

Philippines-Australia Land Administration and Management Project

CADASTRAL SURVEY AND MAPPING REPORT FOR OUTPUT 2.1, ACTIVITY 11

Prototype 1, Leyte

June 2002

REPORT C15



PA-LAMP

CADASTRAL SURVEY & MAPPING REPORT

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A. INTRODUCTION

1. The project is multi funded with inputs from the World Bank under a Learning and Innovation loan, the Australian Government through an AusAID grant and the Government of the Philippines (PA-LAMP). The loan was executed in October 2000 and became effective in January 2001. The grant funding for technical assistance was contracted to the AMC (Land Equity International) on 5 October 2001. The WB –GRP loan agreement plans that the project should attain its objectives by late in year 2003.

Objectives of Land Administration and Management Project

2. The objectives of the Project are to test alternative approaches to accelerate programs designed to improve the protection of rights to land, eliminate fake titles, introduce an equitable system of land valuation, formulate and approve policy and regulatory changes, and formulate the institutional arrangements needed to support implementation of the subsequent phase of the Program.

Objective and Scope of Prototype 1

3. The objective of this prototype is to assist in the development, training, testing and documenting of procedures and methods for mapping land parcels prior to land titling, during systematic land titling and at the time of land registration in order to support the overall first time issuing of land titles.

These are main types of production activities:

- Cadastral surveys of untitled lands and the production of cadastral maps;
- CIM¹ and making of cross indexes (XINDEX) to control duplicate land titles and for other administrative purposes;
- Testing of systematic titling processes;
- Issuance of titles;
- Integration of the new records into the ROD², streamlining of land registry operations to maintain quality of land register documents and better exchange of land information between related agencies of government.

4. In addition, there is a strategic process of developing a national plan for improved management of land ownership related records. This will be based on the lessons learnt from this Prototype, and also from the urban activities in Quezon City in the Prototype 2, and will also link with the implementation of the BOO³ Project.

5. The project followed a Bridging Project that instigated the procedures that are in place, but these would be modified and tested to obtain standard tested procedures that would be suitable to

¹ Cadastral Index Map

² Registry of Deeds

³ Build-Own-Operate

implement throughout the Philippines in Rural and Urban situations.

6. The policy making body for the LAMP is a Taskforce created by virtue of Executive Order No. 82 on 13th March 2002. The Taskforce is under the Executive Secretary and consists of seven members, being:

- Senior Consultant on Poverty Alleviation and Good Governance;
- Secretary DENR¹;
- Secretary of Justice;
- Director General of NEDA²;
- Presidential Adviser on Official Development Assistance Absorption;
- Two representatives from private sector, preferably from real estate development and/or banking industry, designated by the Executive Secretary

7. There is also a Technical Working Group to support the Taskforce. Members are: from the DENR – LMB³, FMB⁴, MGB⁵, PAWB⁶, EMB⁷, ERDB⁸ and NAMRIA⁹; from the DOJ¹⁰ – LRA, COSLAP¹¹; from the DOF¹² – BLGF¹³, BIR¹⁴; from the DA¹⁵ – BSWM¹⁶; from the HUDCC¹⁷ – HLURB¹⁸, NHA¹⁹.

8. PIO²⁰ is a pilot project for learning and innovation. It seeks to develop a unified and systematic land administration and management system with a survey and mapping component and the systematic land adjudication and titling component. For surveys, it aims to come up with systematized and efficient procedures in surveying and mapping to support land titling. In PIO 1, the proposed methodologies in surveys and mapping have to be tested, evaluated and improved upon to obtain the most appropriate method which is sustainable, efficient, technically accurate and acceptable to the community.

9. The lead agency managing the prototype is the DENR, DAR²¹ and the ROD also are stakeholders who will be sharing the facilities of the OSS²². The composition of prototype personnel are from DENR, DAR, and CENRO²³, the remaining staff are employed on a contractual basis by the prototype. Organisation and Management of Prototype 1

¹ Department of Environment and Natural Resources
² National Economic Development Agency
³ Land Management Bureau
⁴ Forest Management Bureau (DENR)
⁵ Mines and Geoscience Bureau (DENR)
⁶ Protected Areas and Wildlife Bureau (DENR)
⁷ Environment Management Bureau (DENR)
⁸ Ecosystem and Research Development Bureau (DENR)
⁹ National Mapping Resource Information Authority
¹⁰ Department of Justice
¹¹ Commission on the Settlement of Land Disputes (DOJ)
¹² Department of Finance
¹³ Bureau of Local Government Finance (DOF)
¹⁴ Bureau of Internal Revenue (DOF)
¹⁵ Department of Agriculture
¹⁶ Bureau of Soils and Water Management (DA)
¹⁷ Housing and Urban Development Coordinating Council
¹⁸ Housing and Land Use Regulatory Board (HUDCC)
¹⁹ National Housing Authority (HUDCC)
²⁰ Project Implementation Office
²¹ Department of Agrarian Reform
²² One Stop Shop
²³ Community Environment and Natural Resources Office

10. Prior to PA-LAMP starting there was a Bridging Loan that implemented the first phase of the prototype. Certain systems were introduced and these have been refined where possible during the first six months of the present project.

