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**MINISTRY OF PLANNING  
AND FINANCE**

**MYANMAR MINERAL AND  
GEMSTONES CADASTRE SYSTEM  
CONCEPTUAL DESIGN**

**CONTRACT No. MEITI-CS 003/2017**

**INTERMEDIATE DIAGNOSTIC REPORT**



**MYANMAR**  
**MEITI** Extractive  
Industries  
Transparency  
Initiative

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## INDEX

<b>ACKNOWLEDGEMENTS</b> .....	5
<b>0.- EXECUTIVE SUMMARY</b> .....	6
<b>1.- INTRODUCTION</b> .....	20
<b>2. DIAGNOSTIC BACKGROUND</b> .....	22
<b>3. DIAGNOSIS OF CARTOGRAPHIC AND GEODETIC INFRASTRUCTURE</b> .....	26
3.1.- THE EXISTING INFRASTRUCTURE .....	26
3.2. IMPLICATIONS OF THE CARTOGRAPHIC AND GEODETIC SITUATION FOR THE IMPLEMENTATION OF A CADASTRAL GRID AND THE CADASTRAL MANAGEMENT .....	29
3.3.- THE SITUATION IN MYANMAR .....	31
3.4.- PROPOSED SOLUTIONS .....	34
<b>4. THE INSTITUTIONAL ORGANIZATION</b> .....	36
4.1.- DESCRIPTION OF THE INSTITUTIONAL UNITS PARTICIPATING IN LICENSING.....	36
4.1.1.- <i>Geology and Mineral Exploration Department (DGSE)</i> .....	36
4.1.2.- <i>Department of Mines (DOM)</i> .....	37
4.1.3.- <i>Myanmar Gems Enterprise (MGE)</i> .....	38
4.1.4.- <i>Mining 1 and Mining 2 Enterprises</i> .....	39
4.2.- EVALUATION OF THE PRESENT INSTITUTIONAL ORGANIZATION .....	39
4.3.- EVALUATION OF THE DECENTRALIZED INSTITUTIONS .....	42
4.3.1.- <i>The DOM Regional Office in Mandalay</i> .....	42
4.3.2.- <i>The MGE Regional Office in Mogok</i> .....	43
4.4.- CONCLUSIONS AND PROPOSED SOLUTIONS.....	43
<b>5. TECHNICAL AND HUMAN CAPACITIES</b> .....	45
5.1 EVALUATION OF THE INSTALLED CAPACITY <b>IN CENTRAL UNION ADMINISTRATION</b> .....	45
5.2 <b>EVALUATION OF THE INSTALLED CAPACITY IN DECENTRALIZED UNION ADMINISTRATION</b> .....	48
5.3.- CONCLUSIONS AND PROPOSED SOLUTIONS.....	51
<b>6. EVALUATION OF THE LEGAL FRAMEWORK</b> .....	53
6.1 THE LAW AMENDING THE MYANMAR MINES LAW NO. 72/2015 .....	53
6.2.- THE MYANMAR GEMSTONE LAW (LAW NO. 8/95) .....	57
6.3 REGULATIONS (MYANMAR MINES RULES, NOTIFICATION 125/96).....	58
6.4.- NEW DRAFT REGULATIONS (DRAFT MINING RULES) .....	60
6.5.- <b>COMPARISON BETWEEN TWO METHODOLOGIES FOR GRANTING: FIRST-COME, FIRST-SERVED VERSUS AUCTIONING</b> .....	62
6.6.- CONCLUSIONS AND RECOMMENDATIONS.....	66
<b>7. STRUCTURE OF THE MINERAL RIGHTS</b> .....	69
7.1.- ANALYSIS OF THE EXISTING MINERAL RIGHTS .....	69
7.2.- CONCLUSIONS AND RECOMMENDATIONS.....	73

<b>8. DIAGNOSIS OF THE CADASTRAL PROCEDURES</b> .....	74
8.1. PROCEDURES FOR APPLICATION AND GRANTING OF PROSPECTION, EXPLORATION AND MINING LICENSES.....	74
8.2.- CONCEPTUAL STATEMENTS ABOUT PROCEDURES FOR APPLICATION AND GRANTING OF PROSPECTION, EXPLORATION AND MINING LICENSES .....	77
8.3. PRACTICAL AND OPERATIONAL CONCEPTUAL STATEMENTS ABOUT PROCEDURES FOR APPLICATION AND GRANTING OF PROSPECTION, EXPLORATION AND MINING LICENSES.....	78
8.5. PROCEDURES AT STATE AND REGION LEVEL .....	81
8.5.- PROCEDURES FOR GEMSTONE LICENSES.....	81
8.6. CONCLUSSIONS AND RECOMMENDATIONS.....	84
<b>9. STATUS OF THE CADASTRAL DATA AND LICENSING SITUATION</b> .....	88
9.1.- STANDARD PERMITS .....	88
9.2.- GEMSTONE PERMITS .....	91
9.3.- CONCLUSSIONS AND RECOMMENDATIONS .....	93
<b>10.- ADDITIONAL COMMENTS</b> .....	95
10.1.- COMPLEMENTARY DOCUMENTS.....	95
<b>10.1.1.- MEITI reconciliation report 2014-2015 (draft version 240118)</b> .....	95
<b>10.1.2.- Draft mining policy</b> .....	95
<b>10.1.3.- Relationships between cadastral information and ownership beneficiary</b> .....	96
<b>10.1.4.- Natural resource Federalism, considerations for Myanmar (NRGI Myanmar Resource Briefing)</b> .....	97
<b>10.2.- CONCEPTUAL BASIS FOR A GEOLOGICAL SURVEY STRATEGIC PLAN</b> .....	98
<b>11.- PRELIMINARY IDEAS ABOUT THE ROADMAP TOWARDS THE NEW COMPUTERIZED CADASTRE</b> .....	101
11.1- THE INTERNATIONAL EXPERIENCE .....	101
11.2.- THE APPROACH REQUIRED IN MYANMAR .....	104
<b>11.3.- PRE – CADASTRE ACTION PLAN</b> .....	105
<b>11.3.1. Objectives. Technical description</b> .....	105
<b>11.3.2.- Pre-cadastral team. Required profiles and skills</b> .....	107
<b>11.3.3.- Strategy for implementation</b> .....	107
<b>ANNEXES</b> .....	109

## ABBREVIATIONS AND ACRONYMS

AG	Attorney General
<b>ALARM</b>	<b>Advancing Life &amp; Regenerating Motherland</b>
CMCS	Computerized Minerals Cadastre System
CU	Cadastral Unit
DGSE	Department of Geological Survey and Mineral Exploration
DOM	Department of Mines
EIA	Environmental Impact Assessment
EITI	Extractive Industries Transparency Initiative
EMP	Environnemental Management Plan
GCP	Ground Control Points
GDP	Gross Domestic Product
GIS	Geographical Information System
GPS	Global Positioning System
ITRF	International Terrestrial Reference Frame
<b>MATA</b>	<b>Myanmar Allianz Transparency &amp; Accountability</b>
MC	Ministry of Commerce
MCRB	Myanmar Center for Responsible Business
MCMS	Mineral Cadastre Management System
MGE	Myanmar Gem Enterprise
MONREC	Ministry of Natural Res. and Environmental Conservation
MPF	Ministry of Planning and Finance
MRC	Mineral Rights Cadastre
<b>PSC</b>	<b>Production Shared Contracts</b>
TOR	Terms of Reference
TTL	Task Team Leader
UTM	Universal Transverse Mercator
WGS	World Geodetic System

## **ACKNOWLEDGEMENTS**

During his visit the Consultant met officials from Ministry of Planning and Finance (MPF) linked to the EITI-Myanmar and all relevant units linked to mineral licensing activities within the Ministry of Natural Resources and Environmental Conservation (MONREC) and related agencies. The Consultant wishes to express their gratitude for the excellent cooperation of these Government officials and consultants and take this opportunity to thank all concerned staff for the assistance and hospitality given to the Consultant during his stay in Republic of the Union of Myanmar (see the list of visited agencies and officials in ANNEX I). Additionally, the Consultant benefit also of the data compiled by previous works **and reports** (see the list of reports in ANNEX II).

