehensive Agrarian Reform Program
DAR	Department (=Ministry) of Agrarian Reform
DARCO	DAR Central Office
DARRO	DAR Regional Office
DENR	Department (=Ministry) of Environment and Natural Resources
GIS	Geographic Information System
IATFGI	Inter Agency Task Force on Geographical Information
LBP	Land Bank of the Philippines
LIS	Land Information System
LRA	Land Registration Authority
MARO	Municipal Agrarian Reform Office
NAMRIA	National Mapping and Resource Information Authority
NEDA	National Economic and Development Authority
PARC	Presidential Agrarian Reform Council
PARO	Provincial Agrarian Reform Office
SIDA	Swedish International Development Authority
Sida	Swedish International Development Cooperation Agency (Result of a merger in July 1995 of SIDA, BITS, SwedeCorp, SAREC)

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MAPPING FOR ECONOMIC DEVELOPMENT

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I BACKGROUND/PROGRAM CONTEXT

The relevant background information for this evaluation is the following:
(1) a description of Sweden's overall development aid to the Philippines
(2) a descriptive history of the two Swedish-assisted programs to be evaluated
(3) an account of the country's economic development and poverty situation
(4) a presentation of the agrarian reform and an assessment of its achievements to date, because the main objective of the *Cadastral support project* is to facilitate the agrarian reform
(5) a presentation of the environmental situation and the Government's management of it, because the objective of the *Satellite mapping project* is to facilitate environmental management

1. Sweden's aid to the Philippines

The Philippines has never played a central role in Swedish foreign policy, nor has foreign trade between the two countries been important, even though some increase has occurred in recent years. Sweden's development cooperation with the Philippines started only in the late 1980s primarily with *technical assistance* grants through BITS and *business development* projects through Swedecorp. Mainly for not belonging to the group of poorest developing countries, the Philippines was never one of SIDA's aid recipients, other than as receiver of occasional support through Swedish NGO-projects financed by SIDA.

With the merging of *BITS* and *Swedecorp* into new *Sida* in July of 1995, the Philippines has however become a regular receiver of Swedish aid although not a *program* country. As compared to the core of Sweden's development cooperation, which is mainly with southern Africa and southern Asia, the motive as well as the profile of the Swedish aid to the Philippines was, and still is, to a larger extent conditioned by the interests of the Swedish industry and the capabilities of its resource base.

The broad categories of Swedish assistance can be seen in table 1.

Table 1. Swedish Development Assistance to the Philippines

Type of aid	# of pro-jects	Mil-lion SEK	Years
Contract-financed Technical assistance (KTS)	56	211	1986-
Concessional Credit	1	325 *	1994-1997
Cooperation for business- and trade development			
International courses			
Democratization	5	20	1990-1996
NGOs	10	31	1980-1996
Emergency relief	33	16	1990-1996
Total	105	603	

* 325 msek is the grant element of a total cocessional credit amounting to msek 929

The largest aid amount has been the 325 MSEK grant listed under **concessionary credits.** This was used to finance ABB´s delivery of relay stations for power transmission through underwater cables. The dominating category of development cooperation has however been the contract-financed **technical assistance**, which with its total of 211 MSEK, makes the Philippines one of the largest recipients of Swedish technical assistance. It has covered a large variety of different purposes in different sectors, and has in a number of evaluations been found to be rather successful, not only in achieving stated project objectives but also in promoting Swedish-Phillipino business contacts.

Almost one third of the amount has been in the *energy* field where Sweden´s support has focused on geo-thermal power generation, laying of power cables, and programs to increase efficiency in power distribution. 35 MSEK have been channeled through a World Bank trust fund to finance Swedish consultancy services. Technical assistance in *environment protection* has consisted of a large training program for industry carried out by the Development Bank of the Philippines, the implementation of a community based forestry project, and a program for *satellite mapping of natural resources* , which is one of the programs evaluated in this report.

Assistance in physical planning consists mainly of the program for *cadastral support to land reform* which is the other of the two programs evaluated in this report. In the *transport sector* BITS has supported a 5-year modernization program of the country civil aviation system. The support to industry consisted mainly in training regarding modernization of the paper and pulp industry, apart from the environmental training referred to above, while the technical asssistance in the field of *administration* has focused on support to the country´s decentralization efforts, and specifically to the

enhancement of the capability of local governments to identify needs and to implement desired changes.

Support to business and trade development. From 1992 *SwedeCorp* had a program of assistance to a number of Phillipino business and trade associations, to the furniture industry and to women handicrafts. Later on the support was concentrated to the cooperation between Swedish and Philippino firms. According to an evaluation carried out in 1996 this assistance had not been very successful.

International courses. Since the late 1980s a total of 241 Philippinos - of which 101 women - have participated in various courses arranged by BITS. Most of them attended courses relating to the subjects environmental control, administration and industry.

Democratization and human rights. Sweden's support in the field of democratization and human rights - chaneled mainly through NGOs - has focused on training programs in basic law, democratization programs within the labour unions, and on activities designed to increase awareness of and respect for human rights.

Non-governmental organizations. In addition to the support which has been chaneled through Swedish NGOs to democracy and human rights, about 10 Swedish NGOs have received over 30 MSEK for their programs in the Philippines.

Emergency relief. In as many as 33 instances during the years 1990 through 1996 Sweden has granted a total of 33 MSEK in emergency relief to the Philippines. Most of this support has been in response to disasters caused by typhoons and volcano eruptions.

2. *The Swedish-financed projects to be evaluated*

A: CADASTRAL SUPPORT TO LAND REFORM

The purpose of this project is to establish a computerized geographic based information system which will support and facilitate a speedier implementation of the country's *Comprehensive Agrarian Reform Program* , CARP. Previously a lot of time, effort and funds had to be used in order to acquire and process data on land ownership, which is a necessary prerequisite for carrying out land aquisistions and redistributions. The absence of accurate records on land titles, cadastral maps, lot plans, and boundary surveys hampered the land distribution process. Today modern computerized mapping techniques have developed tools such as geographic informations systems, *GIS* and land information systems *LIS*, which can considerably reduce the time

spent in the production of these data in required form.

Different uses
Land survey data provide essential elements for land valuation and taxation, and are vital inputs to resource managers, planners and policy makers. They will benefit the individual farmer by providing security of land tenure, allowing him to use the land as collateral and thus enable him to get credits, facilitate land transactions, and decrease litigation over land disputes.
It will provide government with a machinery for assessing and levying land tax, facilitate implementation of land reform, facilitate all kinds of public planning, and generally serve as an instrument for public administration.

Project components
The project contains the following parts

(1) Introduction, adaptation, development and operation of the following computerized systems

- Land informations system - LIS

LIS is a tool for planning and development, and for legal, administrative and economic decisions. It consists of a database containing land-related data for a defined area, as well as procedures and techniques for the systematic collection, updating, processing and distribution of the data. In DAR it is used to produce different types of statistics and reports regarding e.g. type of land and category of ownership. It gives each land parcel a unique identification to avoid duplication anywhere in the country.

- Geographical information system - GIS

GIS performs geographical analysis and creates maps. Desk top mapping programs can combine information derived from maps from other databases and produce new maps, just as it can give graphic form to statistical data and present it in map form. It contains many tools and functions that quickly and easily can create reports in the form of maps, single and combined thematic maps, text and tables etc. In DAR it is used for linking APC data with LIS data. Transformation and overlaying of maps/plans for various thematic applications are also posssible.

- Autoka-PC Mapping (APC)

APC is a comprehensive surveying, digital mapping, and information program system with a wide range of applications. Its specialties are: cadastral surveying, production of cadasteral index maps, large scale digital mapping, utlities documentation, and land registration. In DAR it is used to create databases for land use, land capability, and cadastral index maps. Some have been digitized from old map sheets. Accurate cadastral maps of the project areas have been prepared, showing the true location and area of each parcel for direct linkage with data from the LIS.

-Total station and Global Positioning System (GPS) surveying

GPS is the present state of the art tecnique for land surveying work.

(2) Technical training for DAR staff, primarily at the central level but in later phases also for regional and municipal level staff. There has been a continuous on-the-job-training being performed by the visiting Swedish experts. In addition many courses and seminars have been held both in the Philippines and Sweden.

(3) Demonstration and presentation of the computerized systems to other CARP-implementing agencies with a view to replicating the DAR-systems or ensuring their compatibility with systems which might be installed in these other agencies.

(4) Introduction of methodologies, techniques and procedures for *Data capturing* by
- satellite imagery
- aerial photographs for manual interpretation
- cadastral surveys
- digitization of (old) analogue maps
- database organization for technical information

Data capturing is carried out from all available maps, plans, data and other records/information from concerned government and non-government offices. This could be land surveys, taxation records from the assessors office, titles of ownership and mortgage date collected from the register of deeds, etc.

(5) Introduction of methodologies, techniques and procedures for *Data Compilation and Encoding*
- for surveying and mapping using Autoka-PC
- for establishment of databases, and
- for presentation of work outputs

(6) Many other related activities, among them:
- land-use capability and suitability mapping
- soil surveying and mapping
- parcellary sketching
- identification of land occupants
- socio-economic surveys
- data and systems presentations at the baranguay (=village), municipal, provincial and regional levels, or in CARP settlements, or Agricultural Reform Communities, ARCs.

The aim of the DAR program is thus to develop a computerized system for cadastral surveys that will support the implementation of CARP, as well as the planning, research and policy-making surrounding it; A system which is able to produce technical reports with both textual, statistical and graphical informations, and produce small and large scale maps for physical and land

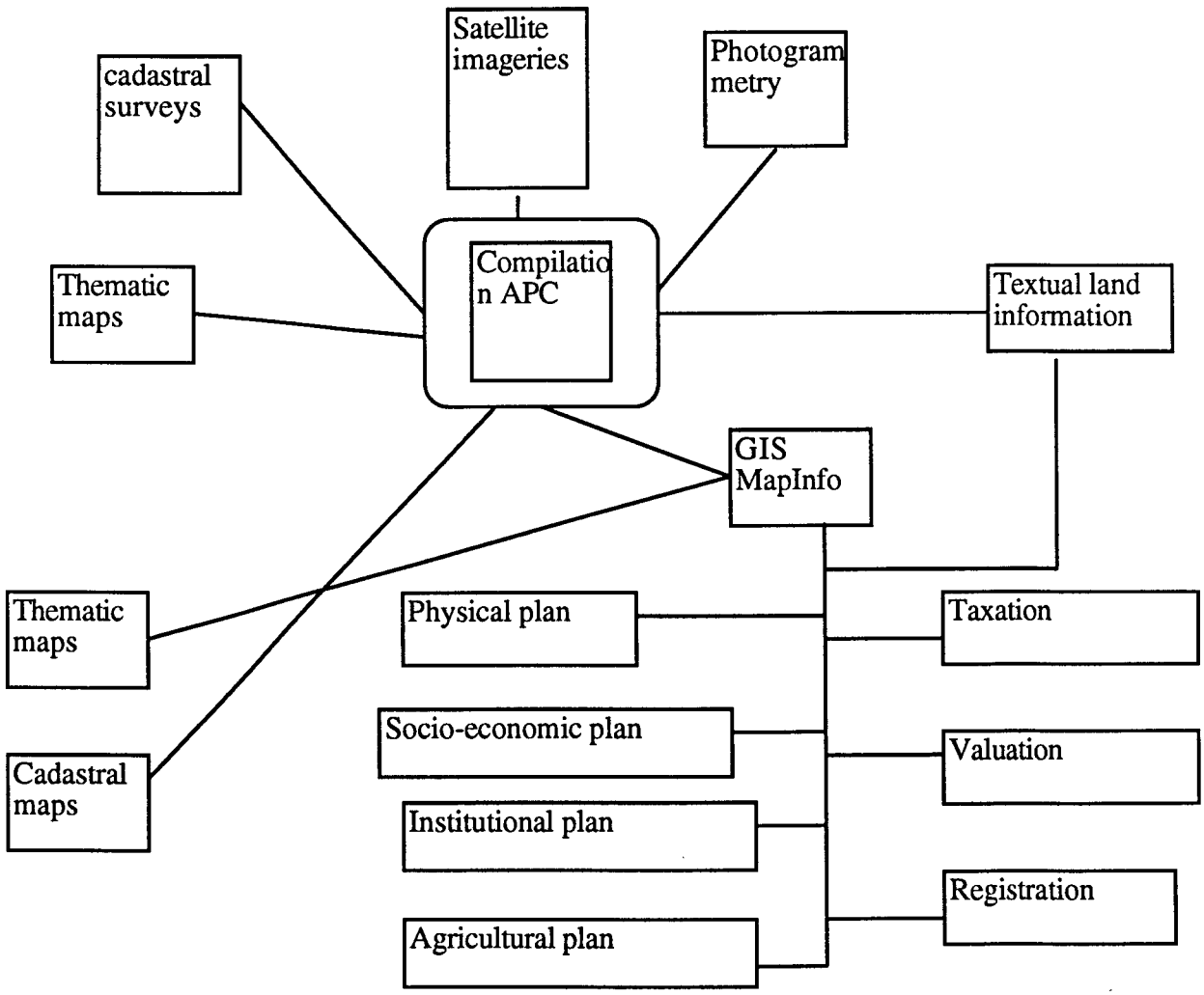
use planning.

Another aim has been to develop a staff with sufficient knowledge and capability to independently handle and further develop the installed system.

After achieving operationality at the DAR headquartes in Manilla, the cadastral support system is now being introduced in two regional sub-divisions of DAR on a pilot basis. The regions are *Agusan del Sur* and *Bukidnon* in Mindanao. Several of the regional staff have undergone training.

Graphically DAR´s computerized cadastral support system for CARP can be shown as in figure 2.

Figure 1: DAR´s computerized cadastral support system for CARP



The Comprehensive Agrarian Reform Program, CARP was started in 1988, and the *DAR cadastral support services project* was started, with BITS support, in 1991. Before that BITS had however also financed a pre-feasibility study carried out by Swedsurvey in 1989.
Due to various delays, caused inter alia by the eruption of volcano Pinatubo, BITS suggested that the project be revised and downscaled, and to be initially implemented only in one pilot area. The project was financed by BITS formally in three phases, I through III, the total grant amounting to some 19 MSEK. The contractor has from the beginning been the Swedish consultancy firm Swedesurvey.

The main purpose of the first two phases, most of which were carried out between june 1993-June 1994, was to identify appropriate techniques and demonstrate how the use of LIS/GIS can enhance the land redistribution work of CARP. Settlements in Regions III and IV in Occidental Mindoro were selected as pilot areas. The latter was a resettlement area for evacuees from the areas affected by the Pinatubo-eruption. The project was followed up by an independent evaluator in the beginning of 1994, resulting in a brief, 7-page "evaluation" report. Except for a few minor points, the project was found to be effective and serving its objectives, and the evaluator recommended continued financing by BITS of a third phase.

The main purpose of the third phase, which is the one evaluated in this report, was to:

- implement the cadastral support system, on a pilot basis, in two regions in Mindanao, and
- demonstrate and seek to integrate the system with similar systems in other CARP-implementing agencies.

Settlements in Bukidnon in Region X and Agusan del Sur in Region XIII in Mindanao island were selected as pilot areas in which to demonstrate the efficiency of using a designed geo-referenced system as a tool to support the acceleration and secured handling of CARP land diostribution.

The dates and the cost of the respective phases of the project can be seen in table 2.

Table 2: Costs of the *Cadastral support to CARP* project, 1000 sek

	Phases I and II Oct 1991-June 1994	Phase III Oct 1994-Sept 1996	Total
Government	2,213	3,334	5,547
BITS/Sida	5,112	6,662	11,774
Total	7,325	9,996	17,321

B: SATELLITE MAPPING OF NATURAL RESOURCES

From 1987 to 1995 three different projects (we will here refer to them in this report as *phases I, II and III)* regarding satellite mapping of natural resources were financed by BITS. They were all projects carried out in cooperation by DENR, NAMRIA and the Swedish Space Corporation, SSC Satellitbild AB.

In **Phase I**, the contract, signed in 1987, was between The World Bank and SSC for 12,15 MSEK. The Phillipine authorities DENR and NAMRIA were non-contract partners. It was complemented with a new contract of an additional msek 2,7 MSEK in March 1987, making BITS´ entire contribution 14,85 MSEK of which 14,847 MSEK was paid out.

The relevant authorities on the government´s side are *DENR,* Departement of Environment and Natural Resources, *NAMRIA,* the National Mapping and Resource Information Authority, and *NEDA,* the National Economic and Development Authority.

DENR is the ministry responsible for the Nation´s environmental policy. It has a vast organization with a central office in Quezon city and regional and provincial offices all over the country. Besides its own line organizations, a large number of central agencies, e.g. NAMRIA, as well as many so called *National Projects* report to the Secretary (=Minister) of DENR.

NAMRIA was created in 1987 to act as the Government´s central mapping agency to attend the needs of the line services of DENR and other government offices with regard to information and research. It was constituted as a merger of the Natural Resources Management Centre, the National Cartography Authority, The Bureau of Coast and Geodetic Survey, and the Land Classification Teams of the Bureau of Forest Development of DENR. NAMRIA today has over 700 employees nation-wide.

NEDA, is responsible for coordination of provincial, regional and national planning and uses DENR and other agency plans as inputs in its work.

The **aim** of the *Satellite mapping of natural resources* project was to provide input *based on SPOT imagery* to the large World Bank study on the country´s natural resources management. The task of this World Bank study, called *Forestry, Fishing, and Agricultural Resources Management (FFARM study),* was to assess the extent of natural resource degradation in the Philippines, establish linkages between degradation and various institutional factors, quantify these impacts in monetary terms, and identify an appropriate set of penalties and incentives to halt and, if possible, reverse the trend towards environmental degradation.

Both the maps and especially the statistics derived from the SPOT imagery are generally used for national and regional planning purposes. On the other hand they seem to be too coarse for use at provincial and local levels. The SSC project was the only one having produced recent data covering the whole country, and its output is therefore especially sought after for national planning purposes. In fact, it was at the time said to be the only case in the world where such a large area, 300,000 square kilometres, had been covered in one project.

A group of twelve Swedish specialists spent two months in the Philippines conducting ground truthing in cooperation with DENR experts. Five ground and twenty air reconnaissance missions were carried out. After that, visual intrpretation of the 190 SPOT scenes took place in Sweden, with the assistance during one month of two of DENR´s staff who had also participated in the ground truthing. The final maps were plotted on a scale of 1:250,000, corresponding to the Phillipine topographic mapping system.

The **outputs** produced by Satellitbild was
- 43 satellite image maps in the scale 1:250,000
- 43 sheets of black and white maps showing the land use according to 22 categories
-43 sheets of black and white maps for the same categories with boundary lines
- 2 digitally classified satellite images showing gland use in different color shades
-190 color transparencies of geometrically corrected satellite images in the scale 1:400,000
- 190 color transparency enlargements of the above to 1:100,000
- 190 CCT-magnetic tapes of the SPOT satellite data
-Overview map of the Philippines in the scale 1:2,000,000

Of the total project cost as much as 50 % was for the satellite images delivered, and only about 30 % for consultancy fees.

Evaluation of phase I

The phase I project was evaluated in September 1992 by an evaluation mission consisting of an expert in satellite mapping and an economist. The team found that satellite mapping had been a very cost efficient method for producing maps, with an average cost per square km of 9 USD. Although it had been impossible to make a cost analysis of the project, the team´s opinion was that *"it remains without doubt that the project has rendered a considerable net benefit to the Philippines."*

It also found that the project had influenced the country´s legislation on natural resources mangement, and had *"generated important down-stream effects on the national and regional natural resource management as well as physical planning at large"*.

One concrete example of a use in legislation of these satellite maps was the disclosure that there is only 1,2 million ha of virgin forest left in the country, not 2 million as was generally believed. This led to a government ban on certain types of logging.

In all 40 clients of NAMRIA in about 50 projects have been using the output derived from the project´s satellite information.

The evaluation, however, also found that the benefits of the project had been reduced by "certain circumstances". *Firstly*, that the *rate of accuracy* of the satellite images, due to some of them being cloud covered, had only been 80 % or even less. To counter this problem the evaluation team suggested that a combination of different technologies - *Landsat* and *SPOT* - could have alternatively been used. In future projects the team found it imperative that accuracy evaluations be included. *Secondly*, the team found that very little training had been provided, but remarks that this had been due to the fact that the project was an input to the World Bank study and *not* a traditional aid project focusing on institution strengthening and capacity building. *Thirdly*, the evaluation noted that NAMRIA is not able able to recover the costs of the products that it is required by law to provide to its clients. This circumstance the team found to work as an effective barrier to the financial autonomy of NAMRIA. *Fourthly*, the team thought that the delivery of satellite images could in future projects be financed by loans, thus leaving more grant funds available for the technical assistance and training part of the project.

Phase II of the project.
On August 20, 1988 a contract was signed between NAMRIA and SSC for the amount of 5.4 MSEK, financed by BITS, for the following puroses:

- the production of *satellite orthophoto base mapping* on the scale of 1:50,000 of CEBU, Bohol and Siquijor islands from SOPOT satellite data
- training in map production, and
- production of a summarizing technical report

Training was to be practiced in the form of close cooperation between personnel from NAMRIA and SSC during the actual production of topographical maps, i.e. on-the-job-training. The total amount of such training to be conductd in Sweden was 45 man-months distributed among 6 trainees.