11. The structure of this report is;
- (a) Introduction
 - (b) Pilot Study Location
 - (c) Purpose of Land Surveys and Parcel Mapping
 - (d) Cadastral Surveying
 - (e) Cadastral Index Maps
 - (f) Records Management
 - (g) Conclusions
 - (h) Recommendations

Attachments:

- 1 Procedures Manual for CIM Production

Annexes:

1. TOR International - Land Parcel and Mapping Adviser
2. TOR National - Land Survey and Mapping Adviser
3. CIM Production Flow Chart

B. PILOT STUDY LOCATION

12. The pilot study location is in the Province of Leyte, Island of Leyte and is contiguous in areas covering the municipalities of:

Municipality	No. of Barangays	No of Lots	Area ha
Alang-alang	54	7859	14308
Dagami	65	10644	12478
Palo	35	14727	7034
Pastrana	29	3951	4741
San Miguel	21	3747	8389
Santa Fe	20	8756	8327
Total	224	49684	55277

C. PURPOSE OF LAND SURVEYS AND PARCEL MAPPING

13. The *purpose* of the Land Parcel Survey and Mapping component is to assist the judicial adjudication process by testing existing cadastral surveys procedures, implement new surveying techniques and a mapping system ie CIM, records management in the form of an integrated database and the proposed procedures, also:

- Assist in the process of land titling;
- procedures and regulations;
- technology;
- staffing and training;
- resource sustainability;
- quality assurance;
- management.

14. Surveying and mapping is the basic technical support requirement prior to the titling of land parcels. The activity produces plans of survey, CIM and textual information required by the courts of law as basis for adjudicating and decreeing ownership to a piece of land. Essentially, the following basic documents are prepared, validated and submitted to the cadastral courts:

- Upon filing of Petition

- Transcribed technical description of land (3 copies);
- Geodetic Engineers certificate duly notarised (3 copies);
- Barangay Boundary and Index Map (BBIM) with sepia (3 copies);
- Survey/cadastral map duly approved:
- During Publication:
 - List of Claimants in barangay;
 - List of adjoining owners:
- Filing Answers:
 - Documents supporting claims of ownership:
 - Deed of sale or donation
 - Deed of extra Judicial partition
 - Waiver or quitclaims
 - Title (OCT/TCT) if any:

15. The introduction and testing of survey processes and methodologies are to be applied in selected barangays in all the pilot municipalities.

D CADASTRAL SURVEYING

Study Focus

16. The survey and mapping component focuses on the applicability of ground survey methods. It applies attainable and acceptable new technologies of ground surveys using the accurate GPS¹ for the densification of the survey control and the use of total station equipment for lot parcel surveying.

17. Eventually, the ground surveying method will be complemented by the mapping techniques utilizing orthophoto maps and satellite imagery. These three methodologies are to be studied to determine process efficiency and effectiveness, as well as their sustainability and acceptability for expanded operations.

18. This first survey implementation had ground surveys executed in the municipality of Pastrana in the barangay of Macalpiay by contract with SOLAR Surveying Corporation. Barangay Libertad of Palo was surveyed by administration using a PIO 1 organized survey team using DENR staff. The project of Macalpiay is completed and approved but the administration project of Libertad is still ongoing due to errors in field survey.

1 SURVEY PROJECT EXECUTION AND LESSONS LEARNT

Macalpiay Survey

19. The survey of barangay Macalpiay in Pastrana Municipality was executed by contract. It covered the entire barangay of 143 hectares with 172 lots surveyed, plus a political boundary survey was previously made, ie the barangay boundries. Essentially, this was a correction survey being part of the Pastrana cadastre that had erroneous survey control. The pilot barangay would have been a test case for the adjustment of surveys to the PRS92² datum.

20. All surveys were connected to PRS92, but the coordinates were not available till May

¹ Global Positioning System

² Philippines Reference System 1992

2002. To enable the documentation to proceed, the survey returns were calculated in the old system. Once the PRS92 coordinates were made available, recomputations were required, so that the Survey Division of the DENR could process and approve the survey.

Procurement of Survey for Macalpiay

21. The survey contract required to go through the old bidding process of DENR. Essentially the government estimated the cost of the survey and tenders were submitted by private consultants. The method of selection is by the tendered rate being no more than 10% above the government estimate and no lower than 10% below the estimate and the contract requirements of DENR. The bidding was prepared and conducted by PIO 1. This approach discourages very low bids that may result in abandonment of the project because of losses and very high bids that make the project very expensive.

22. The technical requirement for a potential bidder in barangay Macalpiay required the use of a total station, and proven experience in cadastral surveys. This eliminated any small practitioner from purchasing a costly total station, due to the low return in the project. This also discouraged larger practitioners who were not based in Tacloban due to high mobilisation and demobilisation costs. Consequently there were only a few bidders, by this approach the cross section of contractors attracted was not good. For future procurement of survey contractors a selection of both small practitioners and major contractors with good track records and expertise in cadastral surveys should be encouraged, ie joint ventures.

Innovations in Cadastral Survey of Macalpiay

23. An innovative feature in the cadastral survey process at barangay Macalpiay was the utilization of SNS¹, which replaces the old notification and sketching cards. This is complimented by the introduction of a team of field adjudicators and survey verifiers for the duration of the lot surveys made the field work easier by locating the owners and solving boundary disputes in the field. The verifier's task is that of quality assurance to assure that all documentation of the SNS is completed correctly in the field. Another task of the verifiers is to ensure that the survey is carried out correctly.

CRS²

24. CRS activities precede any survey tasks. Landowners are:
- Identified;
 - Validated;
 - reasons why the survey is being conducted are explained, including:
 - its use in issuance of titles;
 - benefits of having a land title are impressed upon the landowners.

Survey Notification Sheet

25. In the old system of cadastral surveying, land claimants/owners were initially issued notices of survey through the Sketch and Notification Cards. The Notification Card is completed at the stage of monumentation of the boundary corners. The corresponding notice with the signature of land claimant was issued upon completion of the lot sketch. Generally, these sketches were free-hand drawings and the distances and internal angles were measured by

¹ Survey Notification Sheet

² Community Relations Services

guesstimating. Frequently, the free-hand drawings did not reflect what was on the ground, resulting in improper corner identification, misconnections of lot corners thus resulting in large errors.

26. The use of SNS provides an effective check so that the errors of the previous method are avoided. The SNS also reflects the acceptance of all the adjoining lot claimants in the aspect of the location of the placed monuments by signing the SNS sheets. The SNS when completed becomes a valid document in the titling process.