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## **0.- EXECUTIVE SUMMARY**

Mr Enrique Ortega, Mineral Rights Cadastre Expert, visited The Republic of The Union of Myanmar from 30<sup>th</sup> October to 11<sup>th</sup> November 2017 and from 11<sup>th</sup> to 23<sup>rd</sup> February 2018 to undertake the consultancy for the conceptual design for the **MYANMAR MINERAL AND GEMSTONES CADASTRE SYSTEM**, working closely with Ministry of Planning and Finance (MPF) and the Ministry of Natural Resources and Environmental Conservation (MONREC). The main purpose of **these two missions** was to develop a preliminary diagnostic on the status of the system and methodology for licensing mineral rights in the Republic of the Union of Myanmar and to suggest solutions for improvement. In accordance with the prescriptions detailed in the Terms of Reference (TOR), the diagnostic was to cover an assessment of the following:

- a) Review the cartographic and geodetic basis supporting the delimitation and positioning of the mineral rights.
- b) Review the institutional organization responsible for licensing activities.
- c) Evaluation of human and technical capacities (staffing, equipment and infrastructure)
- d) Review the legal and regulatory framework prescribing and management of the mineral rights.
- e) Evaluation of the structure of the Mineral rights
- f) Review the licensing procedures in comparison with the best international practices.
- g) Evaluate the situation of cadastral information, data and files. Assess the present computerized system in reference to other systems commonly used for licensing management.

**During the second mission, the main activities have been focused on:**

- To visit the decentralized units of MONREC in Mandalay and Mogok, including field visits to several mining sites.
- To visit again the MONREC departments in order to improve the knowledge and understanding on the licensing procedures.
- To interact with civil society organizations and consultants developing activities related to the Myanmar mining sector.

- To explain the main findings in diagnostic and proposed solutions to the Myanmar political authorities.

## CARTOGRAPHIC AND GEODETIC INFRASTRUCTURE

The topographic maps used in Myanmar for licensing are very old, they are not compatible with GPS and the existing algorithm for transformation is not enough accurate. The solution for these problems requires the immediate migration of the mineral rights perimeters towards a unified and modern map, where the potential overlapping can be checked without error and where it would be possible to have a complete overview of the cadastral situation of the country for all the types of licenses. This migration would imply:

- To adopt the 1:50.000 UTM as official cadastral maps.
- To improve the accuracy of the available transformation algorithms between maps (Lambert and UTM) and GPS coordinates, using the methodology based on polynomial transformation, facilitating the positioning of the mineral licenses on the field.

To acquire this capacity and based on the international experience in countries where faced the same type of problems, it is necessary to check if the available high accuracy geodetic network is enough to calculate the algorithm with the required accuracy. On this respect, it has been already approved by the MEITI cadastre sub-committee to propose to MONREC, with cooperation of the Survey Department, the implementation of the following sequence of activities:

1. To check if the accuracy of the presently available transformation can be improved by the calculation of a new algorithm using polynomial methodology, without additional fieldwork and merely using the existing data in the same way that it has been recently realized in Mozambique, Zambia, Nigeria, Burkina Faso and Guinea Conakry.
2. If it is not sufficient, to realize field measurements of additional points belonging to the primary geodetic network.
3. Calculation of a new algorithm.
4. Transformation and migration of the existing Lambert cadastral maps towards the new UTM maps.

All these activities should be developed under close cooperation with the Survey Department as institutionally responsible for the Myanmar geodetic network. It should be highlighted that Survey Department already accepted to cooperate in the proposed planning under condition of previous authorization of MONREC's minister.

Finally, it shall be taking into consideration that the availability of accurate transformation algorithm will represent an immediate improvement not only for licensing purposes and the improvement of the mining sector management, but also for any GPS user in the country (forest, environment, agriculture, civil works, geological mapping, etc.). Furthermore, it should be also mentioned that the proposed solution would be totally convergent and compatible with the objectives of the ONEMAP project.

## THE INSTITUTIONAL ORGANIZATION

The present institutional organization of MONREC, as ministry responsible for the management of the mining sector and in relation to licensing mineral rights, does not fulfil the international standards of separation between monitoring the activities and granting the mineral rights. In practical terms, there is a substantial mixture of responsibilities because all the departments under the Mining Sector Permanent Secretary are in one or other way participating in licensing activities.

As consequence, there are potential conflicts of interest and it is not possible to guarantee the objectivity, the transparency, the equity and the fairness in decisions affecting the granting of mineral rights. This comment is applicable to the entire mining sector, but it is specially indicated to the gemstones, where the MGE commercial interests and responsibilities are intermixed with licensing and regulatory responsibilities. The only solution to correct these problems is to modify the present organization of MONREC under the following principles:

- a) To create a new unit named “Mineral Rights Cadastre” with exclusive responsibilities for licensing, including the reception and registration of applications, the verification of eligibility, checking the overlapping, evaluating for granting or submission to granting authority and maintenance of the mineral rights (renewal, transfer, extension, expiration, etc.).
- b) To take out the licensing activities from their present institutional position in DGSE, DOM and MGE, being transferred to the new “Mineral Rights Cadastre”.
- c) The unified integration of licensing procedures within the “Mineral Rights Cadastre” does not must imply a single procedure for the licensing of each mineral right, that must preserve the differences established in the present laws for standard mineral in laws.
- d) In addition, it must be established different procedures for exploration and mining rights.
- e) The statements c) and d) above, must no avoid the availability of integrated cadastral information in a unified cadastral database, SIG and cadastral maps.



## TECHNICAL AND HUMAN CAPACITIES

The present cadastral management of mineral rights in the Republic of the Union of Myanmar is far away from the international standards. In fact, many of the detected problems are closely related to the inadequate institutional organization, the ambiguous regulatory framework, the complexity of the procedures and the lack of equipment. This situation affects seriously the operational capacity of the existing resources and the quality of the management. The licensing methodology needs a deep revision in practical aspects related to the codification and filing and furthermore, the computer equipment and human skills are in need of upgrading in regard to the licensing matters. The efforts to improve capabilities must be focused on:

- Adequate use of the computer tools, mainly for database and GIS exploitation.
- Understanding of institutional cadastral concepts and modern cadastral management rules.