After two years SSC informed the client that due to adverse weather conditions, SSC had been unable to receive sufficiently cloud-free data of the Philippines, and that it would not be possible to produce the maps acording to the method in the original agreement. This was accepted by NAMRIA, and on July 3, 1991 a new revised agreement of msek 2,9 MSEK was signed. According to this agreement map production originally planned was scaled down drastically, and in consequence also the training - from 45 to 5 man-months.
The implementation of the revised project was as follows:

- Ground truthing was conducted in Siquijor in January 1992 with two

SSC and four NAMRIA personnel

- Training in Sweden was done in februari 1992 for four NAMRIA officers
- 26 sheets of satellite ortphoto maps were delivered
- On-the-job and other type of training was carried out regarding *map revision* using satellite ortophoto

After pre-interpretation of the satellite imagery, those areas and places that neeeded verification, or which had been difficult to pre-interpret, were visited in the field. The field results were drafted on transparent plastic film. The islands were surveyed by vehicle and low-speed air reconnaissance, whereby on-the-job training of NAMRIA personnel formed part of the field work. In addition, training was also carried out in Sweden on *radiometric correction* of satellite imagery during one month for six NAMRIA specialists.

According to our information this phase II of the project has not been evluated. Nor have we, as explained in chapter III below, seen hardly any other documentation regarding this phase. In a six-page long *Summarizing report*, written by Satellitbild, the work corresponding to phase II is summarized thus:

"The project has been fruitful indeed, BITS' emphasis on technology transfer being fulfilled to a high extent. In particular, the satellite image mapping technology has been discussed intensively, both in principle and regarding practical implications. It is anticipated that NAMRIA will benefit extensively from the training and from the products received, utilizing the 26 Satellite Orthphoto maps for map revision, and successfuilly complete the Siquijo Topographic map."

Our own visits to, and interviews with, NAMRIA and DENR have not produced any evidence which would suggest that this characterization, made by Satellitbild, does not reflect the true picture. However, it would obviously be of more value if the same observations and conclusions were made by an independent evaluator.

Finding: Phase II of the *Satellite mapping of natural resources project* has not been evaluated. Nor is apparently any other documentation available from the donor assessing the outcome of this part of the project, financed by BITS, originally amounting to 5,4 MSEK, but revised down to 2,9 MSEK.

Phase III

The satellite imagery produced in 1987/88 for the Worl Bank study did not include the entire Philippine territory. A few islands in the periphery were not covered. In order to make the imagery complete NAMRIA in October 1991 requested BITS to grant a further SEK 1.6 million for completion of the original work, and also for carrying out some other tasks. BITS agreed to this

request and an agreement, referred to as *Appendix B* of the original agreement (i.e that of phase I above) was signed 8 May 1992 for msek 1,619 to finance:

(1) *completion of the 1987/88 World Bank project by the supply of multi-spectral SPOT imagery of*

- the remaining islands
- some other parts which had been cloudy during 1987/88, and
- recently changed parts after the volcanic eruption of Mount Pinatubo

(2) *training and technology transfer in map production in underwater mapping (bathymetry) for the Kalayaan Island group, and supply of panchromatic SPOT imagery for this area.*

This part of Phase III was subsequently excluded from the project.

The present evaluation covers this Phase III project representing a grant of only 1.6 msek.

3. *Poverty and Economic Development in the Philippines*

(The following sections, 3,4 and 5, draw heavily on several recent publications from the World Bank. Quotes are made from the following documents: *Philippines: Public Expenditure Management for Sustained and Equitable Growth, Volumes I and II; September 5, 1995,* and *Philippines: A Strategy to Fight Poverty, November 13, 1995)*

Economic development

After almost two decades of mis-managed economy and political crisis the Philippines has in recent years moved to liberalize and stabilize its economy, and can now start to reap the fruits of successful structural adjustment and improved macro-economic management. The country's growth rate has accelerated to 5,7 % in 1995, exports and investments have grown, the balance-of-payments has improved, the external debt service ratio has fallen, international investors confidence has been restored, and inflation has been contained to a one-digit figure.

Many unprofitable public enterprises have been privatized, quantitative restrictions on foreign trade have been removed and tariffs rationalized. Most restrictions on current account transactions and many on the capital account have been abolished. Foreign investment is now freely allowed in almost all sectors, domestic industries have been deregulated, and fiscal imbalances have been reduced. The improved economic situation can be seen in table 3.

Table 3: *Economic indicators for the Philippines*

	1983-85	1990-92	1995 (est.)
Average real growth of GNP	-4,8	2,3	5,7
Average real growth of Exports	-2,8	3,6	18,9
Inflation	27,8	13,9	8,1
Consolidated public sector balance	-	-2,9	-0,3
Debt service ratio	35,4	21,3	15,4
Gross interntional reserves (months of imports)	1,2	2,7	3,0

Source: Elaborated from the World Bank Country Assistance Strategy, March 1996

Poverty

In spite of the improvement in economic performance over the last decade progress towards poverty alleviation has been slow and the country has been loosing ground relative to its neighbouring countries in East Asia. More than a third of Philippine households still have incomes below the official poverty line. There are very sharp geographical differences. In rural areas the poverty incidence is reported to be between one half and two thirds of the households. Most of the rural poor are engaged in farming, and among all farming families in the country two thirds were considered poor in 1988. The development over the last three decades can be seen in table 4.

Table 4: *Poverty incidence,* in per cent*

	Urban	Rural	Total
1961	51	64	59
1985	37	49	44
1991	31	47	39

* It should be noted that an international comparison shows the Philippine poverty line to be too "generously" calculated. But even if other, more stringent, definitions are applied poverty incidence in the Philippines remains well above 30 %.

Although the urban poverty incidence is much lower than the rural an alarming trend is the proliferation of slums and squatter communities in the towns. Slum dwellings have been found to contain nearly 40 % of the urban populations, implying that also a great number of non-poor have to live in slums.

Finding: More than a third of Philippine households still have incomes below the official poverty line. There are very sharp geographical differences. In rural areas the poverty incidence is reported to be between one half and two thirds of the households.

"Shallow" poverty

Even though a very large share of the population is below the poverty line it must be emphasized that the country has been successful in improving the incomes of the *poorest* group. The gap in incomes between the poor and the poverty line has by the World Bank been calculated to have fallen by 40 % from the 1960s, which means that the "depth" of poverty in the Philippines is today rather small. Or, in other words the income disparity *between* the poor has diminished.

The fact that the poverty is "shallow," id est that a large part of the poor are near the poverty line, has an important impliction for economic policy, namely that economic growth in itself, without any change in the relative income distribution, will be quite effective in decreasing the number of the poor. This insight, according to the World Bank, brings with it the important conclusion that the government´s economic and social incentives should be narrowly focused on the poorest groups rather than being spread thin to all. Comparing rural and urban areas it has been found that the latteer are much closer to the poverty line which means that the urban poor are more likely to be "pulled out of" poverty by general economic growth.

Human development

As regards various human development indicators the country has not performed well after the 1970s. Infant mortality declined only slowly - from 66 per 1000 live births in the late 1970s to 48 in 1948. In rural areas it is 50 % higher than in towns. Although official statistics show the country´s literacy rate to be 94 %, over a quarter of the population is today considered to be *functional illiterates.* The Government´s education budget today allocates large amounts to university level education, while at the same time 27 % of the country´s districts lack an elementary school. One third of all children do not complete primary school. Population growth rate is one of the highest in Asia, and one third of the country´s childeren are said to be mal-nourished.
As regards *gender equality,* incomes and the position of women in the labour market is quite good in relation to most other Asian countries and in deed to many OECD countries.

Distorted economy and unequitable growth

Because of the distorted structure of the economy, the decline in poverty was modest even in the 1960s and 1970s when the economy was growing. By maintaining an artificially high exchange rate, a negative real interest rate and high inflation, the government at the time discriminated against the use of labour, while at the same time subsidizing the use of capital intensive methods of production, and discriminating against agricultural production and against exports. This policy of so called *import substitution* resulted in a growth which was very narrowly based. It was an inward looking strategy which was unstable and suffered constant balance-of-payments crises.

The consistent protectionism which had been mounted in industry was replicated in other sectors of the economy: the banking system, inland shipping a well as in many parts of agriculture.

As for the effects on poverty alleviation the World Bank concluded that: *"A development strategy that relied on government internvention to protect domestic industry, where subsidies, controls and regulations were applied to offset widespread inefficiencies and inequities, itself made growth less efficient, less equitable and more difficult to sustain."*

The exports that were achieved in the 1970s were usually the result of export enclaves in the forms of export processing zones or bonded warehouses, usually with very limited spread effects to the domestic economy. In contrast, the experience of the Philippines in the 1980s, as well as that of many other countries, shows that economic growth in a liberalized economy can have a beneficial effect on the incomes of the poor and on poverty alleviation.

Even in more recent years the Government´s efforts to improve the situation for the poor has so far not been effective. Evaluations carried out, among others, by the World Bank find that programs such as food subsidies, public works, and small scale credits undertaken by the government, have often failed to reach the poor and have therefore been very expensive ways of transferring incomes to the poor. Moreover, when the subsidy transfer *has* reached the poor, they have not led to sustainable income increases.

Income distribution in the Philippines is much less equitable than in most other low and middle income countries in Asia. The so called *Gini-coefficient* of income inequality has not improved over time. Over the past 30 years it has fluctuated between 0,45 and 0,49.

In one respect, however, the Philippines stands out favourably compared to most other developing countries, namely by the fact that the incidence and severity of poverty is much lower among elderly and female headed households. Only 8 % of the poor households are female headed.

Agriculture

In the 1960s and 70s Philippines successfully exploited "the green revolution", and was able to increase its agricultural *value added* by an average of 5 % per year. This impressive growth, however, did not translate into a large reduction in rural poverty. This was due to the distorted situation with a highly capital intensive production technology and the very skewed distribution of land holdings. Also, most government subsidies (direct and implicit) for credit and fertilizer went to the bigger farmers, who normally also had greater access to irrigation, roads and electricity.

Poverty is primarily a rural problem. About half of the rural population is poor, and they account for two thirds of the country´s total poor. Experience

from other East Asian countries, that have been successful in reducing poverty, shows that rural poverty cannot be solved in the rural sector alone. There is a need to achieve and sustain a substantial growth rate for the economy as a whole. Moreover, specific interventions are also needed to secure the participation of the poor in the growth process by increasing their access to land and to public infrastructure.

4. The Agrarian Reform Program

Inequality of land holdings

The concentration of land-holdings is not much different in the Philippines than in other Asian economies. The level of inequality is about the same as in Indonesia or Malaysia. It is worse than in Thailand, but somewhat better than e.g. India, Nepal and Sri Lanka. To distinguish it from other countries, one may say that the relatively high concentration of land holdings remained the same for many years without any changes to the better.

The relative distribution of land holdings can be measured using the same *Gini-coefficient* as when measuring income inequalities. This coefficient for the Philippines remained virtually the same - about 0,53 - from 1960 to 1980, in spite of a number of land reform efforts undertaken during these years. By 1990 the coefficient had gone up (=inequality worsened) to 0,57, in spite of legislation and implementation of land reform. In 1988, 86 % of the country´s landowners had farms 7 ha or smaller, accounting for 23 % of total agricultural land, while less than 2 % of the landowners, with farms 24 ha or bigger, owned 36 % of total agricultural land. At the same time 9 % of the families controlled and owned 83 % of allagricultural land. Of 10 million agricultural workers about half were landless. Of the remaining 5 million, two were tenants and three owners or squatters on public land. Average farm size was 2,2 ha in 1991 compared to 3,6 ha in 1960.

Another feature which sets the Philippines off from its Asian neighbours is the co-existence of many small peasant farms alongside with large plantations. This is a unique feature for Asia and reminds of the situation in Latin America.

Necessity of land reform

The need for a land reform in the Philippines is uncontested.The World Bank in a recent report concludes that *"an important cause of poverty and under-development in the Philippines is the way in which the nation´s primary resource - land - is used and controlled"*. Land reform is today, and has been for many decades, perhaps the country´s most burning *political* issue, and the implementation of an effective land reform is by many believed to be a

necessary condition for avoiding social and political unrest in the country. This also seems to be the Government's position, and explains why the present administration, led by a former military, is able to accelerate the implementation of land reform without much - at least not overt - opposition from the country's very strong conservative, oligarchical interests.

Finding: Land reform is today, and has been for many decades, perhaps the country's most burning *political* issue, and the implementation of an effective land reform is by many believed to be a necessary condition for avoiding social and political unrest in the country.

The political importance of land reform is partly explained by the many people potentially affected by it. The current program is expected to benefit three million families. With an average family size in the Philippines of 6 persons, we have that almost 20 milliion people, or almost one third of the country's population, would be affected.

There are also two different, very forceful *economic* arguments in favour of a land reform. *Firstly*, it is conventional wisdom that land reform (not necessairily by itself, but *coupled* with effective infrastructure and extension services) is likely to increase productivity of agricaultural production, and thus raise the country's economic growth. There is now evidence from a number of countries that small-holder agriculture can be much more productive than large scale production.. Several empirical studies on farm size and productivity have, taking account of economies of scale, concluded that also in fairly technological and mechanized production areas, small farms can be more productive than larger ones.

Secondly, there is today an acute problem of under-investment in the agricultural sector, thought to be a direct result of the uncertainty regarding the actual implementation of the land redistribution which has been present ever since the CARP was launched in 1988. This uncertainty can now be expected to diminish because, since about two years, the implementation of CARP is moving forward rapidly, although still behind original targets.

Past efforts of land reform

The many political initiatives regarding land re-distribution, which have been taken over the last half century, achieved very little by way of changing the country's agrarian structure. Most of the efforts were focused on converting *sharecropping* arrangements to *leasehold tenancies.* Ironically this policy seems, however, instead to have worsened the chances of the landless to get access to land, because it led landowners to evict their tenants and replace them with hired landless workers.

CARP

The Comprehensive Agricultural Reform Law *(CARL)* , enacted in June 1988, extended the coverage of agrarian reform which existed previously to *all* agricultural lands, not just to tenanted lands. At least on paper, it is a very radical reform not only because it covers all agricultural lands down to 5 ha (which means three quarters of the country's total agricultural lands), but it also legitimizes the illegal occupation by squatter of large areas of public lands which has taken place through the years. In all it covers one third of the country's land, or 10,3 million ha. It was to be implemented during 1987-1998 in three overlapping phases, and it is to benefit 3,9 million *Agrarian Reform Beneficiaries, ARBs.* In most of the cases these beneficiaries are already on the land as tenants renting from the land-owner. In 1996 the total area to be covered by CARP was revised downward from 10,3 to 7,8 million ha. Of these, 4,3 million are private lands and 3,5 ha public or government owned lands.

The system for implementing this law is called Comprehensive Agricultural Reform Program, *CARP.* (The CARP was actually started in 1987 - before the legal framework of CARL was provided). An important feature is the planned provision of a massive package of infrastrucure investments and various agricultural services. Individual ownership is limited to 5 ha with an additional 3 ha allowed for each family member.

Land owners are compensated based on three criteria: productive value of land, the value declared in tax returns, and the market sales value. The families receiving nationalized land, the beneficiaries, are to pay for the land over a 30 year period at an interest rate of 6 %. The landowner receives 30 % of the payment in cash, and the remaining 70 % in the form of Government bonds maturing over 10 years.

The financial intermediary is the Land Bank of the Philippines. Most credits to the beneficiaries are given in wholesale fashion to cooperatives, which the beneficiaries form specifically for this purpose - sometime without the cooperative having any other activity than receiving and distributing the loan. Extending credits to individual farmers would not be economically feasible at a low interst rate as 6 %.

Land redistribution

The targets as well as the achievements to date for different categores of lands to be nationalized and distributed can be seen from table 5.

Table 5: *Comprehensive Agrarian Reform: Targets and achievements in land redistribution as of June 30, 1996; thousand ha*

	Original target	Revised target	Achieved	% achie-ved
(Tenanted) rice and corn lands	728	575	489	85
Settlements landed estates		644	633	98
Other private agricultural lands	2,287	2,221	558	25
Government owned lands		850	683	80
Public alienable and disposable lands	4,595	2,340	859	37
Integrated social forestry lands	1,880	1,200	730	61
Total	10,296	7,830	3,951	50

The last two land-categories (Public A and D lands, and ISF lands are implemented by DENR, while the rest is the responsibility of DAR. DENR does not issue land titles but so called *ISF-certificates,* bestowing on the beneficiary a right to use the land but not own it.

Within the category "other private agricultural lands" are three different groups: land holdings above 50 ha, which are to be redistributed during the second phase of CARP, holdings 25 - 50 ha, and holdings 5 -25 ha, the latter two to be implemented during the last phase of the CARP.

Following very slow progress during the initial years implementation of land redistribution has picked up dramatically since 1994 resulting in 50 % of the overall targets having been achieved to date. It should be noted that in these figures are included some rice and corn lands, as well as settlements, distributed during an earlier land reform program, i.e. before CARP.

. Most available public lands have now been redistributed, as well as most private lands above 25 ha. All big land owners in the Philippines have already lost their lands, except for the lands that were exempted from CARP because they were deemed to be successful commercial operations, like e.g sugar plantanations. But these plantations were instead forced to implement a profit-sharing or a stock option scheme for the benefit of their employed workers.

Not surprisingly the redistribution work is lagging behind - mostly in the privately owned lands, because that is the part which, for natural reasons, is the hardest one to implement. But the reason is also that the work was mainly

planned that way, i.e. start with the Government lands, then distribute the privately owned. By June 30th 1996 80% of the government owned land had been distributed, but only 25 % of private agricultural lands. At the same time fully 98 % of the category settlements/landed estates, and 85 % of Rice and corn lands had been distributed. Overall DAR has today distributed 55 % of its assigned target, while DENR has achieved 45 %, giving a grand total figure of 50%.The next phase to implement concerns the private agricultural lands from 5 to 25 ha.

As for the land surveys preceeding aquisition and distribution, DAR had by june 1995 carried out only 46 % of its needs.

Total number of previous landowners affected by nationalizations were 24,858 and number of farmers-beneficiaries having received land were 285,000.

Findings: Following very slow progress during the initial years, implementation of land redistribution has picked up dramatically since 1994. Most available public lands have now been redistributed, as well as most private lands above 25 ha. All big land owners in the Philippines have today already lost their lands, except for the lands that were exempted from CARPbecause they were deemed to be successful commercial operations like e.g sugar plantanations. Redistribution of privately owned lands lags behing that of Government owned lands.

Bottlenecks

In spite of impressive achievements during the last few years the program is still well behind schedule. There are many interrelated factors explaining the very slow initial implementation of CARP:

- loopholes in the law
- institutional bottlenecks in implementing the program
- absence of accurate data on land-ownership
- tenurial relations etc.

They could be summarized in the following categories:

- inadequate institutional capacity and capability
- limitations of financial resources

Even though the program is today moving ahead speedily most of the bottlenecks seem to persist even now - although probably to a lesser degree. What has made the difference however is the strong political comitment from the top, and the power and influence to go with it. An important bottleneck to speedier land aquisitions and redistributions is also the lack of survey capability.

In a project brief regarding a proposed World Bank *agrarian reform communities development project* factors as budget restrictions, cumbersome

bureaucracy, and internal controls are mentioned as the main obstacles affecting CARP performance. As regards the relatively slow pace of *land surveys* the following constraints are mentioned as the main causes:

- inadequate equipment
- inadequate communication facilities
- lack of computers
- the slow pace of reducing legal challenge, and
- shortage of trained extension experts

Another problem of CARP is that is not uncommon for the beneficiaries of land reform to resell their land, ususally back to the former owner, although they are formally prohibited to do this during a 10 year period. It is done by transferring the deed formally only after the 10 years have elapsed. In some settlements it is reported that as much as 20 % of redistributed land has been resold. The proneness to sell will naturally be a function of how well the new farmer is doing economically. This underscores the importance of infrastructure and extension serveces, in order to increase chances for the new owners to succeed.

Finding: In spite of important achievements during the last few years the land reform program is still well behind schedule. Many of the the bottlenecks to implementation seem to persist, among them: loopholes in the law, institutional bottlenecks, absence of accurate data on landownership and tenurial relations, limitations of financial resources, lack of surveying capacity

Other components of the CARP

Apart from the redistribution of land there are the following other components of CARP:

Non-land transfer activities: The landowners who can prove that their land is currently being utilized for viable commercial operations are given exemption from land nationalization, on condition however that they accept to involve the workers in some kind of production or profit sharing scheme or in a stock distribution option.

Beneficiaries development: As was mentioned above the CARP includes a massive program of various types of infrastructure support, credit assistance and agricultural extension support services.

Delivery of agrarian justice: To assist the beneficiaries as well as the former land-owners in all kind of legal matters is also part of CARP activities. By June 1995 there had been a total number of 42,485 cases received by courts, of which almost 35,000 had been settled, leaving a backlog of about 25

%. Boundary conflicts between new owners are very common, often arising as a direct result of unclear land demarcations. So there is a constant need for surveying and computerized cadastral information in order to make the system reliable.