Field Verifiers (Field Quality Assurance)

27. Survey verification, as traditionally practiced is basically an office verification on field data submitted with the completed survey returns. Errors in the field cannot be checked if the data has been manipulated prior to the presentation of the survey returns.

28. By the use of verifiers, the data when collected in the field and the method of data collection is more likely to be of a higher standard and free of fraudulent observations. Field verifiers audit the process of survey and mapping, and check the competence of the people performing the survey. The verifiers' role is to assure that the instruments are used correctly and that the survey is carried out to the standard required by the project.

29. Field verification is sustainable and is planned to be used in future surveys. The other benefit is not returning to resurvey for the errors will be found in the field and not after the survey is completed.

Field Adjudicators - The Field Negotiator and Adviser

30. Conflict of claims among land owners as well as lot boundary disputes is common during cadastral surveys; many are minor misunderstandings, suspicions, and misapprehensions. The task of the field adjudicator is a delicate one for they are referee, judge and adviser. The adjudicator, requires a knowledge of survey regulations, applicable land laws, as well as being a calm negotiator.

31. The adjudicator explains the advantages of settling boundary disputes and claims or ownership. They present the comparative benefits as well as personal losses and risks for landowners who agree to participate in the survey versus those who prefer to resist. The adjudicator operates alongside both the survey team and the SNS team, acts as peacemaker and adviser, and confronts the issues for speedy settlement for all conflicting parties.

Libertad Survey

32. The execution of a cadastral survey for barangay Libertad by administration was an attempt to prove that a survey project can be as effectively run by a government survey party compared to a private surveying firm. The Libertad project proved otherwise, but this should not be taken as true representation of a government surveys. The surveys in Tanuan and Tabontabon which both adjoin Palo and Dagami are instances of recent surveys undertaken by the government and have been successful.

33. There were a lot of factors that worked against the project in Libertad, these being:

- The choice of the project itself was not good. Libertad is in the municipality of Palo and the cadastral survey was abandoned by a previous contractor. The survey contract

between the Bureau of Land Management of the DENR has not yet been rescinded so that an issue arises as to whether PA-LAMP can just take over the completion of Palo without the formal severing of the old Cadastral Survey Contract and the necessary final evaluation of the project and its accomplishments.

- A hastily organised survey team composed of a Geodetic Engineer/Surveyor, Technicians with diverse backgrounds not necessarily experienced in survey and some utility personnel were seconded from CENRO who don't necessarily have survey experience, and a hodgepodge of other utility personnel. The team leader and some supervisors were not sufficiently oriented in cadastral survey project planning, supervision and the basic functions of management. None could be considered sufficiently trained in the handling and operation of a total station. The core elements of the survey team were not trained correctly to handle the target prisms. Such a team cannot be expected to succeed. Added to this was a defective instrument, notwithstanding that the instrument was not checked prior to the project's commencement. All these factors contributed to defective survey traverses, which eventually had to be resurveyed.
- Equipment was purchased and the key survey personnel were trained in the proper use of the total station.

34. Libertad survey will be adjusted to the PRS92, DAR/Swedesurvey conducted the GPS control, but NAMRIA was requested to do some reobservations, but it was never part of their TOR.

35. The support activities in systematic cadastral surveying were also applied in Libertad as in Macalpiay. SNS and field adjudication were conducted. The survey verifiers were not as effective as in Macalpiay. This was due to the verifier having more than one task, ie computations. Some field supervisors who were responsible for the survey verification managed to check some of the surveys but this was not an intensified field activity.

36. It may be safe to say, that Libertad is a case of how not to start a survey project, but the case should be viewed and understood in the light of perceived pressure to quickly commence the survey project without proper investigation of the surveys needs. Personnel were being moved out to special assignments, but that does not mean the best personnel will be assigned. The competent few who are recruited could be easily overwhelmed by the enormity of the task assigned to them. The survey project in Libertad has shown that Human Resource Development (HRD) is a major issue for addressing, alongside new technology applications and training of the key personnel.

37. It was noted after consultation with members of a survey party that about 5% of boundary monuments were not placed.

New Survey Projects and the Failed Bidding Process

38. Nine barangays of the municipality of Pastrana were tendered for bidding in April, 2002. The intention was that each company who tendered would be awarded a contract for one barangay only. The volume of survey work for each barangay can be considered small. There were only nine bidders who participated and apparently qualified. Prequalification evaluation was not carried out with the bidders submitting the required documentation as stated in the approved World Bank documentaion.

39. The other bidders were perceived to belong to one group and submitted bid prices way

beyond the government estimate.

40. Upon post bidding evaluation certain factors were discovered, these were not acceptable and were:

- Instruments to be used were not of the type stated in the bidding documents and in some cases were being used on other projects;
- Some equipment to be used had expired certificate of registration, ie no calibration certificates;
- Some of the Geodetic Engineers did not have the required experience in cadastral surveys;
- One Geodetic Engineer has an abandoned previous project which is an automatic disqualification;
- Two were later disqualified for submitting a manager's check instead of the required bank certification of bid security;
- Consultants could not supply the required two survey parties per barangay.

41. No final decision has been made, yet the feeling is that the tender will be readvertised after discussions with the World Bank.

42. The tendering process is a long and drawn-out affair taking about 4 months, this needs to be addressed because a small setback like this will affect the overall systematic titling process and objectives of the project.

2 OBSERVATIONS

43. The tendering process as approved by the World Bank is not familiar to the Consultants who tendered for the Cadastral Surveys, even though a workshop was held on these procedures.

44. In the past there have been cases when a consultant was not awarded a contract and has then proceeded with court action to over rule the committee's decision. The tender documentation does not allow for a clause that nullifies these situations. If such a case was brought to court, the project would suffer greatly because the courts would place a restraining order on the survey contract until it has been through the court proceedings. There is a fear that such a situation could happen during the PA-LAMP and this would hinder the titling process.