In the opinion of the Consultant, the required training must be developed on two different levels:

- On the job training, specifically applied to the Myanmar licensing procedures.
- Study tours to countries that have succeeded in reforming the mining sector over the past two decades and where the positive impacts derived from these reforms—where the Mineral Rights Cadastre played an essential role—have been appreciated by mining investors and led to strong sector growth. These countries must be selected based on features and scales where the experience could be transferable to Republic of the Union of Myanmar.

Based on the observations realized during the second mission, it can be stated that under the present conditions, it is impossible the accomplishment of all the inspection duties that would be required for guaranteeing the fulfilling of the mandatory obligations by the miners because the inspection capacity is very limited. International experience demonstrates that lack of adequate field control and inspection produces systematic violations of the legal prescriptions as well as a marked tendency to decrease the value of the declared mineral production (and logically, the royalties to be paid), resulting in important losses to State income and a decrease in the credibility and the security of tenure. Such limitation has also incidence in the licensing procedures, not in the case of application for new titles but for extensions or renewals, where it is necessary to demonstrate the fulfilment of the obligations prescribed in law.

Finally, it must be also highlighted that the visits realized to the MONREC offices in Mandalay and Mogok does not allowed to learn about the decentralized steps in the licensing procedures, because such activities are exclusively executed in the region / states administrations. In order to complete properly the diagnostic, this evaluation must be unavoidably developed during the third mission, especially after the recent approval of the regulations, where it the partial decentralization of some licensing responsibilities.

## THE LEGAL FRAMEWORK

The analysis of the existing legislation is strictly required in order to know the basis for current licensing conditions and to suggest the required solutions to the issues detected in the present diagnostic. From the conceptual point of view, the evaluation of the legal texts represents a substantial part of the cadastral system evaluation, not merely for procedural aspects, but also for any legal prescription affecting the mineral rights, the security of tenure and the attractiveness for investments.

In relation to the management of the mining sector, the main difference between the Myanmar legal framework and the international standards is the existence of two different laws, one for the normal minerals and other for gemstones. It should be highlighted that other gemstone producer countries (as they are for instance Madagascar, Mozambique, Tanzania, South Africa, Namibia, Colombia or Brazil) have not such legal differentiation and the gemstone are managed by a single and unified act, normally called as minerals and mining bill or mining code.

The presently enacted legal texts (laws and rules) have substantial gaps and ambiguities in relation to the international standards, making impossible an efficient and modern management of the licensing activities and affecting the transparency as well as the security of tenure and the attractiveness of the Myanmar mining sector for investments. Nevertheless, the present situation, where the recently amended laws have been not yet complemented with regulations, open an excellent opportunity to correct some of the detected gaps and to modernize the licensing methodology introducing corrections and improvements in the draft rules under preparation. In addition, this situation would give the opportunity to integrate the licensing procedures for gemstones and minerals in a unified scheme, allowing the coordination and harmonization and avoiding overlapping problems. In the Consultant's opinion and based on the international experience, the aspects or items below (restricted to the issues related to licensing and cadastre) that can be corrected or improved in new regulations are listed:

- To introduce of clear institutional definitions of the Minerals Rights Cadastre, describing in detail their functions and responsibilities, and establishing the "Cadastre" as the unit with exclusive responsibilities for licensing, including the reception and registering of applications, the cadastral evaluation of the application and communication with applicants and holders in relation to any

matter related to the mining rights, correcting the present situation where responsibilities are ambiguously split between several departments.

- To declare explicitly that information concerning the mineral rights (including the positioning on the maps) should be public and transparent, open for public consultation.
- To introduce objective criteria to be applied for evaluation of the applications to the mineral rights, in order to avoid subjective and discriminatory decisions for granting or refusal (as for instance minimum spend rules depending on size of concession as a minimum amount of dollars to be spent per year in each granted hectare), increasing the security of tenure.
- To remove the ambiguities about the application of tender bids, prescribing in detail when a license should be granted by auctioning or by first come, first served, and giving details also about the procedures to be followed for bidding. For instance, tendering will be applicable in the special cases of the areas where the resources have been discovered by the State or where the information corresponds to the public domain. Regulations must provide also details about when and how to initiate auctioning, how to organize auctions and the requirements which should be published in advance in order to guarantee the transparency. In addition, as one of the standard licensing procedures, it should be the Mineral Right Cadastre's responsibility to initiate, develop, and grant the corresponding license.
- To introduce a better differentiation between licensing procedures for prospection / exploration and mining because they have very different requirements, needs and conditions (registration of priority, duration, receivability, risk of violation of confidentiality, etc.).
- To introduce specific cadastral procedures for creation of gemstone tracts and reserved zones, preserving the rights of existing titleholders and previous applicants.
- To prescribe standard conditions for the licenses (duration, exclusivity, fees, state participation, etc.), avoiding negotiations for agreements. International experience demonstrated that standard prefixed conditions are the best solution to avoid discretion, subjectivity and corruption, increasing transparency and security of tenure.
- To establish the obligation to submit applications personally and the mandatory use of a paper registry (ledger or log-in book) exclusive for cadastre purposes, where only the applications for mineral licenses should be registered, including the double signature (applicant and cadastre agent).

- To determine without ambiguities the conditions (minimum data and information) for considering receivable an application, avoiding ambiguities and discretionary decisions.
- To restrict the application of Mineral Feasibility Study Permit to the holders of exploration permits and the areas explored during the period validity of the license.
- To introduce different level of activities (large, medium or small scales) also to facilitate the possibility the exploration projects. Under the present regime, all the scales are mixed under the same procedure, avoiding the adequate treatment and monitoring in relation to the size of the granted area and the scale of the operation. Furthermore, the present types of license, the activity is practically restricted to the areas where the presence of gems is known since decades ago and there are not exploration activities searching for new deposits or new potential areas.
- To include the cartographic and geodetic bases for the precise positioning of the mineral rights, prescribing the technical parameters to be used (coordinates, projection, spheroid and datum) in order to guarantee their uniform positioning, to avoid overlapping conflicts and to optimize the land management, adopting the 1:50.000 maps as cadastral maps and the UTM as cadastral coordinates.
- To introduce geometry restrictions for licenses, permits, tracts and blocks, avoiding the application and granting of aberrant or inadequate geometries, as for instance polygons containing empty spaces or polygons linked by their respective corners.
- To precise details about the procedures to be followed in several cadastral operations which are frequently required in the management of the mineral rights, as for instance the amalgamation between adjacent licenses or the division (splitting) of one licence in several titles, because the present legal framework is silent about such possibilities.

In the Consultant's opinion, it is extremely difficult to correct adequately the deficiencies listed above by simple amendments and it would be advisable to consider as option (if really it is desired to develop the mining sector) to consider the possibility for drafting a complete new legal framework, unifying gems and minerals in a single context, establishing the institutional basis for a mineral rights cadastre and implementing licensing procedures consistently to the international standards.

## STRUCTURE OF THE MINERAL RIGHTS

The structure of the minerals rights in Republic of the Union of Myanmar is far away from the international standards and the present situation is artificially complex,

making difficult the cadastral management, affecting the security of tenure and constraining the attractiveness of the country for investments. Unfortunately, the recently amended laws and the existing draft regulations are not correcting the detected problems.