The land redistribution process, which consists of acquisitioning the land from the former owners and distributing it to the *beneficiaries* , includes the following categories of work:

- reconstitution of lost or damaged survey records by the DENR
- land surveys of private and public lands by DAR and DENR
- inspection, verification and approval of survey returns transmitted by DAR and DENR
- land titling and registration by the LRA
- distribution of emancipation patents and certificates of land ownership awards (*CLOAs*) to farmer-beneficiaries by DAR

All of these stages of the land redistribution process can be said to directly or indirecltly benefit from the computerized cadastral support systems instituted at DAR with the help of Swedesurvey.

Finding: Most of the many different activities involved in the land redistribution work of CARP stand to benefit directly or indirectly by the cadastral support services project

Infrastructure and agricultural support services

Although land reform can potentially play an important economic and political role, it is not a panacea for poverty. As the experience from many other countries shows, successful reform must include the provision of rural infrastructure and technical support to make small farms productive and prosperous. Korea, Taiwan, and more recently Malaysia, Indonesia and China carried out not only land reforms, but also invested heavily in agricultural infrastructure and agricultural technology, and have thereby been successful in decreasing rural poverty.

This point is also confirmed by a survey in the Philippines showing poverty to be just as high among self-employed farmers as among rural families receiving wages. The rise between 1960 and 1980 of operator-owned crop and livestock farms from 45 to 59 % did not show any correlation with a drop in poverty. What was apparently missing for these self-employed farmers to become successful was adequate access to infrastructure and extension services.

Conclusion: Land reform by itself is not a panacea for poverty alleviation. It can be seen as a necessary condition, but not a sufficient. Experience from many other countries shows that it must be accompanied by important provisions of infrasturcture and agricultural services to the new farmers-owners

The Government's current spending on agriculture by the World Bank's analysis is grossly inadequate. Agriculture's share of the total spending declined from about 11 % during 1976-83 to an average of 6 % during 1992-94, making it the lowest among all ASEAN countries.

Within the Government's agricultural budget there has been a shift away *from* spending on research, irrigation and community development *to* agrarian reform, environment, and price support.

Most of the budget allocated for the CARP program is now used up to pay former land-owners for the nationalized land. In the World Bank's view this represents a shift away from tried and true methods of directly supporting sectoral growth and indirectly alleviating rural poverty to methods that seem to be more direct but which have not yet proven to be effective.

The relative returns to investments in agrarian reform versus physical infrastructure, which improves access to markets, have been investigated using household earnings data with the following results: Simply redistributing land was found to have little effect on earnings in rural areas or on aggregate poverty and inequality. Instead, increasing the access of the worst off regions to paved roads and electricity could reduce poverty significantly by improving productivity and earnings.

In the Philippines today an estimated 50 % of the communes (*barangays)* lack all weather roads. Of provincial roads 40 %, and of *barangay* roads 50 % are in such poor condition that they cannot be maintained, but must be rebuilt. Only 12 % of crop-growing poor households receive information about seed utilization and crop management, and only 20 % have access to irrigation, use high yielding varieties, or practice interplanting or double cropping. This means that there is a very large potential for improving productivity among poor farmers in the Philippines.

Problems and needed reforms in CARP

Most observers seem to agree that a very important motive for pushing forward with the land reform is a *political* one. This stands irrespectivly of the economic profitability of the reforms and of the efficiency with which they are implemented. However, as the World Bank points out, the government's chances of being able to implement the reforms will - at least in the long run - depend also on how efficiently it is done, as it may simply run out of financial means to implement the reforms. As was mentioned above, most most of the funds allocated for CARP today are used up to pay the land-owners for the nationalized lands, leaving little for needed infrastructure.

Finding: Most of the funds allocated for CARP today are used up to pay the land-owners for the nationalized lands, leaving little for needed infrastructure.

The long run success of CARP probably also depends on the new owners becoming economically better off. Therefore one needs to see land reform also as a question of alleviating rural poverty, and not only as a political problem. and for this there is a need for a more integrated approach, including infrastuctural investments and agricultural extension support services. This is also the way the Government perceives the CARP today, but, according the the World Bank, a number of changes need to be made in the current program to reflect the fact that land reform is largely a question of alleviating poverty, as the program, according to the Bank, "is now entering a more complex and expensive phase."
To note here is that possible modifications in CARP would have no implication for the Sida-supported cadastral support system, since the need for systematic cadastral information systems would not be changed.

Finding: according the the World Bank, a number of changes need to be made in the current program to reflect the fact that land reform is largely a question of alleviating poverty

The necessary changes are by the Bank summarized as:

" improving access to the means of production by the rural poor by focusing rural land reform on the do-able, promoting tenancy reforms and market assisted land reform, and ensuring the essential investments in rural infrastructure and improvements of agricultural extension services necessary to raise productivity and thus incomes."

One factor delaying the reform work of CARP is today the complicated procedure for land valuation. According to the law about 10 different factors are to be taken into account when establishing the proper price which has to be paid for the nationalized land. This invites to abuse. Many instances of gross overvaluations have been found in the lands that are offered voluntarily by land-owners. There are today approximately 9000 court cases pending regarding land valuation and other legal disputes.

The legal prohibition of *share tenancy*, which was introduced in the Philippines in 1972 , led land-owners, as was mentioned above, to evict its tanants and replace them with hired farm workers, thus defeating the purpose of giving *more* farmers acess to the land. Moreover, recent empirical research shows that economic efficiency of production can be just as high under share tenancy and fixed contract as under owner farming.

Prohibiting share tenancy restricts the opportunities for especially the

poorest, namely the landless farmworkers, to "move up the agricultural ladder." In the analysis of the World Bank, as the wage worker accumulates experience, he or she can become a tenant farmer and eventually an owner cultivator.

Another limiting factor is the ban on *changing* the land use category in the areas designated by the CARP. This leads to less efficient land use overall in the country, and also invites to various types of misuse and rent-seeking behaviour.

A fundamental critique from the Bank against CARP is implied by its grave doubts that the Government will be able to raise sufficient funds to afford the entire redistribution program. This leads the Bank to the (politically) most drastic suggestion that CARP "be limited only to areas where the land tenure problems are most pressing and oriented to assisting the poorest agricultural workers." It would thus cease to be a universal land reform, and become targeted at those districts of the country with the most pressing economic problems.

The World Bank further suggests that the land reform should be reconsidered in near-urban or rapidly urbanizing areas where the value of land in non-agricultural uses exceeds that in agricultural uses. For the aquisition of such land would be extremely expensive for the Government, and in any case it would be doomed to go out of agricultural production in the near future.

The Government should also desist from nationalizing lands smaller than 25 ha, since it would be much more complicated and costly to survey and legally process many small and scattered plots of land than bigger ones.

Further, the Government should consider making the land reform more *market-oriented* by removing all regulations and subsidies that today artificially raise the value of land. A very important factor in this connection would be to impose a stiff *land tax,* as this would encourage many large land owners to sell voluntarilry, because it would reduce their incentives to hold on to idle lands. It would also encourage them to abandon inefficient farming methods. Such a market oriented approach to land reform would also avoid many of the delays caused today by valuation disputes by making the valuation process privatized and decentralized.

According to the World Bank there are also a number of actions which the Government could take in order to increase the profitability of farming *without* costing scarce budget funds. One such initiative would be to abolish the monopoly that the *National Food Authoriy*, NFA, today enjoys in international trade in rice and corn. The NFA´s many interventions in the food market have not only cost large sums of budget funds without benefiting the poor, but also led to structural distorsions and inefficiencies in the country´s economy.

Another example could be recent decentralization efforts including devolution of central government functions to local government. Though

positive in principle, this reform is thought to have led to uncertainty and to political influence in the provision of infrastructure and agricultural services.

Another point to consider is that the responsibility for implementing agricultural policy, including CARP, has been spread thinly over many Government ministries and agencies, thereby possibly rendering it less eddective.

To sum up, *if* the overall objective is set as *achieving maximum poverty alleviation among the rural poor*, then - following the World Bank's analysis - we must conclude that the CARP should be modified by:

- focusing the land redistribution work to the areas where need for it is perceived to be the greatest, thereby
- freeing more funds which can be used for an increase in infrastructure and agricultural services support
- taking all possible steps to make the land reform program more market oriented, and thereby more decentralized, as this would avoid many of the obstacles and delays experienced by the program today.

If, on the other hand, one believes that the *political* dimension of land reform is all important, namely that the redistribution of land in itself is a necessary condition to preserve social and political peace in the country, then the Government is obviously limited in its options to cut down the scope of the present universal land reform program.

Conclusion: *If* the objective is set at *achieving maximum poverty alleviation among the rural poor*, CARP should be modified by (1) limiting land redistribution to areas where need for it is perceived to be the greatest, thereby (2) freeing more funds for infrastructure and agricultural services, (3) making the land reform program more market oriented, and thereby more decentralized, (4) introduce a land tax as this would encourage many land-owners to sell voluntarily or use their land more efficiently.
If, on the other hand, one believes that the *political* dimension of land reform is all important, namely that the redistribution of land in itself is a necessary condition to preserve social and political peace in the country, then the Government is obviously limited in its options to cut down on the scope of the present universal land reform program

5. *Management of natural resources and Environmental protection/enhancement*

(This section quotes in extenso from the above mentioned World Bank document)

The maior problems facing bio-diversity, natural resources and the

environment include over-exploitation of natural resources, deforestation, severe soil erosion, and pollution. These problems are likely to become more severe because of a rapidly growing population and increasing industrialization and urbanization.

Deforestation. The country has lost a substantial proportion of its primary forest since the early 1990s. Forests now cover only about 6 million ha of total land area, and deforestation continues at an estimated annual rate of 100,000 ha. One of the major causes of deforestation is shifting cultivation in the uplands. The scarcity of arable land in the lowlands has compelled landless people to migrate into the uplands, where they convert primary and secondary forests into farmlands. Every 3-5 years, when soil nutrients begin to decline, they move on to new areas.

Commercial logging also contributes to deforestation. The extensive loss of forest cover has resulted in substantial soil erosion. About one third of forest lands are today estimated to be severely eroded because of extensive cropping. In addition, agricultural productivity in the uplands remains marginal because of major losses of soil nutrients assocated with severe soil erosion. Upstream erosion has also had a major downstream impact in terms of increased siltation which threatens vital infrastructure including irrigation, hydro-electric power, and municipal water installations.

Destruction of coral reefs and mangrove forests. Coastal resources are threatened by over-exploitation and the widespread use of illegal and destructive fishing methods. Coral reefs are among the most threatened coastal habitats. An estimated 30 % of the total coral reef area in the country has already been destroyed and another 30 % is in poor condition - altogether about 300,000 ha. Mangrove forests are also under threat, primarily due to illegal construction of fish ponds and felling for fuelwood.

Air pollution. Air pollution is another environmental problem, though it is limited to major industrial centres and urban areas with heavy traffic. Vehicles are the major source of air pollution. The most polluting industrial operations are power generation, cement manufacture, petroleum refineries, and chemical plants.

Water pollution. About 30-40 % of the 400 major rivers in the country are heavily polluted, mainly by untreated industrial discharges and municipal waster. Industry is mainly responsible for toxic and hazardous wastes, which contaminate water through uncontrolled discharge or disposal in unsafe landfills. Private households are the chief contributors to organic water pollution and solid waste.There are three reasons for industry's reluctance to invest in pollution abatement: weak enforcement of environmental standards, lack of incentives to invest, and lack of information about cost-effective abatement strategies.

Findings: Philippine environment today suffers from over-exploitation of natural resources, deforestation, severe soil erosion, and pollution, and the problems are likely to become more severe because of a rapidly growing population and increasing industrialization and urbanization. *Deforestation* continues at an estimated annual rate of 100,000 ha. Coastal resources are threatened by over-exploitation and the widespread use of destructive fishing methods. An estimated 30 % of the total *coral reef* area in the country has already been destroyed and another 30 % is in poor condition. One third of the country's 400 major rivers are heavily polluted.

Government actions

Public expenditures on natural resource management and environmental protection have grown by almost 20 per annum over the last five years. This represents a welcome change in Government strategy and has been accompanied by several policy and institutional changes intended to preserve the Philippine's rich bio-diversity and fragile environment.

As a direct result of the knowledge derived from the satellite maps provided by Sweden's Satellitbild AB as part of the Swedish-financed project, the Congress has passed legislation increasing logging stumpage fees, banning commercial fishing gear from Manila Bay, and greatly reducing commercial logging. Because of this, during the last 10 years, log production has drastically gone down - from 3,7 cubic metres in 1986 to 0.96 cubiic metres in 1994.

In addition a master plan for forestry development has been prepared, out-lining policy reforms and investments necessary to ensure efficient and equitable management, conservation, and utilization of forest resources. The DENR has also made major strides on preservation of bio-diversity through the passage of the *National Integrated Preotected Area Systems Act*, the estasblishment and rehabilitation of mangrove areas and artificial coral reefs under the *Coastal Environment program*.. Progress has also been made in

- designing a strategy to encourage industry to prevent and reduce pollution, and over time
- to internalize the cost of pollution abatement
- strengthening monitoring and enforcement of environmental policies
- creating financial incentives for industry to undertake abatement on its own initiative through the introduction of a pollution charge and by offering soft funding for pollution abatement investments, and
- facilitating transfer of know-how on cost-effective abatement technologies to industry through training activities and advisory services.

Despite the significant progress achieved, several institutional and resource allocation issues remain to be addressed. Among them DNER's capability of effectively handle the environmental issues. At present DENR has a very wide responsibility covering regulatory functions, conservation, mining sector development, and industrial promotion. The World Bank advocates that a

study be made on DENR in order to "review its current mandate, resources and a future institutinal framework to deal with the functions currently entrusted to it." Another issue is the absence of an effective national-level coordination for watershed management planning, implementation and monitoring. So far it seems that most of the watershed management activities launched have had little impact on achieving the intended goal of reducing soil erosion and improving water quality.

Increased employment opportunities outside of upland and coastal agriculture will be central to alleviating environmental concerns within these areas. The Government is promoting more sustainable farming techniques and vigilance against illegal logging through community based efforts. Regarding urban pollution the Government´s efforts are focused on controlling industrial air and water pollution and improving human and industrial waste mangement. Enforcement of existing environmental regulations remain difficult, however, primaily reflecting inadeaqute institutional and financial capacity.

As was mentioned above Sweden´s aid program to the Philippines has contained a relatively large number of environmental projects, beside the one on Satellite mapping evaluated in this report. They are: community based forstry management, pollution from dumping project (VBB VIAK AB), solid waste pre-investment study, environmental management for industries, industrial environment, rural water supply, and environmental management for small industries. In addition, several of the international courses financed by Sweden with Philippine participation have been on environmental issues.

Finding: Public expenditures on natural resource management and environmental protection have grown by almost 20 per annum over the last five years. Despite significant progress achieved, several institutional and resource allocation issues remain to be addressed. Enforcement of existing environmental regulations remain difficult, primaily reflecting inadeaqute institutional and

II THE EVALUATION; METHODOLOGY

1. Reason for, scope and focus of evaluation

Reasons
Three different reasons have, more or less explicitly, been stated for this evaluation. *Firstly*, and seemingly the most important, is the fact that Sida in the winter of 1996/97 was in the process of formulating a new country aid strategy for the Philippines, and therefore needed information on if and how well the two projects "fitted" into this strategy. Given that the Philippines aid program had been brought into new Sida by BITS, with an aid profile clearly different from SIDA´s, and that all new country strategies had to be shaped so as to fit a profile adequate for the new, merged aid organization, this strategy work was not merely a formal exercise. Each prospective component project of the new aid program had to correspond to the common criteria chosen by Sida for each recipient country. The contents and shape of these criteria are the result of a complex analysis of the perceived needs of the recipient country in question, and the character and capability of what the Swedish resource base can offer. In the case of the Philippines, a middle income country, with an average income at least twice as high as Sweden´s regular program countries in Africa, an overriding criteria for any project to qualify as grant aid seems to be that it be "strategic" or "catalythic" and somehow geared towards the needs of the poor or be beneficial for the environment.

Secondly, there is the usual duty for any donor to evaluate projects which had been completed. Both of the projects had recently been completed, and one of them - *cadastral support to land reform* - had never been evaluated before, save for a seven-page follow-up report in 1994. The other project - *Satellite mapping of natural resources* - had been evaluated in 1992.

Thirdly, for both projects Sida had been approached by the respective Philippine recipient ministries with a request for continuied financing, and Sida was in the process of studying the two proposals for renewed assistance. Sida therefore needed advice regarding the soundness and suitability of the renewed projects.

Scope
The scope of the evaluation, as given by the terms-of-reference (in different words), is to analyze achievements and effects of the two projects at three

different levels, namely

- the project level: Have *output* targets been achieved, and how efficiently? Has replication and/or integration with similar systems of other agencies been achieved? How has the contractor performed?
- the program level: What has been the *effect* of the project?

(1) In the case of the Cadastral support service project: What is the effect of the project on the *Comprehensive Agrarian Reform Program?* Has the DAR-Swedesurvey project contributed to or facilitated a speedier implementation of the CARP?
(2) In the case of the Satellite maping project: What is its effect of the project on the environmental management and enhancement work performed by DENR? Has the technical assistance provided by SSC Satellitbild AB contributed to a more efficient and better natural resource management work by DENR?

- the national level: What is the *impact* on the national level?

(1) in the case of cadastral support project: what is the *impact* of the CARP on national goals of economic and social development? Has the CARP been a successful program? Is it in reality an important, effective and realistic means of achieving overall national goals? Is it actually achieving poverty alleviation for the country's rural poor?
(2) in the case of the satellite mapping project: What is the impact on the national environment of the work done by DENR (and perhaps other users of the project's satellite maps)? Has the country's management of natural resources and the environmental situation been enhanced by this work?

In addition to analyzing the outcomes of the two projects at the *project*, *program* and *national* levels, the evaluation should also assess the project's suitability in a future Swedish aid program for the Philippines.

Focus.

Although conceptually the projects are to be analyzed in uniform fashion, there is in practice an important difference between the two, namely in required depth of analysis. The *cadastral support service project* on the one hand has never been evaluated before and therefore requires a complete evaluation. The *satellite mapping project* on the other hand, was evaluated in September of 1992, and project activities since then have in reality only consisted in three different follow up activities which were for all intents and purposes already covered in the 1992 evaluation. There is therefore no need for the present evaluation to analyze the latter project at any depth. Instead we can focus on particular aspects which, for some reason or other, deserve special attention.

One such aspect is the donor's desire that the techniques and methodologies introduced by the Swedish consultants and developed in the two respective projects be spread to and replicated in other relevant agencies and departments - including local governments - of the Philippine Government. Concomitant with this is the donor's fear that lack of coordination and

cooperation within the Philippines Government will lead to the techniques and methodologies being duplicted and incompatible systems being installed in different agencies.

Given the fact that *Geographical information systems* of different kinds and for different uses are now being installed in many different agencies and departments - perhaps as many as 40 -, it is clear that the question of replication and duplication is most relevant in both of the projects evaluated here. We will therefor address this topic in a separate chapter V.

Exhaustive technical project report. Another factor influencing the relative focus of the evaluation regarding the *cadastral support project* is the fact that the Swedish consultant Swedesurvey in September 1996 submitted to Sida a final report (which it is obliged to do under the contract) of very great technical detail. This report, by providing a seemingly exhaustive account of all inputs, activities and achieved targets of the project's phase III, will permit an expert reader to judge whether all project components have in deed been carried out at a technologically satisfactory level. This circumstance is presumably the reason why Sida chose an economist and not a technical expert to carry out this evaluation.

My on-site inspection of the technical aspects of the project have been made with a view to confirm that the different systems are in deed functioning and that the respective officers "know what they are doing". I have thus not had the need (nor of course the knowledge) to ascertain technical aspects such as whether the equipment installed by Swedesurvey is the technically most approriate and the most up-to- date, or that technically optimal soft ware has been chosen. The exhaustive documentation provided by Swedesurvey would allow such verification to be made at any time by the appropriate expertise.

2. *The assignment*

The assignment was for 25 man-days which were spent as follows:
5 days of preparatory work in Sweden, mainly reading project documentation;
14 days visit to the Philippines, and 6 days for analysis and report writing.
Almost half of the time in the Philippines was spent visiting the project sites in Mindanao island - Bukidnon and Talacagnon.
In Manilla three days were spent at DAR Headquarters in Quezon city watching (inspecting) project work, interviewing about 10 different officers of the cadastral support unit, and meeting with some of NEDA's responsible officers.

Two days were spent with the DENR discussing the satellite mapping project, and one day with NAMRIA inspecting their processing work of the satellite maps delivered by Satellitbild.