45. Considering that the contracts are by barangay and thus small in area, the cost of procuring instruments suitable for the contract is prohibitive. In a lot of cases this precludes the small local practitioner for bidding, at the opposite side, the larger companies will not mobilise teams from the major cities because of the lack of profit in small surveys.

3 ORTHOPHOTO MAPS AND SATELLITE IMAGERY

46. The methodology of applied orthophoto maps and satellite imagery for mapping purposes in support of systematic land titling will have to be tested in the pilot area. The studies and learning will metamorphose into supplemental guidelines for survey mapping to support land title issuances. This complements the ground survey method for land titling.

47. The orthophoto maps will not be available until November- December at the earliest. The problem is the GPS surveys have not been completed by NAMRIA and this naturally holds up the photogrammetric work involved in producing the final product. There is a possibility that by the time the orthophoto maps are produced and delivered that both the International and National

TA's will be finalising their contract commitments with the project.

48. The satellite imagery was to be purchased this year. The best window for capturing the data is March – May, it is now expected that the imagery will be purchased next year. By the time that the imagery is procured, neither the National or International TA's are expected to be available due to their contracts with the project having expired, (there is a specialist in Satellite Imagery & Surveying planned to be mobilised).

4 LESSONS FROM THE PAST

49. From the National TA's past experience in the implementation of the cadastral surveys, paints a disturbing combination of technical and administrative deficiencies and neglect. The system and procedures were initially designed in the fifties to answer very limited demands in surveys and title issuance. The combined effect of rapid population, urbanization and economic development imposed strong pressures on the capacity of the service delivery system on surveys and mapping. Attempts to cope with these strong demands, decision makers attempted to concentrate on wholesale production targets, without respectively looking into improving the capability of the production process. Equipment used was obsolete, and organizational development did not keep pace with the workload demand.

50. Professional competency building in both government and private sectors was expected to catch up with the demand for surveys, but unfortunately it didn't. The ability of management to supervise cadastral project implementation was not significantly improved. The whole system of monitoring and evaluation was geared more on producing good reports than surveys, while qualitative management of outputs was neglected, and the entire process of producing results was never evaluated. It was assumed that the surveys were carried out as per the DENR Administrative Order of the time and that regulatory controls (ie QA¹) were adhered to, but in many cases this was not so which resulted in dubious surveys.

51. In PIO 1's pilot project, of the six municipalities, two are considered erroneous, two are in doubt and possibly erroneous, one expected to be correct but needs to be remapped, and the other is expected to have minor corrections and needs field validation. All need to be connected and adjusted to PRS92.

5 ISSUES IN LAND SURVEYING

52. In developing surveying procedures and methodologies for an integrated land mapping system, technical issues, as well as, social and political and legal concerns have to be addressed. A purely technical approach may spawn problems in the field operations and generate a significant amount of legal problems, due to:

- different problems developed over the years;
- unsystematic and deficient process of land surveying and mapping;
- diffused and weak administrative system overseeing land titling projects.

53. The following situations need to be noted and considered:

- Many old isolated and sporadic surveys are incorrectly positioned on the projection maps (an uncontrolled CIM) and sometimes on the ground due to the incorrect reference system used at the time of survey. Boundary bearings may be significantly different on the ground than what appears in the approved plan or land title.

¹ Quality Assurance

- The lot corner monuments have been disturbed by the farmer, land owner or the caretaker and no longer can be used as boundary definition.
- Land surveyed and titled appears to be within unclassified or classified timberlands due to inaccurate survey of the land classification boundaries by the previous Bureau of Forestry. There are known cases of these land classification boundaries being shifted by hundreds of meters.
- Titled properties are incorrectly marked or not marked on the ground making identification of boundaries difficult and making the adjustment of old surveys very complicated.
- Titled lots based on previously erroneous or spurious surveys are extremely difficult to evaluate technically for purposes of correct adjustment to the new cadastral system.
- Some political boundaries have changed over the years even though some are already surveyed, due to the absence of documentation of agreement between adjoining Municipal and Barangay councils. Agreements in the past have been verbal only;

54. The survey process and methodologies to be developed tested and adopted need to address the above situations, including other concerns of the community which surface during the survey. Essentially, the approach shall be grouped into:

- Technical procedures and requirements:
 - Appropriate instruments used;
 - Surveying competency requirement and team organization;
 - Technical process in the field operations and office processing;
 - Reference system used;
 - Data processing system for data computations and drafting of maps;
 - Accuracy requirements;
 - (SNS) Survey Notification Sheets;
 - Lot monumentation
 - QA
 - Records management
- Social process
 - Communication and public notices;
 - Dispute resolution process;
 - Community Relations Services (CRS);
 - Field adjudication process and documentation
- Legal considerations
 - Payment of taxes;
 - Payment of fees for services;
 - Claims of ownership;
 - Transfer of rights;
 - Inheritance and land donation.

6 TRAINING

55. The introduction of modern technology and the improvement of system and procedures in order to develop a new land administration system can only have impact if there are well trained personnel to implement and manage the surveys. It is good policy for programme managers to see that improvement in capacity, capability and organisational skills of the personnel go hand in hand with the improvements in systems, procedures and new technology.

56. For the surveying capability, PIO 1 needs both technical and managerial components. It is

stressed that what appears to be survey failures are the result of poor equipment and poor managerial and technical expertise within the organisation. In May 2002 two total stations and two GPS were made available, ie approximately one year after the request for procurement, and then training in the use of the equipment was conducted by the vendor.

57. When contracts are awarded, there must be intensive training for the contractors to ensure that the standard of work required is adhered to; this also applies to the field verifiers that are contracted to supervise the field and office activities, ie QA.

58. Project planning and management is lacking and there is a need to further develop the skills of project personnel in this area. This can be divided into two areas, being:

- Cadastral Project Planning stressing; target objectives, coordination of activities, resource procurement, planning and budgeting.
- Cadastral Project Administration with the focus on:
 - Pre project activities and requirements;
 - Community linkages, ie CRS dealings with local officials;
 - Project and individual performance monitoring and evaluation;
 - Quality Assurance assessment and supervision;
 - Personnel management.