However, taking into consideration that the law is silent in relation to these issues which are prescribed in the regulations, it would be relatively simple to improve the mineral rights structure by improvement of the draft rules in the following items:

- a. To increase the maximum size of the prospection licenses, allowing the development of modern large - scale prospection based on high - tech technology as airborne geophysics or remote sensing.
- b. To increase the minimum size of the small scale mining and gemstone licenses, adopting the international standards for a prefixed cadastral grid.
- c. To increase maximum allowed validity period for the exploration permits until 9 – 10 years, consistently to the world average duration for an exploration project and reducing the risk linked to advance the decisions for transformation into mining project.

## THE CADASTRAL PROCEDURES

The present methodology for licensing does not guarantee the rights of applicants and titleholders because is not transparent, is not efficient and do not preserve the priority. This situation creates double damage: for the administration (because of loss of credibility and rigor) and for the applicant because there are risks of losing priority and the discovery rights. The present bad practices may be undoubtedly the origin of cadastral problems and conflicts, and furthermore is affecting very negatively the attractiveness of the Republic of the Union of Myanmar for investments. Consequently, it is strongly recommended to modify the present licensing sequence in line with international standard methodology.

It should be reminded that some of procedural problems are created by the legal vagueness resulting from the Law and regulations; in particular the lack of specific criteria for evaluation of applications before granting introduces serious risks for security of tenure. Gaps in the institutional organization and the legal texts are transferred to the present licensing practice, and decisions for rejecting or granting are taken in the absence of precise guidelines on how to avoid subjective or potentially discretionary criteria. Additionally, the licensing procedures would be easily improved in conceptual and practical matters by implementation of simple changes, totally compatible with the existing legislation, as they are for instance:

- To make accessible to the public the cadastral maps and cadastral information, allowing to the applicants to know in advance the vacant areas available for new applications.

- To implement different procedures for the application for prospection, exploration and mining rights.
- To implement improvements in the registration methodology, introducing a model of Registry book able to be signed by the applicant and the Administration representative.
- To concentrate all the cadastre documents in a single and exclusive archive, where all the documents related to the licenses should be stored. For the normal daily work, the required information should be accessed digitally from the databases (when available), and when it is required to check or to consult the paper dossiers, such consultation should be realized in the archive, without withdrawing any document.
- To issue an application certificate immediately after the registration in order to provide to the applicant an official acknowledgement of receipt, duly stamped and signed, transmitting security on the chronology of the application.
- To improve the design of the licensing procedures, fixing deadlines in the intermediate steps in order to avoid unlimited waiting periods and avoiding also that MONREC loss of control when the dossier is transferred to the region / states administration.
- To improve the design of the licensing procedures, guaranteeing the respect of the legal texts and avoiding discretionary decisions without legal basis, as for instance the differentiation between large scale and small scale exploration licenses, or the arbitrary interpretation of articles 83 and 84 in Regulations, making mandatory the signature of a joint venture implying a "Production Shared Contract" and the acceptance of gratuity in the State participation. This mandatory condition has not legal basis and in practical represents an additional tax and the violation for the security of tenure, discouraging investments.
- To concentrate the cartographic position of all the existing rights in a single, unified and updated cadastral map based on UTM coordinates, allowing the adequate verification of overlapping. Such map must contain furthermore all the pending applications, as well as the areas restricted to the mining activities and the reserved zones (which presently are only the tracts for gemstones).
- To establish predefined deadlines for the intermediate steps in procedures, avoiding undefined waiting periods, uncertainties and discouragement of investors.

- To adopt an adequate codification methodology based on a single and unique numeric sequence, integrating all the types of licenses, and the file all the cadastral documents in single archive, being classified following this numeric code.

## STATUS OF THE CADASTRAL DATA AND LICENSING SITUATION

Table I shows the information corresponding to the whole of mineral rights existing presently in Myanmar, integrating the gemstone permits and the standard mineral licenses. The total number of permits (16,625) may give the impression that, consistently to the international standards, it is an intermediate scale cadastre, with a number of licenses adequate in relation to the size of the country.

License	Type	Number	%	% Total
Prospection		0	0,0	0,0
Exploration	Large scale	24	1,9	0,1
Exploration	Small scale	368	29,6	2,2
Mining	Large scale	153	12,3	0,9
Mining	Small scale	633	50,8	3,8
Mining	Subsistence	39	3,1	0,2
Mining	Feasibility	28	2,2	0,2
<b>Total Standard Minerals</b>		<b>1.245</b>	<b>100,0</b>	<b>7,5</b>
Gem	Private	15.016	97,6	90,3
	Joint venture	364	2,4	2,2
<b>Total Gems</b>		<b>15.380</b>	<b>100,0</b>	<b>92,5</b>
<b>TOTAL</b>		<b>16.625</b>		<b>100,0</b>

Table I

However, a detailed analysis of the percentages distribution for each type of license shows (by comparison with the international standards) extremely anomalous values:

- The number of licenses for large scale exploration of standard minerals is only the 0.1 % of the existing permits.
- The number of mining licenses for standard minerals is more than two times the number of exploration licenses. In addition, more than two thirds of the mining licenses correspond to small scale permits.
- The gemstones permits are nearly the 95 % of the licenses, but such extremely high percentage represents merely 118 km<sup>2</sup>, i.e. less than the 0.0002 % of the country.

This situation and these percentages are really unusual and very different by respect the standard values. The distribution of the different types of licenses evidenced a very anomalous situation of the licenses, with a great predominance of the small scale activities, a very low rate of exploration projects and minimum occupancy of the available territory. In the Consultant's opinion this situation is clearly related to the inadequacy of the present structure of the mineral rights (too short duration for exploration and too small size of the permits) and the lack of security of tenure of the present licensing procedures. The combination between these parameters creates a low attractiveness atmosphere for the development of the mining sector and gives rise to the present regrettable situation, where the Myanmar territory remains underexplored and the development of the mining sector is not proportional to the geologic and metallogenic potential.

In relation to the status of the cadastral data and documents, based on the previous statements and taking into consideration also the analysis realized in chapter 8, it can be concluded that the situation of the cadastral information is secured from the physical point of view, because the documents and the information are properly surveyed and maintained, and consequently there is no risk for losing or damaging documents. However, the methodology applied for coding and filing documents impedes the adequate, efficient and modern management and exploitation of the available information.

#### ADDITIONAL COMMENTS

As complementary information and in order to access to a more complete vision of the Myanmar mining sector, the Consultant revised also other documents, directly or indirectly linked to the licensing activities:

- The MEITI reconciliation report 2014-2015 (draft version 240118), commenting the absence of legal basis for mandatory joint ventures and the problems linked to the tender bids if they are adopted as standard method for granting.
- The Draft mining policy, including comments about the role of the State in exploration activities and the scale of the information to be acquired, the needs for differentiation between exploration and mining activities, the required caution in relation to the use of the term "online" in public websites, and the need of stable resources to guarantee the sustainability and the adequate management of the mining sector.
- To illustrate the best international experience to conciliate the relationships between cadastral information and ownership beneficiary. The design and the conception of the cadastral database must facilitate the access, in a transparent way, to the information related to the ownership beneficiary as required by EITI concepts, including the shareholders names and their respective percentage of participation, as well as the total number of existing shares.