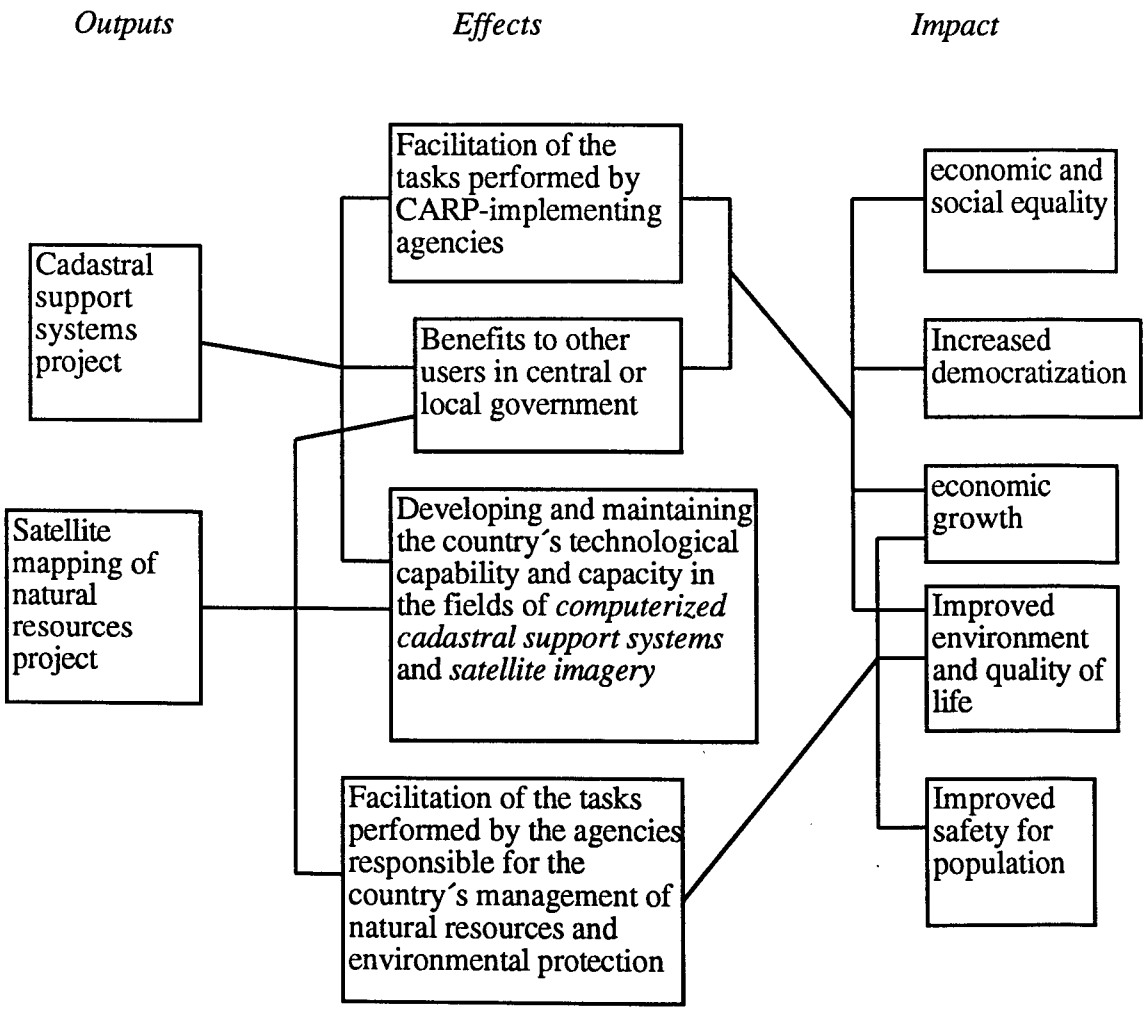
3. *Methodology*

Our analysis, in chapters III and IV, of the two projects will follow the following scheme:

Firstly, for each of the projects we will construct a goal hierarchy based on a *logical framework anlysis* of the respective project. As is often the case, this goal hierarchy could not be based solely on the targets and objectives as stated explicitly in the available project documentation. Our analysis led us to include some elements which were overlooked (or at least not explicitly mentioned) in the project documents.

Although the two projects are obviously related by virtue of having some common effects and long run objectives, it is *not* practicable to analyze them together in one and the same logical framework context.
However, a common *goal hierarchy* structure for the main ingredients of the two projects can be shown schematically as in figure 2.:

Figure 2: Goal hierarchy for the *Cadastral Support Systems* and the *Satellite Mapping* projects combined



In the respective chapters III and IV below we will construct complete logical framework schemes for each of the projects separately.

Secondly, we will assess against planned targets the outcomes achieved at the different levels of the project's goal hierarchy, namely implementation of inputs and activities, results/outputs, effects, and impact.

Thirdly, we will assess the project's outcome with respect to the following aspects:

- Social and economic equality/ Poverty orientation
- Economic growth
- Democratization
- Independence
- Environment
- Gender
- Sustainability/ relevance

4. Availability of data

Cadastral support services project

Availability of data at project level was very good. It was obvious that project personnel had devoted much attention to presenting relevant information and data in a clear and systematic way. Perhaps this is in response to the critique which was directed at the project by the follow-up carried out in 1994, which found the program documentation to be insufficient.

On sectoral and national level, availability of information was generally less good, but adequate, except as concerns economic profitability. It does not appear that the Philippine Government has access to studies showing the economic profitability - for the beneficiaries as well as for the country - of undertaking land redistribution under different circumstances and under different assumptions. This might seem surprising but underscores the point that land reform in the Philippines is more than anything else conceived of as a political problem, rather than an economic one.

Satellite mapping of natural resources

For this project availability of data was not good. It appears as if there is no document which states comprehensively all the different phases and revisions

of the collaboration between the Philippine Government and SSC Satellitbild, describing the contents and the costs of the different phases. For the three different phases of the project, which we have identified, the availability of reports was as shown in table 6.

Table 6 : *Data availability for the Satellite mapping of natural resources project*

Type of document	Phase I	Phase II	Phase III
Project memorandum or BITS decision memo	no	no	yes, 4 pages
Plan of operation, or project proposal	no	no	yes
Contract	yes	yes	yes
Various project reports	no	no	no
Information brochures	yes, 5 pages	yes, 2 pages	no
Project Final report	no *	yes, 6 pages	no
Evaluation	Yes	no	

* This report exists, but was not available to the mission

The table shows the data which I was able to retrieve for this evaluation, given the somewhat limited time that could be devoted to search of archives. It is not clear if some of the documents do exist; whether they were produced by the project or the contractor, and whether or not they were sent to BIT/Sida. Regarding some documents I was subsequently informed that the documents *do* exist, even though they were (for various possible reasons) not available to the mission. Given that this project was not the main focus of this evaluation only limited effots could be made to search for documentation, although we did ask for them. A reason why no final report was produced for phase III is reported to be because the project contents was cut down so as to contain only delivery of equipment and products.

Regarding the effects and impact levels, i.e. *management of natural resources and environmental protection* of the DENR and the Philippine Government, there was much less information available than for land reform, and this information was mostly of very general character. From the documentation made available to this evaluation it was not readily apparent what concrete actions DENR had taken, nor what these actions had resulted in.

FINDINGS

III THE CADASTRAL SUPPORT SYSTEMS PROJECT IN SUPPORT OF LAND REFORM

1. Goal hierarchy/the logical framework

Stated targets
The project´s targets at the various levels are by the relevant project documentation stated as the following:

Overall objective
- to promote economic and social equality in the Philippines by enhancing effectiveness of land reform through more efficient registration of land ownership

General objectives
- to operationalize the system (CARP/CSS) developed in Phase II at the regional, provincial and municipal levels
- to integrate the developed system with other CARP implementing agencies

Specific objectives
- to sustain the developed system and implement it in other DAR projects
- to further improve the techniques, especially in data captureto link the outputs of the photogrammetric work with the established data capture system
- to coordinate with the DAR *Management Information Systems Office* in the design and development of the textual/attribute database.
- to conduct on-the-job training for DAR technical staff
- to conduct seminars/workshops for regional, provincial, and municipal staff, and interrelated CARP implementing agencies on the project
- to strengthen the linkages between DAR and other CARP implementing agencies and come up with unified data and informations

Outputs
- a computerized system designed to capture, compile and present data in statistical form (attribute database) and digital data base (spatial database)
- technical reports
- digitized/plotted maps (thematic maps, large/small scale maps)

- computerized databases (graphical)
- photographic maps
- well trained staff in computerized data capturing/presentation techniques
- seminars and workshops on GIS/LIS at the DAR regional, provincial and municipal levels, and at DENR and NAMRIA
- user manuals for LIS, GIS and Surveying

Activities/inputs

Planning

- project organization
- organization of work groups and identification of tasks and activities (detailed work program)
- collection of secondary data such as maps, technical reports and analyses
- designing of the system and preparation of specifications/requirements of equipment and services

Project implementation

- data capture
- data compilation
- data analysis; transformations and manipulations
- presentation of outputs and informations

Technical trainings/seminars and study tours

- on-the-job training, short and long term
- on-the-job training conducted by Swedsurvey at regional, provincial and municipal levels
- seminars and workshops for DAR and for other CARP implementing agencies

Project consultancy

- project advisory
- project consultancy

The targets listed above can be considerably rationalized and simplified by clustering them differently. Also an analysis of the project's *logical framework scheme* and its documentation suggests that several modifications and additions need to be made.

Firstly, regarding the overall objectives, the BITS decision memorandum only states *one* - namely *economic and social equality* . In my opinion also other objectives are relevant and should therefore be added. It can be argued that the successful implementation of a land reform program can be expected to have an impact besides equality - namely *economic growth* as well as the *enhancment of democracy*. According to the Minister for DAR the land redistribution is done for social equity reasons and the infrastructure and extension support for economic growth reasons. Another reason to add objectives at the national level, is that the other uses on a program level of a successful *cadastral support systems project* (see below), can lead to other impacts at the national level. One example could be that the introduction of a

cadastral system in land use planning, including urbanization and selection of industrial sites, can be expected to enhance the objective of *wise management of natural resources and environment.* So also this objective should be added at the national level. The full relationships of the objectives and targets which I have added at different levels, can be seen in the logical framework goal hierarchy below.

In this context some criticism could be directed towards BITS´ project preparation work for not having sufficiently analyzed the goal hierarchy of the project. If they had done so by following through inputs and activities *upward* through the system, as well as working *downwards* through the system by tracing the various possible origins of assumed impacts, they would have arrived at a complete goal hierarcy based on the logical framework model. It should be noted however that this is not a very serious critique given that most aid agencies, including Sida, as late as in the early 1990s rarely bothered to exhaustively analyze a project´s goal hierarchy.

Secondly, the "general objective" which states "to operationalize the system *developed* (my italics) in phase II etc .." is not correct, since the system in question was *not* in fact developed during phase II. At least it cannot, in my opinion, be said to have been finalized. Therefore we need to add another objective like "to achieve a complete and fully functioning CSS/CARP".

Thirdly, regarding the *effect level*, there are two objectives which need to be added.The required objective, as set by Sida, of *spreading and integrating* the CSS to other agencies should in my opinion, be broadened to include also agencies of the Government (at central or local level) which are *not* involved in the CARP implementation. This is logical, for the raison d´etre of the CSS project is (or should be) much wider than for purposes of implementing the CARP only. Even though most of the potential users of a CSS today are to be found among the implementing agencies of CARP, it is clear that CSS can have a much wider interest. General land use planning, and taxation purposes are just two examples. The implication of this is that a project like CSS can be justified (if implemented efficiently) for other reasons than to implement the Comprehensive Agrarian Reform Program.

Finding
The project only states equality as an overall objective, but other objectives, are also relevant and should be added as the successful implementation of a land reform program can be expected to have an impact also on *economic growth* , *management of natural resources and environment* as, as well as *enhancment of democracy.*

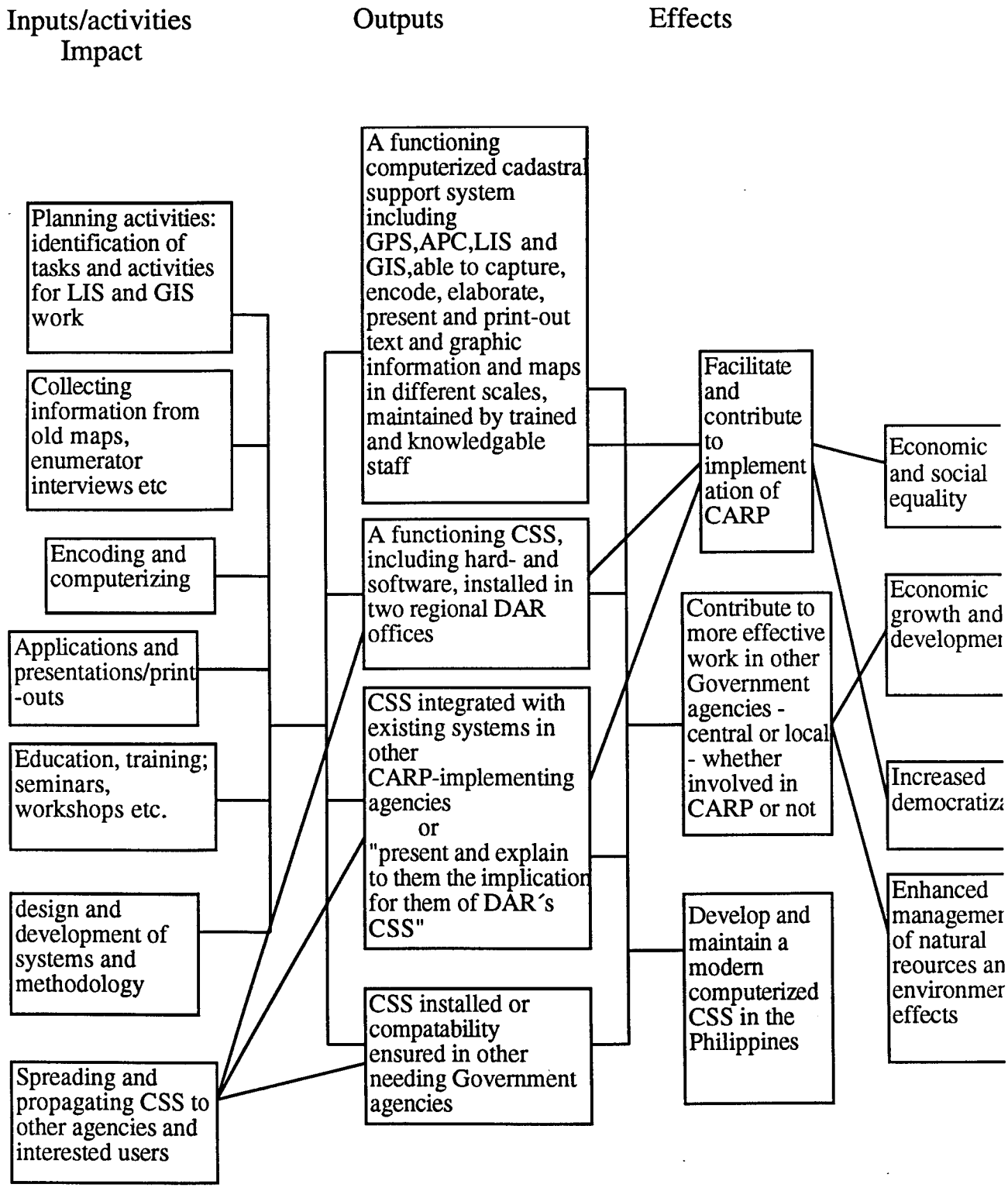
After undertaking all of these modifications we arrive at a *logical framework schedule* of a contents as shown in table 7.

Table 7: Logical framework schedule for cadastral support services for CARP project

TARGETS	As-sumptions	Cri-teria	Achi-eved
Inputs/activities -planning activities: identification of tasks for LIS and GIS work -collecting information from old maps, enumerator interviews etc. -encoding and computerizing -applications and presentations/print-outs -education,training,seminars, workshops -design and development of systems and methodology -spreading and propagating CSS to other agencies			
Outputs - a functioning computerized cadastral support system including GPS, APC, LIS and GIS, able to capture, encode, elaborate, present and print-out text and graphic information and maps in different scales. System operated and maintained by trained and knowledgeable staff - a functioning CSS including hard- and soft-wares, installed in two DAR regions - CSS integrated with existing systems in other CARP-implementing agencies or "explain and demonstrate to other agencies the implications for them of DAR's CSS" - CSS installed or compatibility ensured in other relevant government agencies			
Effects - Facilitate and contribute to speedier implementation of CARP - Contribute to more effective work in other Government agencies - at the central or local level - *whether involved in CARP or not* - Develop and maintain a computerized and modern cadastral information system in the Philippines			
Impacts - Economic and socila equality - Economic growth - increased democratization - Enhanced management of natural resources and environmental protection			

The LFA schedule depicted in graphical form as a goal hierarchy is seen in figure 3.

Figure 3: Logical framework goal hierarchy of the *Cadastral Suport to CARP* project



Based on this elaboration of the project's logical framework and its goal hierarchy, our analysis in this chapter will be disposed as follows:

- implementation: How have inputs been delivered and activities carried out? How has the contractor performed?
- results/outputs: Have *output* targets of the cadastral mapping support services been achieved? Has replication and integration with similar Cadastral Support Systems *(CSS)* of other agencies been achieved?
- effects: What has been the *effect* on the *Comprehensive Agrarian Reform Program?* Has the DAR-Swedesurvey project contributed to or facilitated a speedier implementation of the CARP? What has been the effect, if any, on other agencies?
- impact: What is the *impact* of the CARP program on national goals of economic and social development? Has the CARP been a successful program? Is it in reality an important, effective and realistic means of achieving overall national goals? To what extent have Sweden's overall development objectives been achieved?

We will also assess the project's outcome with respect to the following aspects:

- Social and economic equality/ Poverty orientation
- Economic growth
- Democratization
- Independence
- Environment
- Gender
- Sustainability/ relevance

2. *Implementation*

All the inputs and activities as foreseen in the project documentation have been duly implemented. The implementation seems to have been generally efficient and has proceeded smoothly. Only a few minor points need to be criticized or discussed.

Documentation

All documentation regarding the project seems to be complete, and is usually presented clearly and pedagogically. This is true for basic project plans as the specific terms of reference for all expatriate consultants, and the project's detailed budget and procurement lists, as well as for various other instruction and descriptive materials. A final report of the project has been produced which is more exhaustive and clear than one usually expects to find. A four

volume set of *User guidew/training manuals* has been produced that seems to be of high standard, and must have demanded so much time and effort that one hopes that they can be used also in other projects.

Documentation has also been prepared showing the results achieved in various operational skills for different tasks. Based on self-evaluation of the staff, there are tables showing *"confidence in handling software"* for different categories of staff and for different tasks. Another useful document is an inventory list showing not only the physical whereabouts of each piece of equipment, but also the officer in whose responsibility it has been entrusted.

Finding: All the inputs and activities as foreseen in the project documentation have been duly implemented. Only a few minor points need to be criticized or discussed. Documentation regarding the project seems to be complete, and is usually presented clearly and pedagogically.

Residence permanency of consultant

One of the few critiques which has been directed by DAR at the consultant concerns the absence of a permanent representative of Swedsurvey in DAR. This is a point which was raised already by the follow-up mission undertaken by BITS in 1994, and is of course well known by the consultant. There is today a very clear - and compelling - reason why there is *not* a consultant in permanent residence, namely that the contract is not big enough to pay for a full time consultant. Instead the consultant has tried to address this problem by scheduling the visits to the Philippines of the Swedish personnel in an overlapping manner so that there will at any given time be one Swedish staff present. The project document thus includes a flow chart where 33 different visits, mostly one or two weeks long, by a total of 15 persons from the consultant, have been scheduled so as to cover almost the whole two year period. The problem of course is that the swedish person in attendance at a given time may not represent exactly the expertise which is needed by the local staff at the particular time. The person usually needed on the spot in DAR is of course the chief project advisor, not least because he is the only one who can take decisions regarding purchases etc.

One of the interviewed local staff suggested that the only real, compelling reason why there was a need of having a representative of the Swedish consultant in place permanently was the need to be able to take administrative decisions regarding procurement etc. If this were true, the problem can be, at least partly, solved by transferring the right to decide about procurement to the DAR personnel. This point is further discussed below under **ownership.**

A factor to consider in connection with the discussion regarding residence permanency is the effect it may possibly have on the project's self reliance and aid dependence. It has been suggested that a full time permanent resident

manager from Swedsurvey would automatically lead to less practical responsibility for running the project being assumed or exercised by the DAR officers themselves.

Considering the above restrictions it would seem that also in the future the residency problem will mainly have to be solved by scheduling the visitis of the different Swedish staff as cleverly as possible. In adddition, the magnitude of the problem could be minimized by considering the transfer of as many duties as possible from the expatriate consultant to the local staff, including notably the resposibility for procurement.

A slighty different question of which the consultant is also aware is the wish expressed by the DAR project Director that certain of the visits by the Swedish experts should be longer than the ususal one week, because some of the issues at hand often demand more unbroken time in order to be tackled effectively.