Cadastral Survey Training Conducted

Workshop	Subject	Attendees
Conversion to PRS92	Understanding of the PRS92 system and the problems that would be encountered in converting the existing surveys.	Surveyor and cartographic staff
Lessons Learned 1 st quarter	Cadastral Surveys, lessons learned	Survey staff
Survey traversing and computations	Overview of the system for traversing and the newly developed survey computations software	Surveyors and Verifiers
Basic Computer Operation	Skills in computer operation, ie word, excel and windows	various
Total Station	Operation and maintenance of total station equipment	Surveyors and survey verifiers
Lessons Learned 2 nd quarter	Cadastral Surveys, lessons learned	Selected Survey staff



Survey Traverse and Computations Workshop

59. The training conducted is for the immediate needs of PIO1, these skills are now being applied in the survey operations. Evaluation will be made to determine the effectiveness and assess further needs. It is expected that reorientation among the trained personnel will be made at the field level.



Conversion to PRS92 Workshop

60. Additional training will be conducted in the near future. This shall not only be in the technical sphere but also in project administration and management.

Survey Software

61. Three software packages have been developed for the cadastral survey component of the prototype these are:

- PA-LAMP Traverse Calculator.exe which is a tailored program for the Philippines for traversing. The software will adjust the traverse which may be either on a known or unknown datum;
- PA-LAMP Side Shots & Lot Calcs.exe which calculates the radiations obtained from the traverse to the boundary monuments and then allows the operator to obtain areas and boundary azimuths and distances between monuments;
- PA-LAMP Intersections.exe is a small utility that is used in office calculations.

62. It is envisaged that the software will be made available gratis to all surveyors wishing a copy, and mandatory for all consultants contracted to carryout contracted work for PIO 1.

E CADASTRAL INDEX MAPS (CIM)

63. The CIM is an integral part of the project for it is the spatial component that ties all land records associate with any given parcel of land within the CIM by the means of a Unique CIM and UPI¹ ie the XINDEX key.

1 OBSERVATIONS

64. Prior to the Advisers being appointed to PIO 1, the cartographic section of the prototype had started producing CIM, but these were not to International Best Practice, and the section could not produce CIM for the projects activities within the required time frame for the other

¹ Unique Parcel Identifier

associated activities such as CRS and SAT¹.

65. On the first visit to the prototype and after discussions with the Quality Assessment Panel (QAP) the deficiencies in presentation and compilation of the CIM were noted. These deficiencies were related to the CIM manager who started to rectify them immediately.

66. The cartographic unit are now producing hand drawn CIM in advance of the needs of the project, and in a format that is in International Best Practice.

In the rural areas CIM are more readily compiled than urban areas due to the Cadastral Maps (Survey Plans) usually being of the same scale as that of the CIM, therefore it is just a matter of tracing in most circumstances.



CIM: International Best Practice in standardised format

2 ACHIEVEMENTS

67. It can be said that the CIM production has been a success in PIO 1, even though there have not been any final CIM produced, due to the late installation of the database (see Records Management Section of this report).

68. The CIM unit is capable of producing hand drawn CIM that is in International Best Practice, and now produce these in a timely manner to cater for all the needs of the project if given the correct response time.

69. A CIM numbering system that is unique which uses the base map geographical coordinates of the 1:4000 bottom left hand corner as the base reference coupled with the sheet reference down to the scale of 1:500. By using this system any CIM at any of the 4 standard scales used can be easily located geographically anywhere within the Philippines.

70. A standard CIM format that is acceptable to both prototypes.

71. Software was written to give both geographical and grid coordinates in PRS92 for the CIM extents, this also calculates the actual size of the sheet, and this depends on the location of the project area ie the width of the CIM changes as the Latitude changes.

72. The cartographic section not only produces CIM but consolidated maps of the barangays

¹ Systematic Adjudication Teams

for the use in the field by CRS, and all the textural data required by both CRS and SAT, see the Records Management section of this report.



Consolidated Cadastral Map of a barangay

73. Considering that the CIM unit is performing well, the International TA decide to halve the time spent in PIO 1 and devote more time to PIO 2 because the later required more input to succeed.

74. A Procedure Manual for CIM Production for “Hand Drawn” CIM has been produced; see Attachment 1 of this report.

CIM Produced

CIM Not International Best Practice	CIM in International Best Practice	CIM Format Preparation	Consolidated Barangay Maps
35	18	185	29

3 ORTHOPHOTO MAPS AND SATELLITE IMAGERY

75. The methodology of applied orthophoto maps and satellite imagery for mapping purposes in support of systematic land titling will have to be tested in the pilot area. The studies and learning will metamorphose into supplemental guidelines for survey mapping to support land title issuances. This complements the ground survey method for land titling.

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4 TRAINING

78. The main source of training has been “on the job” conducted by the CIM manager. It is futile to train the staff of the CIM unit in other techniques if the equipment and data are not available.

CIM Training Conducted

Workshop	Subject	Attendees
Conversion to PRS92	Understanding of the PRS92 system and the problems that would be encountered in converting the existing surveys.	Surveyor and cartographic staff
Cartographic skills	Ongoing OJT in CIM production (both quarters)	CIM staff
CIM format design held in PIO2	Standard CIM format was agreed upon by both prototypes	Selected CIM staff
CIM format	The design of a unified CIM between both prototypes	Selected CIM staff from both prototypes
Lessons Learned 1 st quarter	CIM lessons learned	CIM staff
Computer Systems Maintenance	Computer maintenance and basic trouble shooting	CIM computer operators
Basic Computer Operation	Skills in computer operation, ie word, excel and windows	CIM personnel that have no computer skills
Database report writing for	OJT in Microsoft Access report generation and queries	CIM computer operators
Lessons Learned 2 nd quarter	CIM lessons learned	CIM staff
CIM Manual	CIM manual reviewed	Selected CIM Staff

5 ISSUES

Procurement

79. Procurement is still one of the major problems in PIO 1, ie getting the money released to carryout the necessary purchase of equipment and consumables. The prototype is actually running on credit for all consumables and the TA applaud the management for arranging this so that the project can continue to function, but this is not what should happen.