- The NRG I Myanmar Resource Briefing on natural resource federalism, commenting the needs to differentiate adequately in the analysis the differences between exploration and mining activities, especially in relation to the licensing and potential interferences with land-use.
- To suggest the conceptual basis to conceive a strategic plan for the Geology Department, in order to reorient its institutional responsibilities towards the present social demands, considering also the needs for a clear and unambiguous policy for data diffusion.

#### PRELIMINARY IDEAS ABOUT THE ROADMAP TOWARDS THE NEW COMPUTERIZED CADASTRE

The situation of the licensing activities and the cadastral information in Myanmar requires urgent changes in several essential components affecting the application and granting of the mineral rights, as they are:

- a) To provide an accurate and reliable cartographic basis. This work is convergent with the on-going ONEMAP project.
- b) To integrate the cadastral information in a depurated and unified database (pre-cadastre). This work is convergent with the on-going NRG I project.
- c) To improve the draft regulations.
- d) To improve the institutional organization, creating a specific unit named “cadastre”.
- e) To develop and to implement new licensing procedures
- f) To computerize the new procedures

However, the required changes cannot be implemented simultaneously and taking into consideration the particular situation of Myanmar and the present circumstances of the different departments participating in licensing activities, it is recommended to implement a progressive and sequential approach.

However, the final design of the implementation sequence as well as the required implementation strategy will be conditioned by the level of commitment at political level to adopt the proposed changes. Obviously, the final cadastre design and new procedures cannot be the same if the new Cadastre department is created or no. However, during the present mission it has been stated the favourable position at uppermost level in MONREC in relation to the creation of this cadastre unit and it has been agreed to accelerate the access to an accurate and reliable cartographic basis and to initiate immediately the Pre – Cadastre activities. The objective of the pre –

cadastre is to create a complete and “clean” database (graphic and alphanumeric, linked into a GIS) where it should be properly loaded and codified all the existing mineral rights, as well as the pending applications. All the information will be properly re-codified and filed.

Based on the practical experiences in other countries, the more operational methodology to prepare the databases and to develop the activities described above is to create a working group, selecting the adequate members among the agents presently engaged in licensing activities (GSED, DOM and GED departments). These agents should be released of all the present responsibilities and duties and be devoted exclusively to the pre-cadastre activities. The selected agents must be experienced in licensing activities, having a deep knowledge of the present procedures. In addition, at least one of them must have knowledge or capacity on database and GIS software, topography or surveying (including use of GPS) and analysis of legal and regulatory texts

Complementarily, it would be advisable to have the support of an external expert, hired in Myanmar or in the region, experienced in design and configuration of computerized applications based on PC platforms with data base applications integrated with of data banks and geographical information system (GIS) applications related to the integrated treatment of alphanumeric and graphic data for mining or earth’s sciences in a GIS. The presence full time of this expert is not required, but he must visit periodically the local working group.

In order to facilitate the activities of the pre-cadastre working group, it will be habilitated a working space (pre – cadastre office) where they will have access to the required office tools (furniture, boards, copy machine, etc.) and computers linked by a local network, internet access and printer. It will be required within this working space a copy of the essential licensing documents for each title or pending application, as for instance the application form, granting letter, etc. The activity of the pre-cadastre working group will be developed in two steps:

- Phase 1, focused in all the licenses or pending applications for standard minerals and gemstone existing outside the gems tracks.
- Phase 2, focused on the gemstone licenses and pending applications inside the tracks. It would be advisable, in order to avoid duplications and to make shorter the creation of the database, to harmonize this activity with the work presently being developed by NRG I on this respect.

The development of the pre-cadastre activities will be profited as “training on the work” and, as well as the proposed reorganization of MONREC will be achieved and the new Cadastre department will be created, the pre-cadastre team will be assigned to the new department, and the licensing responsibilities presently under responsibility of GSED, DOM, GED, Mineral I and Mineral II departments will be transferred to the new cadastre department.

## 1.- INTRODUCTION .

Mr Enrique Ortega, Mineral Rights Cadastre Expert, visited The Republic of The Union of Myanmar from 30<sup>th</sup> October to 11<sup>th</sup> November 2017 and from 11<sup>th</sup> to 23<sup>rd</sup> February 2018 to undertake the consultancy for the conceptual design for the **MYANMAR MINERAL AND GEMSTONES CADASTRE SYSTEM**, working closely with Ministry of Planning and Finance (MPF) and the Ministry of Natural Resources and Environmental Conservation (MONREC). The main purpose of **these two missions** was to develop a preliminary diagnostic on the status of the system and methodology for licensing mineral rights in the Republic of the Union of Myanmar and to suggest solutions for improvement. In accordance with the prescriptions detailed in the Terms of Reference (TOR), the diagnostic was to cover an assessment of the following:

- h) Review the cartographic and geodetic basis supporting the delimitation and positioning of the mineral rights.
- i) Review the institutional organization responsible for licensing activities.
- j) Evaluation of human and technical capacities (staffing, equipment and infrastructure)
- k) Review the legal and regulatory framework prescribing and management of the mineral rights.
- l) Evaluation of the structure of the Mineral rights
- m) Review the licensing procedures in comparison with the best international practices.
- n) Evaluate the situation of cadastral information, data and files. Assess the present computerized system in reference to other systems commonly used for licensing management.

During the second mission, the main activities have been focused on:

- To visit the decentralized units of MONREC in Mandalay and Mogok, including field visits to several mining sites.
- To visit again the MONREC departments in order to improve the knowledge and understanding on the licensing procedures.
- To interact with civil society organizations and consultants developing activities related to the Myanmar mining sector.

- To explain the main findings in diagnostic and proposed solutions to the Myanmar political authorities.

The Consultant would like to stress that this is still a preliminary diagnostic report. As such, the report highlights weaknesses in the current system, detecting the most relevant issues and recommending the best solutions according to the needs of the minerals industry, the particularities of the Republic of the Union of Myanmar mining sector, and international best practice. This does not mean a simple transfer of experience from other countries to the Republic of the Union of Myanmar, because solutions adopted in one country are not directly exportable to another. In fact, the practical application of general and universally valid mineral rights cadastre principles (e.g., transparency, efficiency, non-discretion, etc.) must be carefully adapted to the circumstances of each country.

This report contains an evaluation of the Republic of the Union of Myanmar's cadastral system, cadastral organization, cadastral procedures, and available cadastral infrastructure; it is not an examination of the team engaged in the system or in the application of procedures. All the qualifications included in the report are related to the system and procedures themselves and not to the staff. The diagnostic is focused on a path for the Republic of the Union of Myanmar to implement a modern, computerized mineral rights cadastre. Given that computerization is closely related to legal, organizational, and administrative matters, the report explores relevant aspects of these issues.

Finally, the Consultant would like to remind also the meaning of the term "cadastre" for an adequate understanding of this report, because this word is still not used in the present Republic of the Union of Myanmar legal texts. In the international context, the word "cadastre" means all activities linked with licensing, including the applications, registry, granting, issuing, management, mapping, and field delimitation of mineral rights. In this report, the term "cadastre" (as well as the terms "cadastral activities," "cadastral procedures," "cadastral organization," "cadastral practice," etc.) is applied consistently with the internationally accepted concept.