This also relates to a point which was raised by the 1994 evaluation/follow-up report, namely that *"Swedish efficiency is not always conducive to effective transfer of knowledge. A "gentler" approach which would give trainees more time to work on their own, with expert support in the background, is necessary and strongly recommended"*. But it may not be entirely easy to satify this demand, for, overall there is a need for many different persons since each one represents a different expertise which the project needs at a certain point in time. However, the consultant is aware of this problem, and would be advised, if there is a continuation of this project, to work out a schedule which can optimally take account of all interests involved

Ownership

The question of project "ownership" has in recent debate on foreign aid been given great importance, and is understood to mean the extent to which the relevant authority of the recipient country assumes practical responsibility for project implementation.

In this case there is no question that the project emanates from within the Philippine Government, and not from the donor´s side, and the project´s content is based on actual needs felt and expresed by DAR. Nor is there a question of the fact that DAR knows what it wants and has overall charge of the project.

Nevertheless there are a few points, some of more formal importance, which need to be raised in this regard.

Firstly, there is the responsibility for procurement in the project. Formally this rests, as it should, with the recipient Government as the contract´s paragraph 5 stipulates that *"The aproval by DAR of of the quarterly report will be considered by BITS to be the approval of the corresponding payment"*. In practice however, at least in most projects, it is entirely within the consultant´s domain to plan and carry out purchases. Often, it is only the

consultant who possses the practical knowledge and the contacts to carry out the task efficiently. As long as there is full agreement between Government and consultant regarding what and when should be purchased this is usually what most people would see as the normal division of labour. We are not aware of any differences in opinion in this project as to the use of funds, but nevertheless the formal aspect of who has the right to do what is important.

Today´s situation is that the consultant can order purchases by his own decision, but the DAR project Director can *not*. We are here touching upon a difference in the mode of operation beteen BITS and old SIDA. Strangely enough we do not as yet have the answer as to which of the philosophies will prevail in new Sida. Perhaps both of the models will be allowed to coexist in the new organization. One or the other will be chosen depending on the special circumstances in each particular case. We are therefore not in a position to rule out the present arrangement as in-appropriate. We would simply draw the attention to this issue so that the donor in his dialogue with the recipient can agree on a mutually suitable arrangement in a future phase of the project.

Finding: Today´s situation is that the consultant can order purchases by his own decision, but the DAR project Director can not. This relates to a difference in the mode of operation between BITS and old SIDA, which needs to be discussed.

Another similar case, where one perhaps needs to review at least the wording of formal agreements, is regarding who controls the equipment purchased by the project. The contract states that *"goods and equipment, procured by Swedesurvey on behalf of the project, shall be at the disposal of Swedesurvey during the project implementation period, whereafter they will be turned over to DAR ownership, based on a hand-over inventory"* . In the current contract has also been added, so as to make it slightly more palatable: "Goods and equipment.....shall be deemed to be the property of DAR, *subject to it being used by Swedesurvey until the services are completed".*

Again, we are not prepared to rule out the above wordings as in-appropriate, but wish to remark that this is a wording which is probably not in accordance with the contract texts usually used by old SIDA. There the formal ownership and control by the Government was always very important, even though the actual practice of who does what and who controls what may not have been much different.

Related to this discussion, but obviousy of very small practical importance is the official name of the project which one sees displayed in letterheads and wall signs, namely - *"a joint project by DAR-Swedesurvey"*. The old, orthodox approach by SIDA was that a development project was always - at least in a formal sence - an integral part of the relevant Government

administration. No name should therefore be used which attributes part responsibility for, or ownership of, the project to a foreign partner, perhaps least of all a foreign commercial firm. According to this orthodox, perhaps conservative view, a foreign firm - as long as it does not invest equity capital of its own into the project - remains only a supplier of goods and services, nothing else.

Use of equipment

We have only seen one case in this project where the appropriateness of the use of procured equipment could be put in question. This is the use of and responsibility for a Toyota Land Cruiser, which according to the inventory list has been assigned to the Minister. We do not rule this out as inappropriate, but want to raise the question, since there is no obvious connection between DAR´s operational needs of a project vehicle and the tasks of the Minister´s office.

We were told by the consultant that, in retrospect, it would have been enough to purchase only one project vehicle to cover the needs of the project instead of the two that were purchased. He was also of the opinion that suitable vehicles of acceptable quality could have been purchased much cheaper in the local market than by importing them. We have no real basis to judge the merits of this argument. If it holds then we must consequently criticize the project for having failed to procure the most cost-efficient equipment from the most economical source available.

3. Results/outputs:

General

All the systems, as concerns both hardware and software, installed by Swedesurvey in the DAR central office, are working smoothly, and the staff running them are proficient enough to be able to train other staff of the provincial and municipal offices in running the same.

One may in summary say that the DAR central office today posesses a functioning computerized cadastral support system - consisting of GPS, APC, LIS and GIS - which is able to capture, encode, elaborate, process, present and print out text and graphic information, as well as maps in different scales. In general terms this was a project target already under phase II of the project, and has now been consolidated under phase III. Looking strictly at the text of agreements, one should therefore formally not include this as an achievement of the project´s latest phase. The practice is however different. It takes time for systems like this not only to be fully implemented, but often it will take even more time before they are fully established and operational. The proper conclusion to make would perhaps be that the target regarding

"achieving a fully operational system" during the project's second phase was too optimistically expressed.

Clear and operational user manuals have been produced for all of the sub-systems, and project documentation provided to me by DAR has been to-the-point and exhaustive.

Finding: All the systems, as concerns both hardware and software, installed by Swedesurvey in the DAR central office, are working smoothly, and the staff running them are proficient enough to be able to train other staff of the provincial and municipal offices in running the same. DAR central office today posesses a functioning computerized cadastral support system - consisting of GPS, APC, LIS and GIS - which is able to capture, encode, elaborate, process, present and print out text and graphic information, as well as maps in different scales.

Training

Judging by the familiarity with their tasks shown by the staff which I observed and which I interviewed, training has been quite effective.The operators were generally able to give answers to most questions regarding the contents and the capability of the various systems. They also seemed to be generally well informed about the CARP program, its purposes and its contents and its problems. One such operator told us that, after four weeks of coursework in Sweden, she felt confident as a user, but not yet fully confident as a systems administrator, e.g. in tasks such as adding new variables to the system.

The consultant has pointed out that the total number of staff trained to operate the various systems is relatively small making the system vulnerable to loss of manpower. Another aspect pointed out to us by the consultant is that the operational knowledge of how to run the systems is today vested mainly with the technical staff and only to a limited extent with the managerial staff. This neeeds to be remedied in the future so as to ensure the continued functioning of the system.

Regarding the length of training courses, the consultant feels that they have been a little on the long side, presumably because they subtract valuable time from other duties. This evaluation concurs with the opinion that workshops should in general be limited to no more than three working days.

The successful training in this project is probably at least partly due to the fact that almost all the staff in the relevant DAR department have a university level degree, and would therefore seem to be overqualified for their tasks. While this is obviously good for the project at present, it raises the question whether this staff will stay on their jobs when - and if - the currently depressed labour market in the Philippines for Civil and Industrial Engineers improves. So far the DAR-Swedesurvy special project department has not lost any personnel at all. Before being allowed to attend a training course the DAR staff must sign an agreement not to leave DAR within a two year period. Today however the excess supply in the Philippine labor market is a more binding restriction than this 2-year permancy clause.

The project advisor's comment with respect to the contention that the staff is overqualified for their tasks is that this is not so in perspective, as these operators are expected to later be promoted to systems officers and the like.

Finding: Training has been quite effective, but the total number of staff trained to operate the various systems is relatively small making the system vulnerable to loss of manpower. Almost all the staff have a university level degree, and would therefore seem to be overqualified for their tasks. While this is obviously good for the project at present, it raises the question whether this staff will stay on their jobs when - and if - the currently

Replication to DAR Regional offices

When it comes to *replicating* the system to the designated DAR regional, provincial and municipal offices, efforts are well under way, but there is still a way to go before the computerized system can be operational and independently run in the regional offices.

Many of the DAR central office staff visit the regional offices on a regular basis, and the staff of the regional offices are invited to courses and seminars in Manila. In addition to training the staff of the two pilot regions, it may be noted that DAR/Swedesurvey has also trained the personnel of five or six other regional offices.

Part of the surveying and mapping system, and the APC system have been implemented in the two pilot DAR regional offices. Likewise parts of the GIS and LIS have been implemented with the respective DAR provincial offices. Our visit to the two project areas in Mindanao revealed that the regional staff had a seemingly complete knowledge and understanding of the Cadastral support systems. They claim to be ready at present to use the system for their own regional and municipal needs.

In general the willingness to accept and adopt the new computerized methodology seems to be very high in the regional offices.They are however yet to receive the necessary computers and printers. There does not seem to be any particular reason why the equipment has not yet been installed. It is simlpy a matter of time. A little more time seems to be needed for procedures and routines to become established.

Finding: *Efforts of replicating the CSS system* to the two designated DAR regional, provincial and municipal offices, are under way, but there is still a way to go before a computerized system can be operational. They are yet to receive the necessary computers and printers.

Replication to other agencies participating in CARP

Also the objective of *integrating the cadastral support system with existing systems at other CARP-implementing agencies* has been addressed, and it

would seem that the DAR leadership is today aware of any existing or planned such system in other agencies. At present there is reported to be only one other agency - the DENR - which at some time attempted to introduce a similar system, but according to the DAR responsible Director, this attempt was not followed through. In his view DENR could increase its efficiency by some 60 % if they installed the GIS/LIS system that DAR has. DENR still today does not use computers to process survey returns. Also maps are drawn by hand. Some of the CARP-implementing agencies do not yet have any computerized system at all, and have to do all data processing manually. The Land Registry Authority, LRA, is one such agency. Several of the agencies have at one time or other expressed a wish to be allowed to use the DAR system.

There has not been time enough for this evaluation to verify exactly what each of the half dozen other CARP-implementing agencies today have by way of computerized geographical information systems. We do however have *general knowledge* of the existence of many - sometimes incompatible information systems spread over the agencies of the Philippine Government. This question is discussed at some length in Chapter V below.
Even though the DAR officers have made efforts in this respect, the time which they can usefully spend on the question of replication of its CSS to other agencies is obviously limited given the demands from other equally or more important objectives.

From the BITS decision memorandum it is not entirely clear what the objective of integration with other agencies actually means, for the memorandum also states that the objective should be to "present the new system (to other agencies) and explain its implications for their handling of data". If this second phrasing is valid, we can safely say that the objective *has* been achieved, because a number of presentations have been carried out by DAR-Swedesurvey for the benefit of personnel from other CARP-implementing agencies. If the former phrasing *(integrating)* is to be followed however, it becomes doubtful whether the objective has been achieved.

In the two follow-up reports that formed bases for BITS decision memorandum regarding phase III, the question of coordination through the Government's *Inter-Agency Technical Committee* is made out as a cornerstone of the whole project. If this ambition were to be used as a benchmark, one would have to conclude that the project has failed in the task of effectively coordinating installation of its systems with other relevant agencies.

Our overall impression - based on the discussion in chapter V below - is that the time and effort devoted by DAR-Swedesurvey to coordination and integration with computerized data systems of the other CARP-agencies has been adequate for *this* stage of the project, and given that the matter has been somewhat unclearly stated in the contract.

At the same time it is clear however that the question of coordination, compatability and integration must become much more important in

subsequent stages of this project. There are several reasons for this:

Firstly, every year more computerized information systems are introduced in an increasing number of agencies. So therefore, where coordination was not a pressing problem yesterday, it may well be so tomorrow.

Secondly, if one believes in the argument advanced above, that the existence of a computerized cadastral information system should be seen as an objective in itself, because it is a requirement of any modern society, then obviously coordination and integration become a *sine qua non.* For if such a system is not compatible on a national level, then one can not be said to have met the standards of a modern society.

Finding: The objective of *integrating the cadastral support system with existing systems at other CARP-implementing agencies* has been addressed, but it is not clear exactly what was intended by the donor. Depending on *how* the ambition is defined we find that the project has failed or succeeded in this task. The time which can usefully be spent on coordination with other agencies is limited, but it is clear that the issues of coordination, compatability and integration must become much more important in subsequent stages of this project.

Replication to other, non-CARP implementing agencies

Only limited efforts have been undertaken by the project to demonstrate and spread, or ensure compatibility with other agencies that are currently using a similar system, or who might be in need of one. This has not been required by the project's plan of operation, but the contention of this evaluation is, for reasons elaborated above, that the project's objective of spreading knowledge and use of the CSS system should include also non-CARP agencies to the extent that such agencies can have a realistic interest for such systems.

The topics of *replication* and *coordination* are discussed in chapter V below, where it is also pointed out that patent and ownership rules regarding the system softwares sometimes make coordination and integration with other users impossible to realize.

The view that coordination will become important in the future is shared by project management, who in the projec's final report state that:

"the overall dominating criteria for successful replication of the project depends on co-ordination between producers and consumers of the data. This for sure, could have been much more improved during the project period. Unless the problem of data formating and communication between different systems is addressed and resolved, problems will certainly arise and, in many cases, investments will be under-utilized. This issue must be solved at the highest - Undersecretary - level".

Finding: Only limited efforts have been made by the project to demonstrate and spread, or ensure compatibility with other non-CARP agencies. While this is *not* required by the project's plan of operation, the contention of this evaluation is however that it *should* also be an objective, because many other agencies are - or want to be - involved in similar GIS systems.

4. *Effects*

Facilitate and contribute to the implementation of CARP
There seems to be no question that the outputs produced by the CSS project noticably affect CARP implementation. In chapter I above we listed a number of CARP components which directly rely on computerized information support systems to be supplied by the CSS. The project's objective of facilitating the implementation of CARP is thus achieved.

An important*bottleneck* for implementing the part of CARP which consists in aquiring and distributing land to the beneficiaries of land reform (the other part being the extension and support services given to the new farmers) is the lack of funds and resources for the surveying work needed to define the new boundaries, as well the capacity to process this information in a computerized system. As my field visits revealed, the DAR regional offices often choose to distribute land by *collective ownership deeds*, rather than having to delay the land re-distribution process. This means that several - up to seven and sometimes more - new landowners must share one and the same deed, making it impossible to use their landownership as collateral for bank loans.

For the Government it is apparently important not to delay the land distribution process as the success of the entire CARP program is seen to depend on the momentum being kept up. It is not that the legal or political basis for the land distribution part of CARP can be changed. Because it is already promulgated in a law, which is not openly or directly being contested. However, an erosion of political and popular support for the land reform can have a negative effect by making it more difficult for the president to persuade congress to allocate the large funds needed for

a) undertaking the massive extension and support work which is seen as necessary conditions for the new landowners to become successful farmers, and

b) redeeming the 10-year government bonds which the former landowners today get as part payment for their nationalized land.

In the short term political factors are *not* a direct bottleneck to the implementation of the land redistribution targets, but political factors may sabotage the long run success of the land reform by decreasing chances that Congress will allocate necessary funds for the extension work and for the payment to the former landowners.

A direct bottleneck for the speedy execution of the targeted land redistributions are however the insufficient resources and capacity of DAR and of DENR to carry out the surveying and cadastral mapping work, without which no land aquisition nor land distribution can legally take place.

Finding: There seems to be no question that the outputs produced by the CSS project noticably affect CARP implementation. There are a number of CARP components which directly rely on computerized information support systems to be supplied by the CSS. The project's objective of facilitating the implementation of CARP is thus achieved.
A direct bottleneck for the speedy execution of the targeted land redistributions are the insufficient resources and capacity of DAR and of DENR to carry out surveying and cadastral mapping work, without which no land aquisition nor land distribution can legally take place.

Contribute to more effective work in other government agencies (CARP and non-CARP)

As was mentioned above, the CSS project can be justified also on other grounds than as a support to CARP. There are a number of other uses - especially in the long run - in the Philippines for a systematic and computerized data base like the one found in LIS and GIS of the CSS project. Examples of such uses are the planning of urbanization and infrastructure investments, such as schools, roads hospitals etc. Others are mentioned in chapter V below.

Contributing to more effective work of other - non-CARP-agencies is not a stated objective of this project, and I am not in a position to produce evidence that such an effect is actually taking place today. Given however the wide-spread need of computerized cadastral information systems in a modern society, I believe that there can be such a long-run effect, provided of course that the CSS project is implemented effectively and that the attainment of such an objective is included as a project target.

Develop and maintain a modern, computerized CSS in the Philippines

It can also be argued that the existence of a system like the CSS can be seen as an objective *in itself* for any modern society, given the many uses - economic and social - that such information may have.

Our conclusion then is that there are at the program/effects level three different justifications - each in its own right - for a CSS project (provided of course that the project is efficiently implemented):

- to facilitate the implementation of the Comprehensive Agrarian Reform Program
- to benefit other uses in society, and
- as an objective in itself to sérve the (future) needs of a modern society

Cost effectiveness

There are no data available which would permit calculation of cost effectiveness in quantitatve terms. We can however get a rough idea of effectiveness in qualitative terms by a reasoning of the following kind:

International consultancy services in the field of cadastral mapping and computerized information systems have in recent years become a very common feature in many developing countries as well as in virtually all of the so called *transition* economies of the former Soviet bloc. Swedesurvey itself is active in about 30 countries, of which 12 are in Asia. There is thus today an active international market place where these services are regularly offered and bought. One can therefore expect there to be a trend towards standardization of terms, type and character of services, and also of costs.

Even though many of these consultancy services are financed out of grant aid funds, which at least in the past were thought of not always being very exacting in its procurement, there seems to be today a trend towards more business-like procurement procedures for these types of services. This is increasingly true even for tied aid funds.

Moreover, many of the projects involving consultancy services in this field have been evaluated, making donors increasingly aware of what type of output and quality one may expect at a certain level of investment. Just recently, in the autumn of 1996, four other, similar, Sida projects - in Latvia, Lithuania, Estonia, and Russia - all involving Swedesurvey, were evaluated, and all found to have achieved their objectives in an effective way.

With this background information, if we are faced with project implementation which runs smoothly and with output achievements which are obviously operational, then we are also inclined to conclude that the results in this project has been achieved in a cost effective way.

Conclusion: Given the trend towards standardization of terms, character, as well as costs in the increasingly active international market for consultancy services in cadastral mapping techniques, procurement has grown more business-like in recent years. This seems to be true even for tied aid funds. In an efficiently run project like the one here, it can therefore reasonably be assumed that the results have been achieved in a cost effective way.

5. Impact: Attainment of long-run objectives;

The question to answer at this level is whether CARP is actually effective and instrumental in achieving national goals. In chapter I:4 above we found that the CARP is today in deed moving forward, and, although still running behind schedule, showing promising signs of being able to achieve the targets set. There are no evident signs suggesting that the program is today not implemented forcefully - given however the limitating factors in terms of funds and resources. We also found that - depending on the long-run overall objectives (economic, equality, political) of CARP - the program could well be improved by various modifications. The World Bank has, as described above, suggested concrete measures which would enhance the poverty alleviation effect of CARP.

In this section I will assess the long run impact of CARP in various aspects, mainly Sweden´s six overall development goals.

Political aspects

The big importance of land reform lies particiularly in its potential to achieve *social and political peace* in the country. Or, to put it bluntly, the effective implementation of the land reform program is by many seen as the only method devised which has a chance to pacify or neutralize the various guerilla movements, which by the late 1980s had grown quite active in at least three major areas of the country.

If a successful land reform can achieve social and political peace in the country, then we can also expect it to contribute significantly to the country´s long run development. Achieving social and political peace has in deed been forwarded by the Government as the main motive behind CARP. That this is not just official rethoric on part of the Government is evidenced by the actual reality in the field facing the local DAR officers executing aquisitions and distributions of land. Of the ones I met in Mindanao, at least a few said that they face threats of violance or worse. One of the municipal agrarian reform officers, who was my host in one of the settlements, reported that she herself, a few months ago, had been chased away by an armed squad of 50 men when entering a property which was to be aquisitioned from a large landowner. This land-owner, by the way, was reported to be the younger brother of the country´s Minister of Justice.

Conclusion: The land reform program is important for its potential to achieve *social and political peace* in the country. If this potential is realized we can also claim that it contributes significantly to the country´s long run development

Social and economic equality/ Poverty orientation

As for the objective of *economic and social equality*, which - as was mentioned above - is the only one identified in the BITS decision memorandum as being relevant for this project, we find it self-evident that any program which actually achieves land redistribution in the Philippines will fulfill the objective of equality.

A program which aims at taking land from the rich in order to give to the poor can safely be assumend to be addressing the issue of poverty alleviation. This holds even though, as in this case, the rich are paid for the aquisitioned land (near market rate, although paid only over 30 years), and even though the poor are paying for the land, which is done at a subsideized interest rate over a 30 year amortization period. Apart from the immediate net transfer of economic resources from rich to poor resulting from the land redistribution, there is an even more important longer term development effect, namely that hitherto landless peasants are integrated into the economy and given a constructive chance to improve their livelyhoods.

Conclusion: It is evident that a program which takes land from the rich in order to give to the poor will fulfill the objective of *decreasing inequality*.
If managed properly it is also likely to contribute to *poverty alleviation*.. This holds even though the rich are paid for the aquisitioned land, and even though the poor are paying (a subsideized price) for received land.