Staffing

80. The CIM area never had the capability to handle the requirements of the project until recently and that was only due to constant pressure from the TA’s. It seems that in the majority of cases the section managers are reluctant to approach upper management for extra personnel to ensure that production meets the projects needs. They are more likely to not take the initiative to come forth and indicate what the problems are. It should be noted that once those steps were taken the upper management promptly supplied the staff.

Equipment

81. When producing as many CIM as PIO 1 have, and especially when the drafting material is very destructive on the technical pens used, the nibs, which are relatively cheap, should be exchanged more frequently than at present due to the abrasive material actually wearing out the nibs and thus causing the lines drawn to be physically become thicker.

Management

82. The project planning of the CIM unit is much to be desired, there is more thought put into physically producing the CIM than planning when, where, who and how the CIM will be produced. It is essential that this area is strengthened so that it can function smoothly without TA input.

83. QA is still lacking and more time and effort needs to be directed in this direction.

6 LESSONS LEARNT

84. Post limitations overcome with technical standards were:

- There was no CIM manual so the unit just proceeded without any guidance;
 - Varying CIM scales, ie not at the standard scale requirements;
 - CIM were only within barangay boundaries;
 - CIM UPI numbering was by barangay not by CIM sheet;
 - CIM UPI was from the bottom of the sheet;
 - No unique CIM numbering system;
 - Cross hachuring on CIM which made it difficult to see all the information;
 - No standardisation of CIM layout or contents;
 - Bad presentation of information within the CIM and legend;
 - CIM not to International Best Practice;
 - CIM production lacked the needs of the project;
 - Bad planning re project needs and lack of personnel to attend to the needs;
 - Lacking in supervision;
 - Lacking of QA.

85. These limitations have been overcome to some extent, but there needs more input into supervision and QA.

F RECORDS MANAGEMENT

1 OBSERVATIONS

86. Development in survey records management has not improved over the last 30 years or more, in fact the production of new records every year has caused greater pressure on records administrators to keep pace in storing, handling and servicing the public with information. Inefficiency, neglect and sometimes irresponsibility has caused the loss, destruction and deterioration of records. It seems that agency managers do not appreciate the importance of a well managed records system. This is reflected by the following conditions:

- Lack of budget to operate records administration;
- Inadequate space for records;
- Poor technically trained personnel in records management units;
- Lack of equipment and materials for records maintenance and reconstruction.

DENR

87. The inspection of the survey records in both Region 8 and NCR has the following common observations:

- Space used is too small for the volume of records in place, elevated racks and stands to the ceiling are fully stacked, small passageways are sometimes filled with records that are bound or bundled into sacs.



- The methodology of storage especially the survey plans leads to plans being folded, rolled and just pushed into what space is available, this leads to fast deterioration and defacing;
- There is no complete inventory of records;
- Deteriorating records are left to rot;
- Reconstruction of missing and deteriorating records needs to be prioritised;
- Training of records personnel is required;
- The records system lacks budget, equipment, materials, space and personnel;
- Inefficient records servicing is common especially when improperly kept and do not have an inventory;
- Significant volume of records are missing;
- Security copy of NCR records are kept in the same location;
- Filing system of maps and plans leaves much to be desired;
- Most records have no duplicate copies stored in another location, which poses a complete loss in case of fire.

DAR

88. The DAR survey records are limited compared to DENR. Basically they are mostly copies of surveys of lands covered by CARP¹, emancipation patents and political boundary surveys by LBM. The survey data is being transformed and projected into a spatial framework bounded by barangay and municipal boundaries to produce municipal and provincial index maps. The spatial data also includes CLOA²'s, land use information and surveyed lots under voluntary offer to sell and compulsory acquisition.

89. Note the system is primarily a LIS³ which can be incorporated into a GIS⁴ at a later stage;

¹ Comprehensive Land Reform Program

² Certificate of Land Ownership Award

³ Land Information System

⁴ Geographic Information System

DAR at the time of interview had no data within the pilot area.

PIO 1

90. On the International TA's first visit to the prototype, it was recognised that a single table database was in place but no real thought was given to its structure and the records themselves.

91. The various agencies do not have a computerised database of the required data for the project; consequently the records were taken from the manual entries from various books. Of the 138000 odd records retrieved, the problems associated with the data after entry into the database are:

- data that could not be related to a parcel of land;
- data had barangay names that no longer existed;
- not all data pertaining to the project was being captured;
- there was no verification of data, ie QA;
- associated disciplines were using Excel spreadsheets instead of the database;
- there was no real communication between the different disciplines re the data;
- the database would not be suitable for the prototype nor the LAM Program in the rural environment.

92. From the above it was essential that a new database be designed and implemented to suit the structure of the project and LAM Program.

93. There is no dedicated server for the running of the database, in fact for the whole OSS. It is planned to use one of the TA computers as a server until this issue is resolved.

94. It is planned to offer the section of the database that pertains to the participating agencies, and who wish to computerise their records, alterations to the tables and forms will be made if the agencies accept and require further fields to be inserted.

2 ACHIEVEMENTS

95. A new database was designed and with the help of one of DENR's system analysts, was re-coded to its present form. The database consists of many relational tables, each referring to the various agencies involved or other disciplines within PIO 1 and linked by a cross index..

96. The database has been installed and the fine tuning is now taking place. Extra staff have been employed to verify the data and obtain the missing information from the municipalities and agencies. The records are being filtered so that no erroneous data will be present within the database. All duplicate records are being examined to ascertain if they are in fact duplicate or bad data entries.