## **2. DIAGNOSTIC BACKGROUND**

The Extractive Industries Transparency Initiative (EITI) is a global Standard to promote an open and accountable management of natural resources and Myanmar submitted its application to become an ‘EITI Candidate’ country in 2014, being approved within the same year. In 2016 Myanmar produced its first EITI Report and it is planned that Myanmar will publish its second EITI Report in 2018. In this respect, one of the key requirements of EITI is to maintain a publicly available Mineral Cadastral System and the first Myanmar EITI report noted that Myanmar’s current Mineral Cadastral System has important weaknesses, as for instance:

1. No consolidated list of mineral and gem licenses exists.
2. Existing licenses contain a number of incorrect datasets or miss essential information.
3. The mineral cadastre system is not available online.
4. Allocation and transfers of mineral rights are not computerized.
5. Intensive manual manipulation is required to extract the list of licenses.
6. Licenses are not systematically pre-numbered

Additionally, the EITI report recommended also that:

1. The Mineral Cadastre should ensure that all records are computerized and kept up to date.
2. An online cadastral system should be installed. The system should include information on coordinates of concessions and transfers of mineral rights as well as fees paid and other performance obligations. The ministry of mines should have official on-line cadastre maps with details of licenses.

Complementary to the EITI report, in 2016 a World Bank mission to Myanmar reported the actual situation of Myanmar Mining Cadastre System and the main conclusions of this mission were:

1. The current ministry in charge of managing mineral resources is the Ministry of Natural Resources and Environmental Conservation (MONREC). Before March 2016 this role was undertaken by the Ministry of Mines, now fully integrated in MONREC
2. In relation to mining in Myanmar there are two different laws, one for Gemstone mining and one for any other mining. Both laws have been

recently modified and approved, and in addition during the last few weeks the so-called Rules that provide implementing details of the mentioned laws have been also approved<sup>1</sup>.

3. Gemstone permits are managed by the state-owned Myanmar Gem Enterprise (MGE), which is reporting to MINES. Other mining permits are managed by MINES directly. To date there is no relation between the gemstone permits system and mining permits system. They follow independent procedures.
4. In 2016 the number of existing licenses was 21,392 production permits for gemstone and 1,595 (prospection + exploration + production) permits for mining. Gem permits are managed in a paper-based system, and they use local coordinates systems. Mining permits are also managed in a paper-based system using Lambert coordinates (British Maps dated on 1945). However, the official Myanmar coordinates system is UTM- Myanmar 2000.
5. Mapping authority of Myanmar is the Survey Department (MONREC). This Department has a digital cartography 1: 50000 (year 2000) and developed own procedures for conversion between coordinate systems and it maintains a geodetic network.
6. The department of Mines has some capabilities for digital storage of information. Alphanumeric information is stored in Excel files and approximately a half of permits are recorded in a GIS.

The 2016 World Bank mission concluded that Myanmar has sufficient elements to build a Cadastral System as per EITI requirements.

In the other hand, in addition to the statements listed above and complementarily to the EITI statements, it should be taking into consideration that the geological features of the Republic of the Union of Myanmar subsoil are sufficiently promising to suggest the development of mineral sector in the future and further potential lies in the continuing investigation of Republic of the Union of Myanmar's geology. However, without regulatory reform and capacity building the country will find it difficult to manage the sector effectively and consistently. Lessons from around the world emphasize that mineral sector growth will need to be managed wisely if it is not to result in economic mismanagement, inequitable sharing of benefits and disregard of the interests of the environment and communities. Economic policies and public financial management will have to be adapted to take into account the potential magnitude and volatility of mineral revenue flows and decide how revenues

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<sup>1</sup> However, the translation to the English of these regulations are not yet available and consequently, its evaluation cannot be included in the present report.

might be allocated. Mining must be developed to generate sustainable development outcomes, not boom and bust leaving a few winners and many losers.

In addition, the institutional changes mentioned above are also required to attract the flow of capital into exploration and production activities and to mobilize additional revenues to meet the Government budgetary requirements. Achieving the right balance between “attracting investments” and “maximizing revenues” is the central challenge economy wide, but especially so in the mining sector, where investment is attracted by a clear, consistent, transparent and stable policy and regulatory environment. A necessary condition for this is an efficient and reliable system under which mineral rights can be obtained and maintained. This is not a sufficient condition on its own, however. The Consultant recognizes that there are a range of other aspects of the mining sector environment that negatively affect investment decisions and will need to be improved. However, the focus of the present study is to diagnose what problems exist in the minerals licensing system and how this could be addressed by the Government.

During the last 25 years many countries, particularly in Latin America, Africa and Asia, made legal and institutional reforms in their mining sectors, to modernize sector management, attract investments and optimize the contribution of mining to their economies at the national and local levels. Some of these developments have led to impressive results, for example in Argentina, Chile, Mongolia, Ghana, Madagascar, Peru, and Tanzania. One of the principal efforts in such reforms have been focused on the integrity of access to, maintenance of and transfer of the rights to mineral resources, establishing modern and efficient granting procedures for mineral rights. From an institutional perspective, the Mineral Rights Cadastre (MRC) is a key management system for accessing mineral resources and monitoring sector performance.

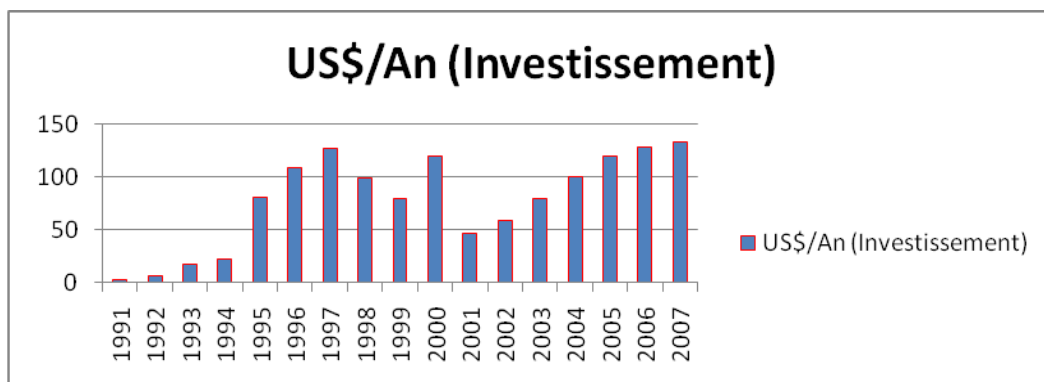


Figure 1

The establishment of a public register and the application of non-discretionary procedures as part of the MRC are critical to ensure transparency in the granting of mineral rights, to guarantee security of tenure, decrease speculative practices and

corruption, and increase the attractiveness for investments. Practical experience demonstrated that there is a very close relationship between discretion and corruption, and consequently also with insecurity of tenure and low attractiveness. After introducing the right legal and licensing reforms several countries have experienced rapid positive changes in mineral sector activity and investment, as shown, for example in Argentina (Figure 1).