Economic growth (CBA mm)

When it comes however to the objective of promoting *economic growth* there is however a more mixed picture. It depends on the situation in each particular case, mainly on the type of land in question:

How was the land used before and how is it used after the the nationalization and redistribution? There are today in the Philippines no readily available studies which show the economic profitability of undertaking land reform. However, a major research task has been started to monitor incomes of the CARP beneficiaries by the University of the Philippines in collaboration with DAR, and this study may be able to provide some insight into the question in the future.

A relatively large share of the lands distributed so far has been Government owned lands, part of which were previously idle or used only little. So in these case we can expect agricultural output to be enhanced by the land reform. On the other hand, there are cases - I encountered one during my visit to Mindanao - where the land was nationalized on a compulsory basis

from a large landowner, who used the lands for a commercially successful large scale plantation type production, and where this land after the redistribution will be tilled by many small independent farmers/ settlers, some of which have little or no experience from agriculture, least of all from commercial type farming. In these cases we can safely assume that the country's economic growth (at least in the short run) will be hampered by the land reform measures.

In very general terms it would seem that most studies (around the world) on "the economics of land reform" come to the conclusion that a land reform based on more equal distribution of land can normally be expected to be economically advantageous for the country. A recent analytic survey of Latin America, as reported by IDB, gives support to this general finding.

Conclusion: With respect to the objective of promoting *economic growth* there is a mixed picture. It depends on the situation in each particular case, mainly on the type of land in question: How was the land used before and how is it used after the the nationalization and redistribution?

Base-line study

In the law on agricultural reform it is stipulated that DAR shall adopt a system of monitoring the performance or record of each Agrarian Reform Beneficiary (ARB), the purpose being to assess CARP's effectiveness in improving the quality of life of the ARBs on a continuing basis.
This work, which seems to have gotten under way somewhat belatedly, has, as was mentioned above, been entrusted to the University of the Philippines at Banos to be carried it out in collaboration with DAR.

In a paper dated July 8 1996 this monitoring system, as well as the results of a first base line study regarding socio-economic profile of the beneficiaries, is presented. This survey covered a nationally representative sample of 3411 ARB's randomly selected from 20 provinces using a stratified four stage sampling design. Some of its findings were:

The ARBs are generally aging, and are about 50 years old. Their average educational level is much lower than the national, as 73 % of them have not reached high school. Only 38 % belong to some kind of organization. 88% are actually involved in farming, either as primary or secondary occupation. Only 34 % own television sets as compared to a national average of 41%, while only 53 % have access to electricity, also less than the national average of 63%.

About 3 out of 4 perceived that their lives improved after being CARP beneficiaries. 77 % of them attributed this to CARP. Of these 89 % said that the improvement had been primarily due to the abolition of share tenancy, while the rest thought it was due mainly to the provision of support services

under CARP.

The average size of farms being cultivated by ARBs was found to be 1,85 ha compared to the national average of only 1,44 ha. 78 % of the ARBs were engaged in mono-cropping.

Data regarding land tenure showed that DAR still has a lot of unfinished business in terms of finalizing the distribution of the lands. Problems of land valuation, backlog of land surveying, and issuance of deeds were the causes of delays.

As regards the obligations of the ARBs, it was found that only 65 % are still tilling their lands, and of these as many as 24 % had violated one or more obligations, among them:

- mortgaging of land without title deed
- abandoning the land
- mortgaging of land rights
- subtenancy of land
- selling of land
- conversion of land
- surrendering of land to previous landowner
- giving land to relative
- taking land from other ARBs

The average productivity of the ARB farmers was the same as the national average, namely 2,9 metric tons per ha. Only 66 % of the ARBs received any kind of support services. Of those who did 96 % came from Government sources. 68 % had received support from DAR, 32 from local government, and 10 % from DPWH.

Only 30 % of the ARBs had access to credit, and of the credits received less than a third came from the formal credit sector such as banks or cooperatives, while fully 72 % came from informal sources such as money-lenders (23 %), traders (18 %), friends, relatives and neighbours (18 %). Of all borrowers 60 % said they had not posted collateral. Interest rates for informal loans were on the average 40 % and for formal an avarege of 28 %.

Only 26% of the farmers used any kind of farm machinery and 20% have adopted soil conservation measures. Income data showed that households derive more income from non-farm sources (55%) than from farm work (38%).

The incomes of the ARB households were found to be significantly lower than the national average. While the 1, 4 million ARB households constitute about 11 % of the the country´s total households, their income was oly 5 % of the nation´s total income. Exactly the same proportions were found for household expenditures.

Regarding expenditures the survey found that a "significant proportion of incomes are spent on vices i.e drinking, gambling, cigarettes etc.", without however disclosing the actual figure.

The survey also found that many ARBs are prevented from starting to pay their amortizations for the land because of pending protests in court submitted by the land-owners.

The survey's finding that ARB household are significantly worse off than other households in the country prompted the researchers to conclude that it was now time to emphasize infrastructure support and extension work of CARP, and not as hitherto mainly the land redistribution part.

Finding: A recent survey of CARP benèficiaries revealed that about 75 % perceived that their lives improved after being CARP beneficiaries. 77 % of them attributed this to CARP. Of these 89 % said that the improvement had been primarily due to the abolition of share tenancy, while the rest thought it was due mainly to the provision of support services under CARP.
-Income data showed that households derive more income from non-farm sources (55%) than from farm work (38%). The incomes of the ARB households were found to be significantly lower than the national average.

Democratization

The objective *enhancing democratic development,* we can normally expect to be served when masses of former landless people become self-employed farmers, and thereby presumably get a bigger stake, as well as a bigger say in local government. On the other hand, it has been noted, eg. in some of the Government documents, that a too radical or violent land refom may be counter-productive by antagonizing conservative groups and creating polarization in society. If this were to happen then we would conclude that the *democracy* objective is not served.

Conclusion: The objective of *enhancing democratic development,* we can normally expect to be served when masses of former landless people become self-employed farmers, and thereby presumably get a bigger stake, as well as a bigger say in local government

Independence

There would seem to be no direct connection between the impact of CARP and the furthering of national goals regarding economic and/or political independence.

Environment

The *environmental* objective can *a priori* not be automatically associated with a land reform program. The effect in terms of environment would naturally depend on what type of production, using what methods, will take place after redistribution as compared to before land reform.

As concerns, however, uses of a CSS system for other purposes than land

reform, e.g. different types of physical plannig, we can in general expect that programs and activities that rely on a good CSS in its planning would be more environmental friendly than programs which are not based on systematic computerized land use and geographical data.

Gender

In the targets and objectives set for the cadastral support systems project and for the CARP there is nothing which explicitly would have any (direct) effect on gender equality. In practice however there may be such an effect, albeit very indirecty, in the not so unlikely event that the DAR officers in the field are influenced by gender perspectives in their work of e.g. assigning beneficiaries for different lands.

Sustainability

One of many factors to consider in the pursuit of buiding up a sustainable project is to integrate it as much as possible with the regular organization of the agency in question. In this project a special unit has been set up within DAR, which is partly understandable since it is a special project being undertaken. But care must be taken so that special privileges in relation to other departments in terms of budget allocation and salaries etc are not mounted. Because such privileges will be difficult to sustain after the foreign donor withdraws his financing, making it difficult for the project to keep up its activities.

The project advisor has pointed out that in order to become sustainable in its opreation it is important that the system with its data bases is introduced in central positions where it can be accessed by all concerned user agencies.
An important factor in ensuring the project´s sustainability is obviously also to emphasise coordination with other users so as to avoid duplication and incompatibility.

IV SATELLITE MAPPING OF NATURAL RESOURCES

1. Goal hierarchy/the logical framework

The output targets of this project were

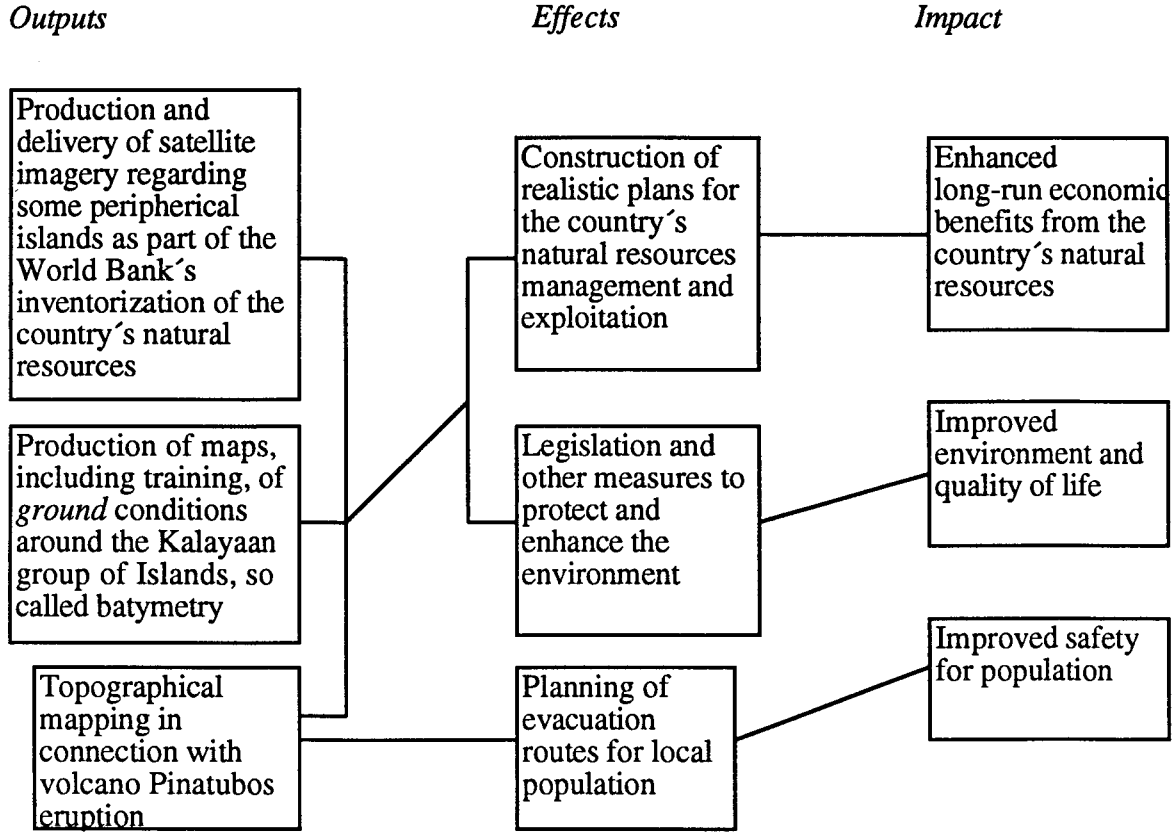
(1) Production of satellite imagery in the scale 1:50,000 of some peripherical islands in the country's south and north archipelagos. This was in completion of the satellite imagery produced for the World Bank's inventorization of the country's natural resources condition in 1987/88. The reason why these islands were left out from the original project was that the scale 1:250,000, which was used in the mapping for the World Bank study, would have been meaningless in the outlying island as the maps would then mainly show just water.

(2) Satellite mapping of the effects of the volcanic eruption of Mount Pinatubo on the surrounding areas. NAMRIA wished to compare photos taken of the area before the eruption with photos taken afterwards in order to determine the damage on the vegetation etc. By using topographic mapping it would also be possible to predict probable routes of future lava streams, and thus allow the planning of evacuation routes for the local population.

(3) Practical training and map production regarding bottom conditions, so called *bathymetry*, around the Kalayaan group of islands, based on black and white spot data. This is an important area because it has very sensitive coral reefs while at the same time having busy sea traffic. There is also a likelyhood of massive oil deposits being found. Furthermore, NAMRIA needs mapping of the conditions of the sea bottom in order to be able to fight the practice of fishing by explosives. Bathymetric maps can also serve as bases for the production of maritime maps, just as it can facilitate the marking of sea routes.

The targets of the different levels of the goal hierarchy is shown in the following figure 4.

Figure 4: Goal hierarchy of the Satellite mapping of natural resources project



2. *Implementation*

According to the project plan the consultant receives the satellite images in the space station in Kiruna. Then delivers the imagery to NAMRIA in the form of digital data tapes, paper copies, dia positive slides and transparent film - all needed for NAMRIA´s further processing of the imagery. The initial stages of the interpretation and the data processing work was carried out in Sweden, and subsequently finalized by NAMRIA´s own experts in the Philippines. Practical training in underwater mapping was to be performed both in Sweden and in the Philippines, but this part of the project was scrapped.

Contrary to what was the case in phase I of the project, this time NAMRIA

assumed the main responsibility for the interpretation and processing work, applying the knowledge they had aquired in the first phase through on-the-job training, when the corresponding tasks were mainly carried out by Swedish personell in Sweden, but assisted by a few NAMRIA experts/trainees. This work has according to NAMRIA´s responsible officers so far proceeded smoothly.

In the beginning of 1996 NAMRIA received a cd-ROM with the satellite imagery and is now engaged in producing small 1:250,000 scale maps based on the supplied data.

The project activities were implemented efficiently and according to plan, and the characterization of NAMRIA as *"a competent, modern and fully eqipped work place for remote sensing"*, which was made by the 1992 evaluation mission, would seem to be applicable also today. According to NAMRIA´s officers interviewed the foundation was laid during the first phase of the project, and since then a partial and balanced up-grading of needed soft-wares and some hardware has been undertaken.

The printing and plotting of the products derived form the satellite imagery remains an important part of NAMRIA´s work since most of its clients want maps on paper rather than computer tapes.

Finding: The project activities were implemented efficiently and according to plan, and the characterization of NAMRIA as "a competent, modern and fully eqipped work place for remote sensing", which was made by the 1992 evaluation mission, would seem to be applicable also today. According to NAMRIA´s officers interviewed the foundation was laid during the first phase of the project, and since then a partial and balanced up-grading of needed soft-wares and some hardware has been undertaken.

In the contract agreement (for Phase III; 8 May 1992) between NAMRIA and SSC there is a clause stating that "The client shall not duplicate the product originals for distribution or sale outside its organization". A corresponding clause was also contained in the contract signed 20 August, 1988 between NAMRIA and SSC, stipulating that "The client shall not duplicate the transparent map originals for distribution or sale of transparencies outside its organization".

We assume that these clauses are standard practices in the international trade of satellite imagery, and we have no basis to rule them out as improper. But nevertheless one must ask how such a clause can possibly be compatible with the donor´s explicit wish that the technology transfer to NAMRIA shall to the largest possible extent be *replicated* to other agencies. We were subsequently informed that this clause refers only to sale to the private sector since the word "client" is defined as *all* Government agencies. If this is so it should be explicitly stated in the contract in order to avoid possible confusion.

It turned out impossible to secure the water data around the Calayaan island group, and the bathymetry part of the project was therefore not posssible to carry out. By mutual understanding between NAMRIA and the consultant the project scope was therefore decreased, and only 1,17 MSEK, out of the contracted 1,62 MSEK, were paid out. Two thirds of the decrease of 451,640 SEK was due to only ten SPOT/PAN scenes being delivered, compared to the twenty that were originally planned, and the remaining third was due to the deletion of the bathmetry part of the project, which would have been based on the PAN imagery.

NAMRIA today works with three other foreign aid donors - Australia in the remote sensing center, Japan in coast and geodetical surveys (softwares and purchase of surveying equipments), and Germany (GTZ) in training and transfer of technology and supply of all of NAMRIA´s photogrammetric equipment.

3. *Results/outputs*

All the output targets, given the agreed down-sizing of the project scope, were achieved.

A problem remaining from the earlier phases of the project is that NAMRIA is not allowed to charge its clients the full actual cost of the maps that it supplies. It is allowed to charge the recurrent part only, but no overheads to cover salaries of its staff, depreciation on buildings etc. This means not only that its clients enjoy a substantial hidden state subsidy, but also that NAMRIA is deprived of an incentive to spread its maps and services, thus preventing a sound market situation to develop. As regards services supplied, i. e. other sales than maps, NAMRIA is allowed to include depreciation charges for its investment in computors.

A few years ago NAMRIA was given permission to operate a revolving fund for its commercial activities, but this right was later revoked. Today NAMRIA is again requesting the right from the government to have the same financial independence. A Congress bill regarding NAMRIA´s financial autonomy is currently being processed and has passed several readings both in the Congress and in the Senate. This bill, if it is adopted, will ensure greater financial autonomy to NAMRIA and allow it to apply full-cost pricing in its map distibution and also allow it to sell off some assets. It would make NAMRIA a semi-private public corporation receiving from the national budget appropriations only to cover its salaries.

Chances that the bill will be adopted are today considered very good. It is however being opposed by the Philippine weather bureau which worries that NAMRIA might take over some of its functions, and also that the satellite

pictures it needs for wheather forecasting will be too highly priced. Also the Country´s finance ministry has questioned the proposed right to sell off some of NAMRIA´s asssets.

Finding: All the output targets, given the agreed down-sizing of the project scope, were achieved with out any problems.A problem remaining from the earlier phases of the project is that NAMRIA is not allowed to charge its clients the full actual cost of the maps that it supplies. This means not only that its clients enjoy a substantial hidden state subsidy, but also that NAMRIA is deprived of an incentive to spread its maps and services, thus preventing a sound market situation to develop

Another distorting factor in NAMRIA´s work is that, just like most other users of foreign aid grants, it is not forced to pay counterpart payments for its use of aid grants. The implication of this is that NAMRIA receives a state subsidy which goes unrecorded, thereby obscuring the economic and financial viability of its operations

Spreading of results and methodologies to other users

In its own opinion NAMRIA has not yet done enough by way of spreading knowledge and awareness of its maps among potential interested parties within and outside the Government. This question is further discussed below in chapter V, where we also address the important risk of duplication of effort and incompatible systems being mounted in different parts of the Government.

Cost effectiveness

The supply side of the market for satellite imagery is very limited as there are few suppliers who can offer the desired resolution. The international price of satellite data is standardized; in fact all satellite data cost the same. So in the competition between different suppliers it is the quality and price of the surrounding services offered by the consulting company which is decisive for the procurement decision.

DENR´s responsible Director claims that DENR has sufficient experience in comparing quality and cost of different international suppliers of satellite images and surrounding services: "We know roughly what time is needed to perform various services, and the proper international rates for them." The reason DENR chose Swedish Satellitbild is thus not only because there was a BITS grant available for Swedish services. Even if the aid funds in question were untied they would for this procurement still have chosen Satellitbild.

In procuring consultancy services, DENR is very cost conscious. It negotiates actively and scrutinizes contract proposals even if the projects are to be financed out of tied grant aid. If DENR is not satisfied with the service it is getting it will ask for replacement. During the entire three phases of the SSC project this has however only happended once, and then only regarding a relatively minor detail.

Finding: The international price of satellite data is standardized, so in the competition between suppliers it is the quality and price of the surrounding services offered which are decisive. DENR sees itself as a cost conscious procurer of services. Even if the aid funds in question had been untied it would for this procurement still have chosen Satellitbild

4. Effects

The conclusion reached by the 1992 evaluation of the main part of the Satellitebild project with NAMRIA was that the aquired satellite imagery "had without doubt rendered considerable net benefit to the Philippines", and that it had resulted - directly or indirectly - in many initiatives, including pieces of legislation, aimed at protecting or enhancing the environment. Our analysis of this remaining part of the project - the phase III - does not lead us to any different view regarding the project´s overall effects.

There are also some new examples of such initiatives, that can be cited. In a memorandum sent from NAMRIA to BITS in 1993 are listed39 projects - internal as well as external - where the SSC SPOT mapping outputs were being used, and another list of 53 agencies or institutions which had or were making use of the SSC SPOT mapping projects outputs.

It is also reported that the success of the SSC project in detecting large - hitherto unknown - environmnetal problems, has had important international repurcussions in that it helped create awareness of potential environmental problems also in some neighbouring countries.

One of the main uses of the output from the satellite imagery is for the *National Land Use plan,* and its sub-system plan the *National PhysicalFramework Plan* under the responsibilities of NEDA and DENR. Another very important specific use is for the preparation of a *National Master Plan for Forestry*, which has however not yet started. NAMRIA also supplies DAR with large scale mapping of CARP settlement areas.

During the 1990 earthquake and the Mount Pinatubo volcanic eruption, the project´s satellite data provided the baseline information for assessing damages on the environment.

The fact that SSC had waived royalty payment for the supplied satellite imagery has allowed NAMRIA to distribute freely the SSC products and charge only for reproduction cost.

To sum up, the project has had its desired *effects* regarding all the targets listed in the project´s goal hierarchy: It has facilitated *the construction of realistic plans for the country´s natural resources management and*

exploitation, and *legislation and other measures to protect and enhance the environment* as well as facilitated the *planning of evacuation routes for the local population.*

Finding: All the effects listed in the project's goal hierarchy have been realized: Project outputs have facilitated *the construction of realistic plans for the country's natural resources management and exploitation;* and for *legislation and other measures to protect and enhance the environment.* It has also facilitated the *planning of evacuation routes for the local population*

5. *Impact*

Given the many applications of the project results in legislation and other initiatives aiming at improving both natural resources mangement in general and environmental protection and enhancement in particular, we can assume that the project has in deed had a beneficial impact in **protecting and enhancing the environment**. The clearest example of this is perhaps the legislation banning certain types of logging in order to protect the country's virgin forests, which is reported to have come about as a direct result of the satellite imagery supplied by the project.