97. Considering the volume of records that are contained within the database, it will be some period of time before all records are filtered and considered correct.

98. The database will respond to queries that are required by all other units within the prototype when pertaining to any parcel once the cross index has been applied. The cross index is the CIM sheet number plus the unique parcel identifier (UPI).

99. A manual has been produced for the database operations.

G CONCLUSIONS

Cadastral Surveying

100. The condition of rural cadastral surveys in the Philippines (as shown in Leyte and Quezon City) is much to be desired and fraught with problems from:

- inadequate survey instruments being used;
- quality and the capability of survey parties;
- in some cases manipulation of survey results before presenting them to the authorities;
- in certain cases the lack of professionalism within the survey industry.

101. Unfortunately this part of Activity 11 has fallen short of the intended expectations of the project due to no survey contracts being awarded under the World Bank loan and commenced during the International and National TA's appointment to the project.

102. The role of effective project management was not given appropriate attention.

103. Significant delays in procurement of critically needed equipment such as the total stations and GPS receivers hampered and delayed project execution.

104. Orthophoto maps have not been completed and the satellite imagery was not procured

Cadastral Index Maps

105. Apart from the problems that are present, the CIM unit is functioning better than expected, and has proved that the rural CIM production is feasible using hand drawn methods.

106. The CIM unit still needs extra training in two areas:

- Production Management
- QA

107. There is still the need to test alternate methods of CIM production.

Records Management

108. The survey records management of DENR is inefficient and lacks the appreciation of the records management and its major roll in security, storage and client servicing.

109. DAR appears to be in the process of updating its records and administration; it has more technical people involved and has gone into computerising its survey data.

110. The ROD does not use cadastral maps at all.

111. PIO 1 is operative and the records management issue has been addressed through the database. Recommendations have been made as to the correct storage of paper based records such as CIM, survey plans and records.

H RECOMMENDATIONS

Cadastral Surveying

112. It is recommended that:

- Studies and evaluation of procedures that were not able to be tested, and that further studies are conducted in the next two consecutive quarters;
- Upgrading of the basic skills base of the survey industry is carried out prior to and during the implementation of the LAM Program, this would entail upgrading of the university programs and the introduction of technical colleges;
- DENR Administrative Order No. 98-12 should be thrown out. A recompilation of the Order and a more flexible approach to types of valid cadastral surveys be introduced, and the Order does not read like a text book and is separated into:
 - Survey Act;
 - Survey Regulations, Recommended Guidelines and Practices;
- The programme management of cadastral projects be improved, and simplify the procedures but be more stringent in the execution of the procedures;
- Considering the limited capacity of NAMRIA and the failure to adhere to contractual deadlines, it should be considered that for the LAM Program, international tenders be obtained for both the GPS and orthophoto map production;
- The procurement system needs to be revised to allow flexibility in the changing project needs to support the projects objectives;

Cadastral Index Maps

113. It is recommended that the following areas be addressed:

- There is on going training in:
 - Production Management;
 - QA;
 - Alternate methods of CIM compilation.
- The procurement issue be addressed;

Orthophoto Maps and Associated GPS Surveys

114. It is recommended for the LAM Program that:

- International tenders are sought for the production of orthophoto maps and associated GPS control.

Records Management

115. It is recommended that:

- The records from DENR need to be scanned for archival purposes.
- Records administration should be addressed throughout all participating agencies.
- A server is purchased for PIO 1 which will also accommodate the OSS, ROD and CENRO.



One Stop Shop and PIO1 accommodation



Front Desk One Stop Shop

end of report.

TERMS OF REFERENCE

INTERNATIONAL LAND PARCEL MAPPING ADVISER

First Part of Long Term Assignment (2001/2002)

The Land Parcel Mapping adviser to the LAMP Project will work at both Prototype 1 (Leyte) and 2 (Quezon City). The exact timings will be determined month by month depending on the work needs. It is expected that slightly more time will be spent at prototype 2.

The adviser will report to the TA team leader. The Land Parcel mapping adviser will work closely with Project counterparts at each Project site.

The approach at all times will provide the Project with best practice, a safe working situation and be Gender sensitive. The adviser will cooperate with the members of the Quality Assurance Panel whose job it is to verify that TA outputs are of a suitable standard and completeness. To this end, the adviser shall maintain an up to date work plan and have regular review meetings with counterparts on progress, issues and changes to the plan. A monthly report will be submitted to the team leader.

This TOR addresses the first 6 months of the assignment. A new TOR will be prepared for the later stages of the assignment.

The International Land parcel mapping adviser will be responsible for completing the following work no later than 30 June 2002 (reference is the PDD and the work to be completed is described as Deliverables 11 and 13 in the AusAid – AMC contract):

1. The overall task in prototype 1 is to assist in the development, training, testing and documenting of procedures and methods for mapping land parcels prior to land titling, during systematic land titling and at the time of land registration in order to support the overall first time issuing of land titles. A number of survey methods are planned to be used including ground surveys, photomaps and satellite imagery. The various survey plans and maps being produced will be reviewed and improved and training provided. The process of parcel mapping must be smoothly integrated with the other titling activities. The mapping should be on the standard national coordinate system. Quality assurance must be built into the processes. Training and workshops will be a feature to obtain consensus on new approaches and for technical skills upgrade. Any additional equipment to improve the work outputs are to be reported. It is planned that both judicial and administrative titling (possibly free patents if an amendment to the concerned Commonwealth Act is passed) will be implemented in target test Barangays. Further, assist the OSS and ROD so that the CIM and other land records are integrated into normal work processes and especially, that they are used to avoid errors in issuing fake or overlapping titles. Assist on presenting results and recommendations to the LAG and PMO.
2. The overall task in prototype 2 is to assist in the development, documenting and training on methodologies and processes to create CIM from existing map data in offices of participating agencies, using survey information and orthophotos to control the mapping process. Evaluate and report on the quality and completeness of existing survey data held by various agencies. Include a method to ensure that any land parcel sub-divisions / consolidations are captured onto the CIMs. The CIMs are to be fundamental to the identification of fake, duplicate and missing titles in the Quezon City pilot area and the processes should be integrated with other prototype processes. The integration of the CIMs into the OSS and the ROD is a key task in order for the quality of the records to be

sustained into the future. The approach will involve community groups in all stages of the work in addition to the PIO2 agencies.