The objective of the present diagnostic study is to compare the present situation in Republic of the Union of Myanmar with the international experience, and based on this comparison, to propose the solutions necessary to address the detected problems in relation to licensing and granting mineral rights, and to delineate the roadmap towards implementation of a modern computerized cadastre.



### **3. DIAGNOSIS OF CARTOGRAPHIC AND GEODETIC INFRASTRUCTURE**

#### **3.1.- THE EXISTING INFRASTRUCTURE**

In order to evaluate the available cartographic and geodetic information, the Consultant visited the Survey Department, included within the structure of MONREC.

The mapping activities in Myanmar started by the end of the XIX century, under the colonial British rules and the surveying works were undertaken by the Indian Survey Department. Later, at the end of the II World War, in 1946 the Burma Survey Department was created and started to produce the Myanmar maps.

In principle and from a general point of view, the quality and accuracy of the available cartographic and geodetic baseline information could be considered as sufficient to support the mining cadastral information. However, as it will be analysed in detail below, the heterogeneity in the use of this information introduced serious troubles and restrictions in the cadastral management. In the cartographic side, there is a full and uniform coverage of the whole country of topographic maps at the following scales:

- 1.134 sheets at 1:50.000 or 1:63.360 (depending on map edition)
- 322 sheets at 1: 100.000
- 93 sheets at 1: 200.000
- 9 sheets at 1: 1.000.000

The scale 1:50,000 can be considered (in relation to international standards) as adequate for cadastral purposes.

The first generation of these maps (1:63.360) was based on field work developed between 1895 and 1927, and revised later with the support of aerial photographs taken in 1944, being projected by Lambert Conical Orthomorphic and referred to the Indian Datum. The frame for the map sheets is based on geographic coordinates (15'x15') and the plotted grid is 1000 x 1000 yards (see Figure 2).

More recently, in the XXI century, a new generation of maps was produced by photo-restitution based Universal Transverse Mercator Projection (UTM) and referred to the Myanmar Datum 2000. On this respect, it should be mentioned that Myanmar is included into the 46 and 47 UTM projection zones. These maps maintain the same frame (15'x15') and the plotted grid is 1000 x 1000 meters (see Figure 3). In general, the characteristics of this second generation of maps are very good and consistent with the worldwide standards.

Both generations of maps have been digitized (scanned) and georeferenced by the Survey Department, and additionally the UTM maps are also available in vector format.

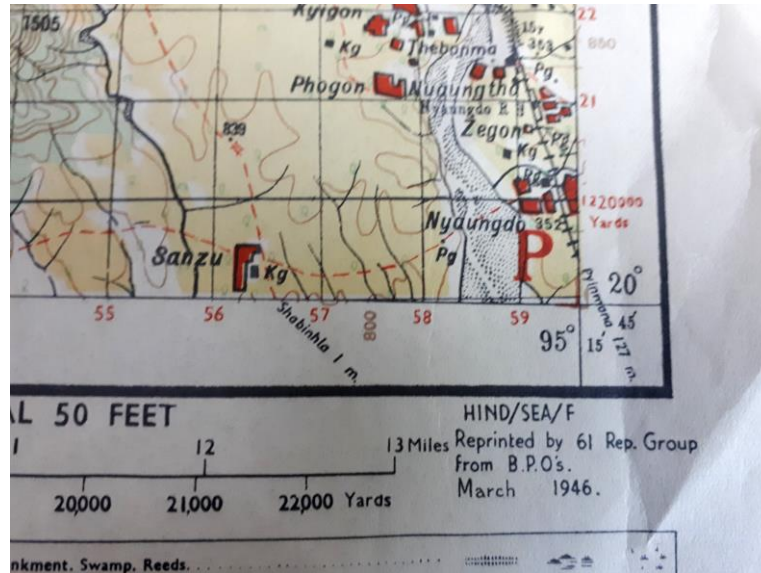


Figure 2

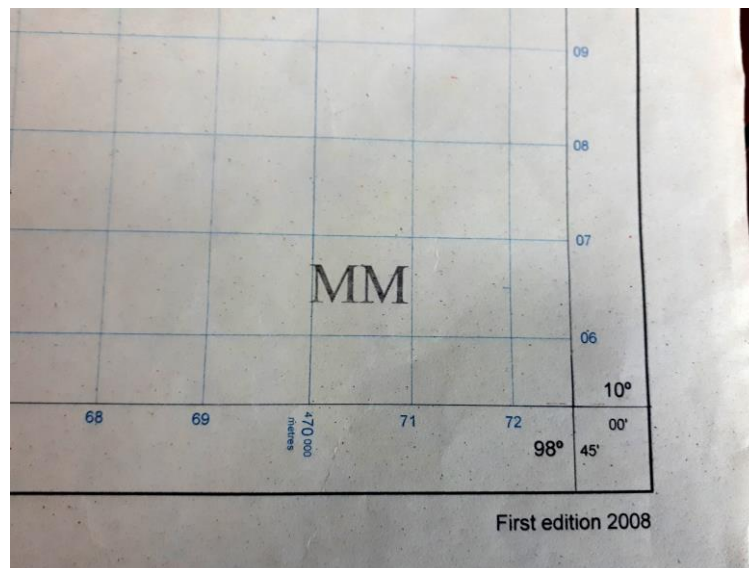


Figure 3

The geodetic triangulation network of Myanmar was originally integrated by 775 points (see Figure 4) that later was re-measured with high accuracy and double frequency GPS, being selected 9 points presently considered as primary stations (see also Figure 3). Three primary points have been linked to the international ITRF network.

Based on these measurements, a local transformation algorithm has been calculated between the UTM Myanmar 2000 coordinates and the GPS – WGS 84 references system, **and also between the Lambert maps and the GPS – WGS 84 system.** Such algorithm was initially based on 10 different parameters, but taking into consideration the detected distortion of the geodetic network and the single efficiency of each one of these parameters, finally only three parameters have been retained for the transformation. **However, these transformation algorithms never have been used or applied by Geology, Mines or Gems departments in MONREC.**