However one can not be sure that reports regarding environmental degradation sent by DENR to the Government will always be heeded. As the responsible Director told me: "We can only expose the situation to the politicians. Then it is up to them to act ."

Conclusion: Given the many applications of the project results in legislation and other initiatives aiming at improving both natural resources mangement in general and environmental protection and enhancenment in particular, we can assume that the project has in deed had a beneficial impact in **protecting and enhancing the environment**. The clearest example of this is perhaps the legislation banning certain types of logging in order to protect the country's virgin forests, which is reported to have come about as a direct result of the satellite imagery supplied by the project.

By virtue of the many uses that have been made of the satellite imagery we can likewise assume that there has been a beneficial impact on the country's ability to derive higher **long run economic benefts** from its exploitation of the nation's natural resources.

Conclusion: By virtue of the many uses that have been made of the satellite imagery we can assume that there has been a beneficial impact on the country's ability to derive higher **long run economic benefts** from its exploitation of the nation's natural resources.

As for the mapping which was done specifically regarding the Mount Pinatubo volcanic eruption the project output could be used to plan evacuation routes in case of another future catastrophe situation, and we can thus conclude that the project has also had the impact of providing **increased security** for the people living in that zone.

As for the project's impact on social and economic **equality** or poverty alleviation, there are no such impacts evident, although a recent World Bank publication actually claims that there is in the Philippines a strong correlation betweeen measures that will protect the environment and povety alleviation. In the avbove cited recent World Bank report on *Public Expenditure Management* the authors thus claim that:

"Most of natural resource management projects being implemented in the country have a direct poverty allevialtoion focus and benefit the poorest of the poor: the upland dwellers. Increasing public expenditure on natural resource management projects and programs would, therefore, achieve the dual benefit of poverty alleviation and sustainable resources management."

The claim is however not further explored or explained.

Regarding the other overall goals of Sweden's development asistance - gender, independence, and democratization, we can not see them as being relevant in this project.

Sustainability/relevance

By addressing a strongly felt need which can be immediately satisfied by the project's demand-driven output, it would seem that the project is in deed *relevant*. And by NAMRIA having built its own in-house capacity to interpret and process received satellite imagery, the project results have a good chance of becoming *self-sustainable*.

The degree of self-sustainability does not seem to depend on a country possessing its own receiving station, since the imagery can always be purchased without any restrictions in the international market. Investing into one's own national satellite receiving station is mainly a question of economic feasibility. The Philippine government is presently contemplating to invest into and install its own receiving station, so as to avoid having to pay for receiving satellite images from Sweden or elsewhere. There are however doubts whether such an investment would be a good proposition economically.

Southeast Asia is today reported to have the World's most overlapping network of satellite receiving stations, many of them installed mainly for nationalistic reasons rather than economic ones.

Conclusion: NAMRIA having built its own in-house capacity to interpret and process received satellite imagery, the project today has a good chance of becoming *self-sustainable*.

V COMPATIBILITY BETWEEN GEOGRAPHIC SYSTEMS OF DIFFERENT AGENCIES: COORDINATION EFFORTS

Geographical Information Systems, GIS, are used for analyses of basic information for a number of applications such as land consolidation, land use planning, land valuation, urban development planning, environmental protection and management of agriculture, forestry, and public utility systems as water and sewerage, telephone, electricity, district heating systems etc. In a modern society relying increasingly on computerized systems for an increasing number of vital functions it becomes very important that newly introduced systems are coordinated so as to provide compatibility.

GIS has been used in the Philippines from 1970, and since then perhaps as many as 40 different agencies have introduced its own GIS data base. But, according to James Dexter A. Grageda, a former Division Chief of NAMRIA, very little coordination exists between them. This is the way he sums up the situation in *GIS LINK* (Volume III No 1, November 1996):

"Up to now, however, there still does not exist a national system that interlinks geo-information available in different government departments and private offices;... There are plenty of GIS to choose from, but a standard data set from which all these systems can relate, interlink and share data is still unavailable"

Finding: GIS has been used in the Philippines from 1970, and since then perhaps as many as 40 different agencies have introduced its own GIS data base.
But there still does not exist a national system that interlinks geo-information available in different government departments and private offices. There are plenty of GIS to choose from, but a standard data set from which all these systems can relate, interlink and share data is still unavailable

Many agencies today produce maps for their different individual needs choosing different scales and projections. Little or no coordination has taken place and there is today a proliferation of different systems and coverages of similar data. This seems to be true not least in the area of land data.

An officer from the Governments Land Registration Authority, LRA, recently described the country's land records to be

"in a dismal state of management. They are being kept and maintained by different departments in the bureaucracy;..... in locating records a person who is not familiar with the existing land records system will certainly experience extraordinary hardship." (Article by Felino M. Cortes of LRA in *GIS LINK*, Newsletter of the IATFG, VolII No 1, June 1995).

This state of affairs has developed in spite of DENR in 1990 having issued an order "establishing survey standard instrumentation and procedurs in the verification and approval of maps " in order to meet the "ever increasing demands for varied land maps in the implementation of CARP and other." (Source: Undated memorandum of NAMRIA)

Finding: Many agencies today produce maps for their different individual needs choosing different scales and projections. Little or no coordination has taken place and there is today a proliferation of different systems and coverages of similar data. This seems to be true not least in the area of land data

At a very early stage of this evaluation it was clear that any future aid programs in this field should also address the coordination/compatibility issue between the different government agencies, and this is proposed below in chapter VI. I thus see coordination as a very central issue, and I will discuss it at some length.

The problem of coordination has certainly been realized by the Philippine Government, and some initiatives have been taken to address the problem, the most tangible being the creation of the *Inter agency Task Force on Geographical Information,* so far however without any forceful implementation.

The donors seem to have mainly given lip service to this problem. One serious and ambitious first step to rectify the situation,(which has however not been followed up) was taken by BITS in late 1994 in commissioning a study mission with the purpose of designing a master plan for the development of a GIS infrastructure at DENR.This initiative is briefly discussed below.

Finding: Some initiatives have been taken to address the problem, the most tangible being the creation of the *Inter agency Task Force on Geographical Information*, so far however without any forceful implementation. The donors seem to have mainly given lip service to this problem.

By a Memorandum order issued by the National Statistics Coordination Board in 1993 an *Inter-Agency Task Force on Geographic Information* (IATFGI)

with 5 technical working groups (TWG) was created.
The purpose of this Task force, which is run by and within NAMRIA, is to *"develop and recommend minimum standards for geographic information system interchange, and standard methodologies and concepts and definitions for universal adoption by all Government agencies in the generation of geographic information"*. No doubt a gigantic task, but nevertheless a minimum requirement for any modern government.

The founding document states that "the proliferation of geographic information projects in the Govenment necessitates the establishment of standards and coordination mechanisms in order to optimize the use of resources", and emphasizes the importance of "ensuring compatibility of hardware/software to facilitate exchange of data, avoiding duplication of efforts such as similar projects covering the same subsequent generation of inconsistent data sets." It also points out the need to monitor the financial resources being invested so as to avoid over-spending and unnecessary use of resources.

The members of the IATFGI are nine Government agencies - among them *not* DAR - with NAMRIA in the chair. Also represented is the influential National Economic Development Authority (NEDA).The five working groups are respectively on

- Agriculture, Environment and Natural Resources
- Lands and Surveys
- Infrastructure and utilities
- Socio-economic aspects
- Research, training and Technology

The membership of the working groups varies according to the relevance of different agencies for the respective topics. DAR is naturally represented on the Land and Surveys working group, as is also NAMRIA, but curiously enough not DENR, although it is - measured by the size of land distributed - actually the largest actor in the Agrarian Reform Program.

Although strongly lacking in political clout and mandate to enforce its recommendations, the *Task Force* has approached its task with energy and determination. Its chair-person today diplomatically characterizes the situation such that "there is some cooperation between different Government agencies, but there is definitely room for much improvement". She also discloses that it is quite difficult to get information from other Government agencies given that the Task Force has no mandate to force other agencies to cooperate. To a large extent, she says, it is a matter of exploiting personal contacts. Most of the representatves do come to the IATFGI meeings out of "love and devotion for their work".

A factor which today works in favour of increased compatibility is that most who today go into GIS development in the Philippines will usually pay a visit to NAMRIA, thus giving NAMRIA a chance to sound the alarm if any

duplication of effeort or incompatibily is suspected.

After its first nine months of operation IATFGI circulated a memorandum in 1995 highlighting the following accomplishments of the 5 working groups:

- Issuing of recommendations regarding standards in the form of *"IATFGI resolution No X"*

- Inventory of GIS projects and holdings. This is a computerized inventory made in 1993 of what DAR, DENR and NEDA have by way of
(1) Geographical Information Projects/activities, and
(2) Spatial digital Data holdings
The former, which is sorted by department/agency, nature of application, and by project status, shows that the Dept of Agr (DA) had 18 different GIS projects on soils, land management units etc, and that DENR had six, of which three were in NAMRIA. DAR/CARP is not listed so the listing is obviously far from complete. (2) lists some 240 different geographical digital data bases at DA, NAMRIA, and at NEDA all of them using ARC/INFO

- An inventory of GIS Hardware and software, which was said to be 50 % complete

- Evaluation of GIS software and data

- Publication of the IATFGI newsletter. Only a handful of issues have appeared so far, but holds much in promise as it is very well edited with short and popular but qualitative articles and news items.

- Archiving of GIS materials

- Data clasification

- Copywriting of digital data. An agency which has produced and owns a particular GIS data base has spent considerable time and effort in this work and must be assured that its rights are protected This is a prerequisite in order to persuade the agencies to collaborate more in data sharing.

- Copywriting and/or Software licensing

- Data security. No agency shall have the right to alter another agency´s digital data

- GIS data standardization. Because of inconsistencies in the coding used by agencies it is often difficult to merge different data bases.

- Socio-economic questions: Efforts to streamline the data and their

classification of socio-economic information gathered by many agencies

- Training requirements of agencies: Pooling of some training activities as well as sharing trainers and lecturers with others

As its main problems the 1995 memorandum states
- Devising ways to motivate agencies to participate in the activities and to abide by the rules issued by the IATFGI.
- Lack of funds to support various member agency activities in e g training and research
- Lack of resources to be able to effectively pursue the objectives of the Task Force.

In the beginning of 1996, IATFGI issued and distributed to its members a 300 page *"Manual of Standard GIS Data Classifications and Definitions"*, which for 30 areas/topics, including land use, publishes the classifications and definitions that the Task Force has arrived at. For each definition the manual also provide the source of the definition. This source could vary, from a legislative bill or a ministerial decree to a regulation or some convention, more or less formal, or a definition informally adopted in a Task Force work shop. This manual is now to be tried outin practice for 6 months before being formally adopted.

As can be seen these are activities of coordination which could be important and relevant in order to secure compatibility between different agencies and donor projects, not least the two Swedish-financed projects evaluated in this report.

Unfortunately the practical result in terms of dissemination to and compliance by other agencies so far of the Task Force´s work seems to be at best modest, something which in this evaluators opinion is more attributable to IATFGI´s lack of political and financial backing rather than lack of knowledge or determination on part of the people behind the Task Force.

One of the reasons why the Task force has not been more influential up to now may well be the fact that no foreign aid donor has chosen to give active support to this Task Force. Such support would not necessarily, nor primarily, have to be by financing its operations. Perhaps more effective would be for a donor to demand implementation of and compliance with some of theTask Force´s recommendations as a pre-condition for giving financial support to projects under the agencies involved.

Conclusion: One of the reasons why the Task force has not been more influential up to now may well be the fact that no foreign aid donor has chosen to give active support to this Task Force. Such support would not necessarily, nor primarily, have to be by financing its operations. Perhaps more effective would be for a donor to demand implementation of and compliance with some of theTask Force´s recommendations as a pre-condition for giving financial support to projects under the agencies involved.

As of today the IATFGI only exists as a committee, which means that all the work is done by the members on top of their ordinary tasks in each one´s respective agency. According to plan the Task Force meets every quarter, but in practice only twice a year. The working groups, however, convene every month. Looking at how the question of data compatibility has been solved in other countries there is much to be said for an institutionalization of the IAFTGI, at the very least providing it with a secretariate with a few full time employed experts. The feasibility of such institutionalization should be studied and if found realistic, it might appear to be an attractive object of donor financing. Its importance would in deed be very strategic and with a high "multiplier effect".

As was mentioned above recently a legislative bill (no 5516) has been introduced in the Congress which aims at "modernizing NAMRIA to a level where it can effectively and fully perform its mandate to act as the central surveying and mapping agency of the country". One of the purposes of this bill is also to "further the task of eliminating data duplication and promoting data sharing and exchange of data between government agencies". This bill also contains a proposal to establish an earth receiving station for satellite signals, which is obviously a very far reaching proposal with implications, among other things, for the future cooperation between NAMRIA and SSC.

Another politically more powerful commitee, with a much broader mandate is the "National Land Use Committee," NLUC, run by NEDA. The chairperson of IATFGI is also a member of this committee, but otherwise there is no cooperation between the two. DAR is also a member of the NLUC. According to one source NLUC in 1988 undertook a study on GIS coordination, but we have no further information on this study.

At present IATFGI channels some its INITIATIVES through the National Statistics Coordination Board, NSCB, which is also under NEDA. Unlike the NLUC this committee has its own secretariate - consisting of about 100 persons. Recently the NSCB has also formed a working group on Land Use Information Systems. For the future it should be discussed whether it may perhaps be more fruitful for the IATFGI to work through the NLUC instead of (only) through the NSCB.

Another actor in the coordination fo different GIS-systems is, or should be, the relevant sector department of NEDA, which is responsible for planning and coordinating all donor-assisted projects in the Philippines.

There is also a "committee on space technology applications" which overlooks among other things satellite mapping, remote sencing etc.

Swedish study mission on GIS coordination in 1994

A Swedish study mission on GIS-coordination, which visited the Philippines in 1994, suggessted a major project to be undertaken in collaboration between Swedish consultants and DENR/NAMRIA with a view to developingto a master plan for all GIS infrasturcture at DENR.

This mission noted that the creation of IATFGI shows that there is a pronounced awareness in the Philippine Government of the problem of coordination and also an ability to define the needs. It pointed out emphatically that the IAFTGI is a very important tool for the coordination and consolidation of current GIS activities, and that it is essential that this Task Force receive continuous support and that it be provided with adequate resources for its future work.

The mission also proposed that a "clearing-house" be established where a user can find information concerning what data is available for certain tasks. IATFGI´s comment today to this proposal, which as far as we know has not been followed up either by the donor or by anybody in the Philippine Government, is that this would have to be by way of computer *networking*, because it is not feasible to "take away" data from other agencies and have one agency, namely NAMRIA, be responsible for all of it. NAMRIA today already has a home-page on Internet which could be used to access such a network, and which could also be used for downloading desired data.

The Swedish study noted that the IAFTGI had already discussed almost all of the topics included in the terms-of-reference of the Swedish study, prompting it to cut down on the scope of its proposal for a future study project.

After producing a mission report, including a detailed proposal on how to proceed, the BITS-report does not seem to have raised much attention. It is not clear why, but there are a few points which might explain.

Firstly, although very thorough, and apparently very relevant, the report was by some seen as an academic exercise, and has, perhaps for that reason, so far not been widely read by the relevant Philippine agencies.

Secondly, and perhaps more importantly, the donor BITS has apparently not followed up on its own initiative to address the issue of GIS-coordination. A suitable opportunity to do so would appear to be in connection with the discussions to finance additional phases of the two programs evaluated here. One of the general experiences from development cooperation is that the best - some would say the *only* - chance that a donor has to promote coordination between different ministries and agencies is as a side condition attached to the financing of more regular project activities.

VI SWEDEN'S AID PROFILE

1. Criteria for Sweden's aid to the Philippines

The objectives and the criteria for Sweden's aid to the Philippines have recently been discussed and formulated in Sida's new country strategy. It states that the "main objective shall be to contribute to improving the conditions for poverty alleviation". By doing so environmental, human rights and democratization aspects are to be emphasized. Given the uneven distribution of income in the country it is particulaly important to give support to those processes which benefit the poorest segments and the poorest regions. In designing the strategy it must be taken account of the fact that the Philippines is not a program country of Sweden's aid, and that Sweden has a relatively minor role as donor.This circumstance should influence the choice of projects as well as mode of operation.

The development cooperation should be designed so as to maximize the exhange between the two countries in the economic and other spheres. Transfer of Swedish experience and knowledge of use for Philippine development shall be an imporant ingredient.The development cooperation shall mainly be in the form of *contract financed technical assistance*. In order to maximize long run effect support can be given to several phases of a program, implying that support is given to a limited number of concentration areas over several years.

The Philippines is a competent development partner, and experiences so far are good. Preparation of proposals for new projects should continue to be the responsibility of the Philippino part, which should also finance part of the projects. The Philippines, although trailing many of its Asian neighbours in income level, has a much higher per capita income than Sidas program countries. The country is also receiving relatively large sums of aid from Japan. The transfer of financial resources shall therefore not be the main object of the Sweden's aid. The aid must not become a substitute for internal mobilization of resources.

2. Suitability of the computerized cadastral support and satellite mapping projects

The two projects evaluated here - cadastral support services and satellite mapping - both seem to fulfill most of the criteria posed by the Swedish aid strategy. They are aimed at benefitting environmental protection and poverty alleviation respectively. They are both very much geared towards the transfer

of particular Swedish experience and knowledge which can be put to good use in the Philippines, and they are implemented by way of contract financed technical assistance.

Given that these projects have been evaluated and found to have performed well so far, they would both seem to be obvious candidates for continued Swedish financing.

The proposals submitted to Sida for additional phases of these two projects both seem to emphasize the transfer of knowledge aspect, rather than the transfer of resources.

In the cadastral support services project there will be a continued need for technical assistance as the project will move from replication in two pilot regions to a massive spread of computerized cadastral support systems in the entire country. The project advisor has pointed out that it is a much more difficult task in all respects, including technological, to undertake nationwide replication as compared to spreading the techniques to a few settlements in two regions. Apart from the massive financial resources needed to achieve a national spread - much of it will presumably have to be financed by the government's own resources - a continued need for external advise can be expected.

A similar situation seems to be the case in the Satellite mapping project. In the next phase important activities, such as data processing etc., will be performed by the recipient's own staff and on his own premises, while being assisted by the external consultant mainly through on-the-job training.
According to NAMRIA the organization still needs to further enhance its competence in order to become self sufficient and sustainable.

Conclusion: The two projects evaluated here - cadastral support services and satellite mapping - both seem to fulfill most of the criteria posed by the Swedish aid strategy. They are aimed at benefitting environmental protection and poverty alleviation respectively. They are both geared towards the transfer of particular Swedish experience and knowledge, which can be put to good use in the Philippines, and they are implemented by way of contract financed technical assistance. Given that these projects have been evaluated and found to have performed well so far, they would both seem to be obvious candidates for continued Swedish financing.

Finding: The proposals submitted to Sida for additional phases of these two projects both seem to emphasize the transfer of knowledge aspect, rather than the transfer of resources.

3. "Cathalytic" aid

Both of these projects can also be said to belong to the category "cathalytic" or strategic in the sence that they represent areas where the donor can, in the present stage of Philippine economic development, "make a difference" with its aid program. This is in contrast to projects like e.g. promoting small-scale business etc, which is an area where Philippinos themselves possess considerable knowhow and talent.

The Philippine government is today, after having been very interventionist (and authoritarian) for about two decades, pressured by a domestic as well as international opinion to withdraw its positions and let private industry play a much bigger role. This is also the professed philosophy of the Government itself. While we can thus see a welcome development of the Government playing a more modest role in relation to a growing private sector, we do not wish to see it "loose its teeth" in areas where it has an important role to play.

Cadastral support systems as well as satellite mapping being prerequisites for various needs in a modern economy - from land reform and tax collection to collateral for loans and natural resource planning - would seem to be areas where the government needs to be active also in a more market oriented economy.

Finding: Both of the projects evaluated can also be said to belong to the category "cathalytic" or strategic in the sence that they represent areas where the donor can, in the present stage of Philippine economic development, "make a difference" with its aid program.

4. Coordination, replication and compatibiity of systems

If it is decided to give continued suport to the cadastral support services project and/or the Satellite mapping project, the question of replication - coordination and compatibility must be emphasized.

While we do not find that these aspects (given the objectives of the projects) have been neglected so far, it is clear that, with the rapidly increasing number of systems existing in an increasing number of agencies, the issue of compatibility will become much more challenging in the future. This issue was discussed at length in chapter V above. One of the conclusions from that discussion is that the projects would need to cooperate more closely with the coordinating mechanisms that exist, e.g. the *Inter Agency Task Force on Geographical Information.*. Another is that the question of coordination probably should be lifted up to a higher political level, namely ministerial, to become effective.