3. The priority and specific outputs from the adviser are:
 - a) Prototype 1: Report covering the following. documentation and training on initial procedures and methodologies for land parcel survey and mapping in the Judicial Pilot, and evaluation report on progress in the implementation focussing on obstacles and solutions and lessons learned;
 - b) Prototype 2: Report covering the following. documentation and training on initial CIM compilation and use in records quality improvement in related agencies and especially in the ROD. Testing of the quality to be reported. Lessons learned from workshops to be reported. Further development to be recommended.
4. Document the procedures and produce operational manuals. Prepare relevant training programmes and assist in staff training and training evaluation.
5. Provide assistance in the development of a strategy to design and operationalise the OSS.
6. Work with stake holders to develop strategies, organisational linkages and relationships that support Prototype activities.
7. Assist the PMO and PIO2 in interactions with the BOO project in LRA.

End

TERMS OF REFERENCE

NATIONAL SURVEY AND MAPPING ADVISER

First Part of Long Term Assignment (2001/2002)

The Survey and Mapping adviser to the LAMP Project will work primarily at Prototype 1 (Leyte) and only as required on specific assignment at PIO2 (Quezon City).

The adviser will report to the TA team leader and work as a team with the other TA advisers, in particular the international land parcel mapping adviser and systematic registration adviser. The adviser will work closely with Project counterparts.

The approach at all times will provide the Project with best practice, a safe working situation and be Gender sensitive. The adviser will cooperate with the members of the Quality Assurance Panel whose job it is to verify that TA outputs are of a suitable standard and completeness. To this end, the adviser shall maintain an up to date work plan and have regular review meetings with counterparts on progress, issues and changes to the plan. A brief monthly report will be submitted to the team leader.

This TOR addresses the first 6 months of the assignment. A new TOR will be prepared for the later stages of the assignment.

The overall task in prototype 1 is to assist in the development, training, testing and documenting of procedures and methods for mapping land parcels prior to land titling, during systematic land titling and at the time of land registration in order to support the overall first time issuing of land titles. A number of survey methods are planned to be used including ground surveys, photomaps and satellite imagery. The various survey plans and maps being produced will be reviewed and improved and training provided. The process of parcel mapping must be smoothly integrated with the other titling activities so that the maps are directly used to control mistakes in duplicating surveys and patent and title issuing. Access to CENRO information is important for identifying earlier surveys and LRA for earlier title registration.

The mapping should be on the standard national coordinate system (PRS 92). Quality assurance must be built into the processes. Training and workshops will be a feature to obtain consensus on new approaches and for technical skills upgrade. Any additional equipment to improve the work outputs are to be reported. It is planned that both judicial and administrative titling (possibly free patents if an amendment to the concerned Commonwealth Act is passed) will be implemented in target test Barangays.

Further, assistance is to be provided to the OSS and ROD so that the CIM and other land records are integrated into normal work processes so that they are used to avoid errors in issuing fake or overlapping titles. Assistance is to be given on presenting results and recommendations to the LAG and PMO.

Further, assistance will be provided to ensure that the land lot surveys are performed to suitable levels of accuracy and completeness and well documented. This is to include instructions on standard recording of occupations; i.e. boundary monuments, both artificial and natural. Assistance on methods to test and accept the work of the private sector and better filing and keeping of the valuable survey records.

Together with the other TA advisers develop better ways to streamline the overall process of survey, adjudication and office processing, leading to land title registration.

Work together with the systematic land registration adviser to design and document more efficient processes for free patent issuing and registration (this assumes that the Free patent Law will be passed).

The overall task in prototype 2 is to assist in the development, documenting and training on methodologies and processes to create Cadastral Index Maps (CIM) from existing map data in offices of participating agencies, using survey information and orthophotos to control the mapping process. Evaluate and report on the quality and completeness of existing survey data held by various agencies. Include a method to ensure that any land parcel sub-divisions / consolidations are captured onto the CIMs. The CIMs are to be fundamental to the identification of fake, duplicate and missing titles in the Quezon City pilot area and the processes should be integrated with other prototype processes. The integration of the CIMs into the OSS and the ROD is a key task in order for the quality of the records to be sustained into the future. The approach will involve community groups in all stages of the work in addition to the PIO2 agencies.

The national survey and mapping adviser will be responsible for completing the following work no later than 30 June 2002 (reference is the PDD and the work to be completed is described as Deliverables 11 and 13 in the AusAid – AMC contract):

8. The top priority specific outputs from the adviser are:
 - a) Prototype 1: Assist the International land parcel mapping adviser to prepare a report covering the following; documentation and training on initial procedures and methodologies for land parcel survey and mapping in the Judicial Pilot, and evaluation report on progress in the implementation focussing on obstacles and solutions and lessons learned. Training summary report;
 - b) Prototype 2: Assist the International land parcel mapping adviser to prepare a report covering the following; documentation and training on initial CIM compilation and use in records quality improvement in related agencies and especially in the ROD. Testing of the quality to be reported. Lessons learned from workshops to be reported. Further development to be recommended.
9. Document the procedures and produce operational manuals for survey and mapping to support the Judicial Titling pilot. Prepare relevant training programmes and assist in staff training and training evaluation.
10. Provide assistance to operationalise the OSS at Leyte.
11. Work with stake holders to develop strategies, organisational linkages and relationships that support Prototype activities.

End

Annex 3