For Sida, lacking a central development cooperation agreement with the Philippines, it might seem difficult to achieve inter-ministerial coordination in

methodology etc. But the issue stands out as so important that a solution must be sought. The long-run sustainability of both the projects to a not negligable extent depend on ensuring national compatibility of the systems.

In my opinion Sida could also consider giving direct or indirect technical assistance support to the Inter-Agency Task Force on Geographical Information.

Conclusion: While we do not find that these aspects (given the objectives of the projects) have been neglected so far, it is clear that, with the rapidly increasing number of systems existing in an increasing number of agencies, the issue of compatibility will become much more challenging in the future

Recommendation: In the future the projects would need to cooperate more closely with the coordinating mechanisms that exist, e.g. the *Inter Agency Task Force on Geographical Information.*. The question of coordination should probably be lifted up to a higher political level, namely ministerial, to become effective.

5. Other donors

Rural development. While there are today many donors - a dozen or more - in rural develoment or programs directly or indirectly associated with the CARP, there is only one other donor, apart from Sweden, that is involved in computerized geograpic systems, namely Japan.

Management of natural resources and environmental protection. During 1980-88 The West German Government financed a forestry inventory project based on aerial photo interpretation and ground truthing. This project did however not cover the entire country, and the photos were from many different years.

Since 1990 the Australian Government has assisted NAMRIA in building up a complete remote sensing laboratory, and to train the staff in image processing and geographical information systems.

Since the late 1980s the Japanese Government has assisted the Bureau of Soils and Water management of the Department of Agriculture in remote sensing and geographical information systems. They produce topographical maps from aerial photography on a scale of 1:5,000 and 1:10,000, as compared to the Satellite photos of SSC Satellitbild of scales 1:50,000 and 1:250,000.

VII SUMMARY OF FINDINGS AND CONCLUSIONS

Land reform

Land reform is today, and has been for many decades, perhaps the country's most burning *political* issue, and the implementation of an effective land reform is by many believed to be a necessary condition for avoiding social and political unrest in the country.

Following very slow progress during the initial years, implementation of land redistribution has picked up dramatically since 1994. Most available public lands have now been redistributed, as well as most private lands above 25 ha. All big land owners in the Philippines have today already lost their lands, except for the lands that were exempted from CARP because they were deemed to be successful commercial operations like e.g sugar plantanations. Redistribution of privately owned lands lags behing that of Government owned lands.

In spite of important achievements during the last few years the land reform program is still well behind schedule. Many of the the bottlenecks to implementation seem to persist, among them: loopholes in the law, institutional bottlenecks, absence of accurate data on landownership and tenurial relations, limitations of financial resources, lack of surveying capacity.

Most of the many different activities involved in the land redistribution work of CARP stand to benefit directly or indirectly by the cadastral support services project.

Land reform by itself is not a panacea for poverty alleviation. It can be seen as a necessary condition, but not a sufficient. Experience from many other countries shows that it must be accompanied by programs of infrastructure and agricultural services to the new farmers-owners

Most of the funds allocated for CARP today are used up to pay the land-owners for the nationalized lands, leaving little for needed infrastructure

According the the World Bank, a number of changes need to be made in the current program to reflect the fact that land reform is largely a question of alleviating poverty

If the objective is set at *achieving maximum poverty alleviation among the rural poor*, CARP should be modified by (1) limiting land redistribution to

areas where need for it is perceived to be the greatest, thereby (2) freeing more funds for infrastructure and agricultural services, (3) making the land reform program more market oriented, and thereby more decentralized, (4) introduce a land tax as this would encourage many land-owners to sell voluntarily or use their land more efficiently.

If, on the other hand, one believes that the *political* dimension of land reform is all important, namely that the redistribution of land in itself is a necessary condition to preserve social and political peace in the country, then the Government is obviously limited in its options to cut down on the scope of the present universal land reform program

More than a third of Philippine households still have incomes below the official poverty line. There are very sharp geographical differences. In rural areas the poverty incidence is reported to be between one half and two thirds of the households.

Environment

Philippine environment today suffers from over-exploitation of natural resources, deforestation, severe soil erosion, and pollution, and the problems are likely to become more severe because of a rapidly growing population and increasing industrialization and urbanization. *Deforestation* continues at an estimated annual rate of 100,000 ha. Coastal resources are threatened by over-exploitation and the widespread use of destructive fishing methods. An estimated 30 % of the total *coral reef* area in the country has already been destroyed and another 30 % is in poor condition. One third of the country´s 400 major rivers are heavily polluted.

Public expenditures on natural resource management and environmental protection have grown by almost 20 per annum over the last five years. Despite significant progress achieved, several institutional and resource allocation issues remain to be addressed. Enforcement of existing environmental regulations remain difficult, primaily reflecting inadequate institutional and financial capacity.

Cadastral support systems to CARP

The project documentation only states equality as an overall objective, but other objectives, are also relevant and should be added as the successful implementation of a land reform program can be expected to have an impact also on *economic growth* , *management of natural resources and environment* as, as well as *enhancment of democracy.*

All the inputs and activities as foreseen in the project documentation have been duly implemented. Only a few minor points need to be criticized or discussed. Documentation regarding the project seems to be complete, and is usually presented clearly and pedagogically

Today's situation is that the consultant can order purchases by his own decision, but the DAR project Director can not. We are here touching upon a difference in the mode of operation between BITS and old SIDA which needs to be discussed.

All the systems, as concerns both hardware and software, installed by Swedesurvey in the DAR central office, are working smoothly, and the staff running them are proficient enough to be able to train other staff of the provincial and municipal offices in running the same. DAR central office today posesses a functioning computerized cadastral support system - consisting of GPS, APC, LIS and GIS - which is able to capture, encode, elaborate, process, present and print out text and graphic information, as well as maps in different scales

Training has been quite effective, but the total number of staff trained to operate the various systems is relatively small making the system vulnerable to loss of manpower. Almost all the staff have a university level degree, and would therefore seem to be overqualified for their tasks. While this is obviously good for the project at present, it raises the question whether this staff will stay on their jobs.

Efforts of replicating the CSS system to the designated DAR regional, provincial and municipal offices, are under way, but there is still a way to go before a computerized system can be operational. They are yet to receive the necessary computers and printers.

The objective of *integrating the cadastral support system with existing systems at other CARP-implementing agencies* has been addressed, but it is not clear exactly what was intended by the donor. Depending on *how* the ambition is defined we find that the project has failed or succeeded in this task.

The time which can usefully be spent on coordination with other agencies is limited, but it is clear that the issues of coordination, compatability and integration must become much more important in subsequent stages of this project.

Only limited efforts have been made by the project to demonstrate and spread, or ensure compatibility with other non-CARP agencies. This is not required by the project's plan of operation, but the contention of this evaluation is that it *should* also be an objective, because many other agencies are - or want to be - involved in similar GIS systems.

There seems to be no question that the outputs produced by the CSS project noticably affect CARP implementation. There are a number of CARP components which directly rely on the computerized information being supplied by the CSS. The project's objective of facilitating the implementation

of CARP is thus achieved.

A direct bottleneck for the speedy execution of the targeted land redistributions are the insufficient resources and capacity of DAR and of DENR to carry out surveying and cadastral mapping work, without which no land aquisition nor land distribution can legally take place.

Given the trend towards standardization of terms, character, as well as costs in the increasingly active international market for consultancy services in cadastral mapping techniques, procurement has grown more business-like in recent years. This seems to be true even for tied aid funds. In an efficiently run project like the present one, we are therefore inclined to assume that the results have been achieved in a cost effective way.

The land reform program is important for its potential to achieve *social and political peace* in the country. If this potential is realized we can also claim that it contributes to the country´s long run development

It is evident that a program which takes land from the rich in order to give to the poor will fulfill the objective of *enhancing equality.*

If managed properly it is also likely to contribute to *poverty alleviation.*. This holds even though the rich are paid for the aquisitioned land, and even though the poor are paying (a subsidized price) for received land.

When it comes to promoting the objective of promoting *economic growth* there is a more mixed picture. It depends on the situation in each particular case, mainly on the type of land in question: How was the land used before and how is it used after the the nationalization and redistribution?

A relatively large share of the lands distributed so far have been Government owned lands, part of which were previously idle or used only little. In these cases we can expect agricultural output to be enhanced by the land reform. On the other hand, there are nationalized lands, which were previously used for commercially successful large scale plantation type production, and where this land after the redistribution will be tilled by many small independent farmers/ settlers, some of whom have little or no experience from agriculture, least of all from commercial type farming. In these cases we must assume that the country´s economic growth (at least in the short run) will be hampered by the land reform.

In very general terms it seems that most studies (around the world) on "the economics of land reform" come to the conclusion that a land reform based on more equal distribution of land can normally be expected to be economically advantageous for the country.

A recent survey of CARP beneficiaries revealed that about 75 % of them perceived that their lives had improved after becoming CARP beneficiaries. 77 % of them attributed this to CARP. Of these 89 % said that the improvement had been primarily due to the abolition of share tenancy, while the rest thought it was due mainly to the provision of support services under CARP.

Income data showed that households derive more income from non-farm sources (55%) than from farm work (38%). The incomes of the ARB households were found to be significantly lower than the national average. While the 1, 4 million ARB households constitute about 11 % of the the country´s total households, their income was only 5 % of the nation´s total income. The same proportions were found for household expenditures.

The objective *enhancing democratic development,* we can normally expect to be served when masses of former landless people become self-employed farmers, and thereby presumably get a bigger stake, as well as a bigger say in local government

Satellite mapping of natural resources

Phase II of the *Satellite mapping of natural resources project* has not been evaluated. Nor is apparently any other documentation available from the donor assessing the outcome of this part of the project, financed by BITS, originally amounting to 5,3 MSEK, but revised down to 2,9 MSEK.

The project activities were implemented efficiently and according to plan, and the characterization of NAMRIA as "a competent, modern and fully eqipped work place for remote sensing", which was made by an evaluation mission in 1992, would seem to be applicable also today. According to NAMRIA´s officers interviewed the foundation was laid during the first phase of the project, and since then a partial and balanced up-grading of needed soft-wares and some hardware has been undertaken.

All the output targets, given the agreed down-sizing of the project scope, were achieved with out any problems.A problem remaining from the earlier phases of the project is that NAMRIA is not allowed to charge its clients the full actual cost of the maps that it supplies. This means not only that its clients enjoy a substantial hidden state subsidy, but also that NAMRIA is deprived of an incentive to spread its maps and services, thus preventing a sound market situation to develop

The international price of satellite data is very standardized, so in the competition between suppliers it is the quality and price of the surrounding services offered which are decisive. DENR sees itself as a cost conscious procurer of services. Even if the aid funds in question had been untied they would for this procurement still have chosen Satellitbild

Regarding the *effects* of the project, all the targets listed in the projects goal hierarchy have been attained. The project has facilitated *the construction of realistic plans for the country's natural resources management and exploitation;* and for *"legislation and other measures to protect and enhance the environment."* It has also facilitated the *"planning of evacuation routes for the local population"*

Given the many applications of the project results in legislation and other initiatives aiming at improving both natural resources mangement in general and environmental protection and enhancement in particular, we can assume that the project has in deed had a beneficial impact in **protecting and enhancing the environment**. The clearest example of this is perhaps the legislation banning certain types of logging in order to protect the country's virgin forests, which is reported to have come about as a direct result of the satellite imagery supplied by the project.

By virtue of the many uses that have been made of the satellite imagery we can likewise assume that there has been a beneficial impact on the country's ability to derive higher **long run economic benefts** from its exploitation of the nation's natural resources.

NAMRIA having built its own in-house capacity to interpret and process received satellite imagery, the project can be expected to have a good chance of becoming *self-sustainable.*

Coordination

GIS has been used in the Philippines from 1970, and since then perhaps as many as 40 different agencies have introduced its own GIS data base. But there still does not exist a national system that interlinks geo-information available in different government departments and private offices. There are plenty of GIS to choose from, but a standard data set from which all these systems can relate, interlink and share data is still unavailable

Many agencies today produce maps for their different individual needs choosing different scales and projections. Little or no coordination has taken place and there is today a proliferation of different systems and coverages of similar data. This seems to be true not least in the area of land data.

Some initiatives have been taken to address the problem of coordination, the most tangible being the creation of the *Inter agency Task Force on Geographical Information,* so far however without any forceful implementation.

The donors seem to have mainly given lip service to the problem of coordination. One of the reasons why the Task force has not had more

penetraing power up to now may well be the fact that no donor seems to have chosen to give support to or cooperate with this Task Force. Such support does not necessarily, nor primarily, have to be by financing its operations. Perhaps more effective would be for the donors to demand implementation of and compliance with some of the group´s recommendations as a pre-condition for giving financial support to other "regular" activities of the agencies involved

Sweden´s future aid

The two projects evaluated here - cadastral support services and satellite mapping - both seem to fulfill most of the criteria posed by the Swedish aid strategy. They are aimed at benefitting environmental protection and poverty alleviation respectively. They are both very much geared towards the transfer of particular Swedish experience and knowledge, which can be put to good use in the Philippines, and they are implemented by way of contract financed technical assistance.

Given that these projects have been evaluated and found to have performed well so far, they would both seem to be obvious candidates for continued Swedish financing.

The proposals submitted to Sida for additional phases of these two projects both seem to emphasize the transfer of knowledge aspect, rather than the transfer of resources.

Both of these projects can also be said to belong to the category "cathalytic" or strategic in the sense that they represent areas where the donor can, in the present stage of Philippine economic development, "make a difference" with its aid program.

While this evaluation does not find that the aspects of coordination (given the objectives of the projects) have been neglected so far, it is clear that, with the rapidly increasing number of systems existing in an increasing number of agencies, the issue of compatibility will become much more challenging in the future

One of the conclusions from the discussion on coordination is that future projects should cooperate with the coordinating mechanisms that exist, e.g. the *Inter Agency Task Force on Geographical Information.*. Another is that the question of coordination probably should be lifted up to a higher political level, namely ministerial, to become effective.

VIII RECOMMENDATIONS

The question of ensuring coordination and avoiding future incompatibilities between different geographic systems, installed and developed in various agencies, should be made a much more central issue in future projects, or new phases of existing projects. If the donor Sida has any intention of raising its profile in the development dialogue with the Philippine Government this issue would seem to be a very suitable one on which to engage in a dialogue.

Future projects, or new phases of existing projects, in the area of computerized geographical systems should cooperate with, or possibly give direct or indirect suport to, the coordinating mechanisms that exist, e.g. the *Inter Agency Task Force on Geographical Information..*

Also, the question of coordination in the field of geographical information systems should be lifted up to a higher political level, perhaps ministerial, to become effective.

Given that the two projects evaluated here are aimed at benefitting environmental protection and poverty alleviation respectively, and that they are both geared towards the transfer of particular Swedish experience and knowledge, which can be put to good use in the Philippines, and given that they have been evaluated and found to have performed well so far, they can both be recommended for continued Swedish financing, provided that such a priority is expressed by the recipient country.

Sida should strive to arrive at a solution regarding the cases of incompatibilities, that were noted by the evaluation, between BITS´ versus "old" SIDA´s development cooperation cultures.

IX LESSONS LEARNED

Land reform a necessary but not sufficient condition
For land reform programs to be successful (in the sense that they will benefit the landless poor) the redistribution of lands must be accompanied by large investments in infrastructure and agricultural extension services for the new land-owners. This is the conclusion that can be made on the basis not only of the many years of land reform efforts in the Philippines, but also based on the experience from many other countries in similar situations. In the effort to improve the living conditions of the rural poor, land reform can be seen as a necessary, but not a sufficient condition.

Functioning of advanced computerized information systems
In a country like the Philippines it is possible to successfully implement an advanced computerized information system, which for its functioning depends on the availability of many skilled local personnel, *but* one must allow ample time for the new computerized systems and routines to "sink in", before the functions can become operational on a national level.

Impact of high-technology projects
The revelation of the satellite imagery that the country´s virgin forests were threatened goes to show that also a relatively small high technology project can have a major environmental impact when applied judiciously and implemented successfully.

Importance of coordination
Even though no actual case of incompatibility of systems occurs in the short run, the evaluation of the two projects shows the great importance of coordination even in the early stages of a project. Often incompatibilities of different systems will manifest themselves only after several years have passed, when information systems have grown too big to be easily changed.

ANNEX 1: Acknowledgements

I am grateful to all the persons listed in Annex 2 for making themselves available for interviews and meetings; in particular to the many DAR and other staff who sacrificed their weekend holidays because of my visit to the settlement areas in Mindanao.

A special thanks is due Ms*Tess Landicho,* who organized the field trip to Mindanao, and to *Mike Pangillinan* who accompanied me in the field visit. All the staff of the DAR office, with its *Director Pelayo,* were friendly and forthcoming in demonstrating the information systems. The evaluation was also facilitated by the existence of complete and to-the-point information materials supplied by the staff and by the consultant.

Ola Wennerby of Swedesurvey, and *Björn Ohlson* and *Hans Rasch* of SSC Satellitbild were helpful in supplying information as well as advising on logistics, as was also Sida´s project manager *John-Olof Johansson.*

ANNEX 2: Persons Met

DAR	
Alfiln, Emmanuel	SUARPO
Alip, Asec	
Carlos, Ema C.	CARPO
Falcon, Billet	Program Officer
Garilao, Ernesto D.	Minister for Agrarian Reform
Landicho, Tess	DAR-Swedesurvey office
Madrono, Asec	
Pangillinan, Mike	Geodetic Engineer
Pelayo, Renato G.	Director
Ponce, Jose Mari B.	Director PDMS
Oriente, Rolando M.	SUARPO
Ramos, Jose A.	SUARPO
Samiano, Ranelisa	PDO II
DENR	
Ganuelas, Erlinda	Project Officer, PPD-FASPO
Jara, Robert	Chief Project preparation Division
Lachica, Mitchelle	Forestry Management Bureau
Limsuan, Medel	SSRS
Salvador, Jerry	Geologist
NAMRIA	
Bina, Ricardo T.	Deputy Administrator
Capistrano, Wilhelmina P.	Asst. Director, Informations Dept.
Isada, Jose Galo P. Jr.	Director Mapping and Reprography Department
Papa, Linda SD.	Deputy Administrator for Information Management
Parayno, Nicandro P.	Sr.Engineer, Mapping Dept.
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ANNEX 4: Terms of Reference

Evaluation of two Swedish technical assistance projects in the Philippines: Cadastral Support Services to Land Reform, and Satellite Mapping of Natural Resources

1. Background

After a long term of struggling with economic and political crises, the Philippines is now moving towards a more stable situation. Political democracy has been introduced but the impact from the political crisis of the 1980s is still substantial on the economic performance.

The Swedish involvement in the Philippines, with technical assistance through BITS, was initiated in 1986. At first the emphasis was put in the industrial sector and channeled through BITS. Swedish technical assistance has been given to 60 different projects in a wide range of sectors at a total cost of 200 MSEK. Focus has been set on the environmental and the energy sectors.

2. Objectives of the evaluation

To be able to plan future actions in the area, there is a need to analyze the effectiveness of the on-going and completed projects. This should be done in a micro perspective, regarding the fulfilment of respective project, and in a macro perspective where the consultant shall report if the efforts fulfill the ambition to spread the knowledge within the country.

The evaluation shall:

- assess the government´s policy and plans in respective sector in relation to the overall national development plan,
- assess eah project´s relevance and efficiency in relation to the overall sector policy,
- assess each project´s relevance and efficiency from the Swedish and Philippine partners´ persepective.

3. Scope and focus of evaluation

The evaluation shall focus on two selected projects, of which Sida has chosen both:

Cadastral support to CARP, Phase III

- The consultant shall within the project called Cadastral support to CARP evaluate the impact and effectiveness of the project. The aim is to see whether efforts like these contribute to the Government´s land reform.

- The consultant shall evaluate if the Swedish partner *Swedesurvey* offers the needed support for this process, including an assessment of the cost effectiveness of the project.

Satellite mapping of natural resources
- The consultant shall within the project called Satellite mapping of natural resources evaluate the impact and effectiveness of the project. The aim is to see whether efforts like these contribute to the government's management of natural resources and environmental protection.

- The consultant shall evaluate if the Swedish partner *SSC Satellitbild AB* offers the needed support for this process, including an assessment of the cost effectiveness of the project.

4. Method

The study shall be carried out by an economist.
The consultant shall use existing documents as basis for the study, complemented with interviews and one field visit to the Philippines. The study will focus on assembling and analyzing secondary data supplemented by information gathered through interviews with knowledgeable people (Sida presonnel, consultants in Sweden, public authorities and departments, recipients and other relevant persons) active in respective field, in the Philippines as well as Sweden.

The entire study shall not use more than five (5) weeks for the consultant, including one (1) week of preparation in Sweden, 12 days of field work in the Philippines, and 8 days of report writing in Sweden.

5. Reporting

The consultant shall present findings of the evaluation at a meeting on the 5th of December, both written and orally.

A draft report shall be submitted to Sida in five hard copies by the 19th of December 1996.

The final report shall be submitted by the 3rd of Februatry 1997. It must be concise and written in English. The report shall be submitted in five hard copies and two IBM compatible diskettes.

The final report shall start with an executive summary including recommendations. A list of sources of documentations and people met shall also be included.

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