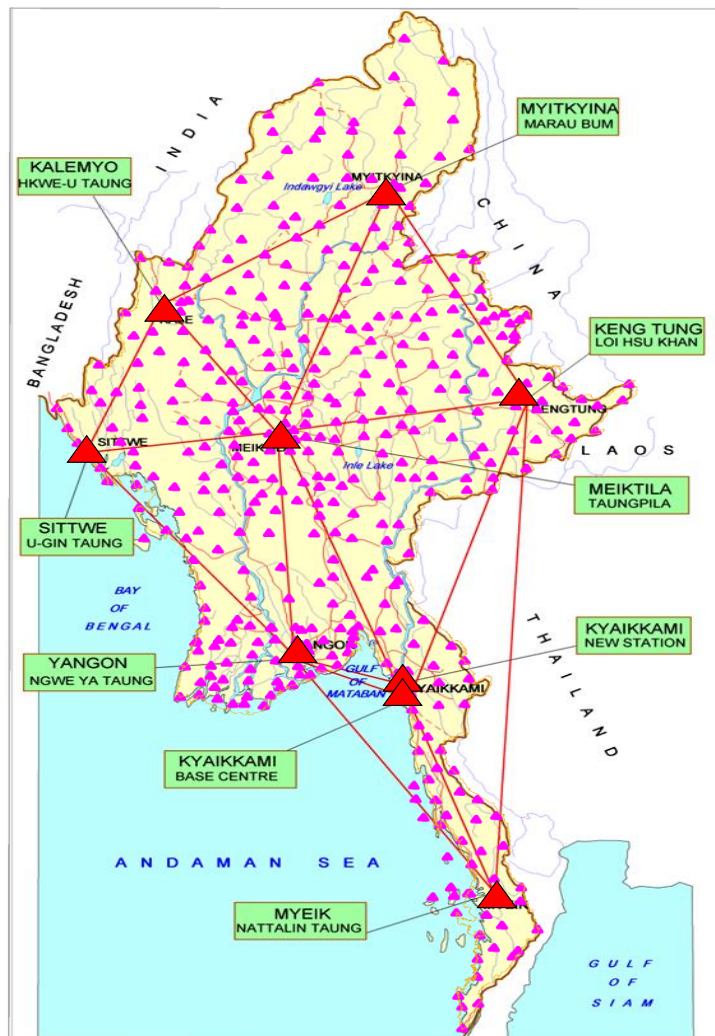


Figure 4

In addition to the works developed by the Survey Department, a multi-ministerial project (ONEMAP, engaging 11 ministries and 2 Union agencies) is developing a new generation of ortho-photo maps using aerial photography and image processing technology, and based on new ground control points related to the existing primary

geodetic network (see above), although without new high accuracy geodetic fieldwork. However, it is expected that new cartographic products will be fully compatible with GPS measurements with sub-metric accuracy. Complementarily, the project activities include also the development of database capacities, the computing and local network infrastructure required to facilitate the data exchange between ministries. The goals for this project are to exploit in the future a uniform and homogeneous cartographic infrastructure and to integrate the access to all the georeferenced information in a unified geo - portal. It should be mentioned that objectives are fully consistent and convergent with the implementation of a modern computerized cadastre. The total duration of this project is 8 years. Presently the pilot project is under development and it is expected to complete the work in 2023.

### 3.2. IMPLICATIONS OF THE CARTOGRAPHIC AND GEODETIC SITUATION FOR THE IMPLEMENTATION OF A CADASTRAL GRID AND THE CADASTRAL MANAGEMENT

Consistently to the international experience, the "best practice" solution for the optimization of land-use for mining activities, and for facilitating the management of a Mineral Rights Cadastre, is the establishment of a cadastral grid (following the coordinates plotted on the available maps) and the "Cadastral Unit" (CU). The CU consists of a quadrangular polygon with constant dimensions (or pseudo-constant, depending on the type of projection used), which is geo-referred to and which has a fixed position within a co-ordinate system and the cadastral grid.

Before the CU concept had been developed, in most countries, as is presently the case in Myanmar, there were no restrictions about the shape, geometry, and position of mining rights (see Figure 5 A), which resulted in a number of problems. The most frequent of these problems are overlaps between adjacent concessions, and the presence of areas geometrically blocked and not useful for new applications.

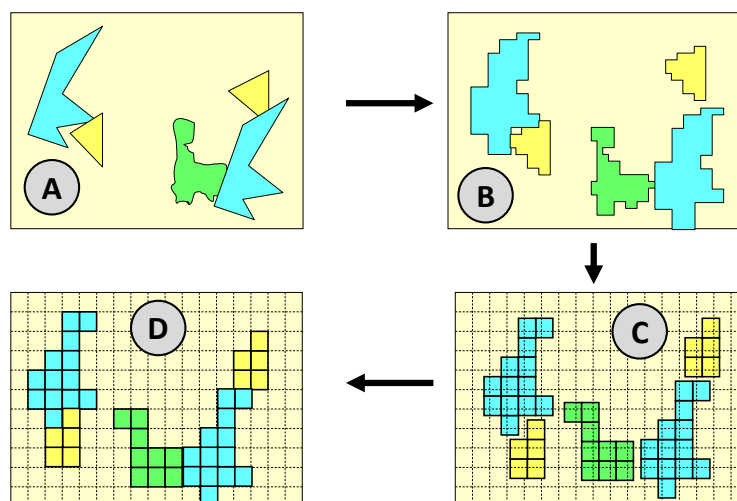


Figure 5

The evolution towards the modern CU began with restrictions on the geometry and positioning of mineral rights that starts appearing around the world as soon as the first modern topographical maps were available, at the end of the 19th and beginning of the 20th century. These restrictions required the borders of the surface areas of mineral licenses and mining rights to be polygonal, regular, and parallel to the coordinate system used in national maps (see Figure 5 B).

These conditions were soon expanded to include requirements that polygons should have minimum dimensions. The minimum size of a single mineral rights area would equal the dimensions of the CU; for instance, if a CU were 500 meters x 500 meters, then that would be the minimum area allowed for a license. Any mineral licenses should always be made up of a certain number of CUs; thus the dimensions of the sides of any polygon corresponding to a mining license and mining rights will always be in multiples of a single side of the CU (that is, 500 meters, 1,000 meters, 1,500 meters, 2,000 meters, and so on; see Figure 5 C). The final step in the evolution of a modern CU was the requirement that polygons corresponding to mining licenses and mining rights cannot float and be placed anywhere. Rather, they must always be located coherently within a predefined and standard grid (see Figure 5 D).

The concept of CU has been successively introduced in many countries during the two last decades, for instance the “cuadrícula” recently adopted in Peru and Bolivia, the “carré” used in Madagascar, R.D. Congo, Mauritania, and Algeria, the “bloco” used in Mozambique, and the CU in Ghana, Zambia and Nigeria, and is presently being introduced as for instance in Burkina Faso or Guinea Conakry. For the adoption of the CU system, two basic prerequisites are needed:

- a) Availability of suitable topographic maps, covering uniformly and homogeneously the whole country to an adequate scale; and
- b) Access to accurate GPS technology.

In relation to (a), as discussed above, Myanmar has complete coverage of maps at a suitable scale for the most of the country. In relation to (b), for fieldwork in general and for Mineral Rights Cadastre purposes it should be considered as a precondition to plot accurately the GPS field measurements on the suitable maps. Then, the applicability of the GPS technology in the positioning of the mining licenses and concessions on the maps depends on the availability of maps compatible with GPS or at least, the availability of transformation parameters, which allow for the transfer of the co-ordinates and projection system of the GPS to the co-ordinates of the maps. Without such parameters, the potential error in transferring the GPS co-ordinates directly to the maps is very high, making it unacceptable for a Mineral Rights Cadastre.

Experience from other African, American, and Asian countries where the maps are not compatibles with- WGS84 coordinates shows that the potential risk for

substantial errors derived from the use of GPS without the adequate correction parameters is high. This error is normally on the order of tens of meters (and in some cases several hundreds of meters) and thus should be considered a major difficulty for the operation of mining companies and management of the mining sector, particularly the mining cadastre. As an example, the Figure 6 shows the extremely irregular spatial variation of the differences between map coordinates and GPS coordinates detected recently in Burkina Faso.

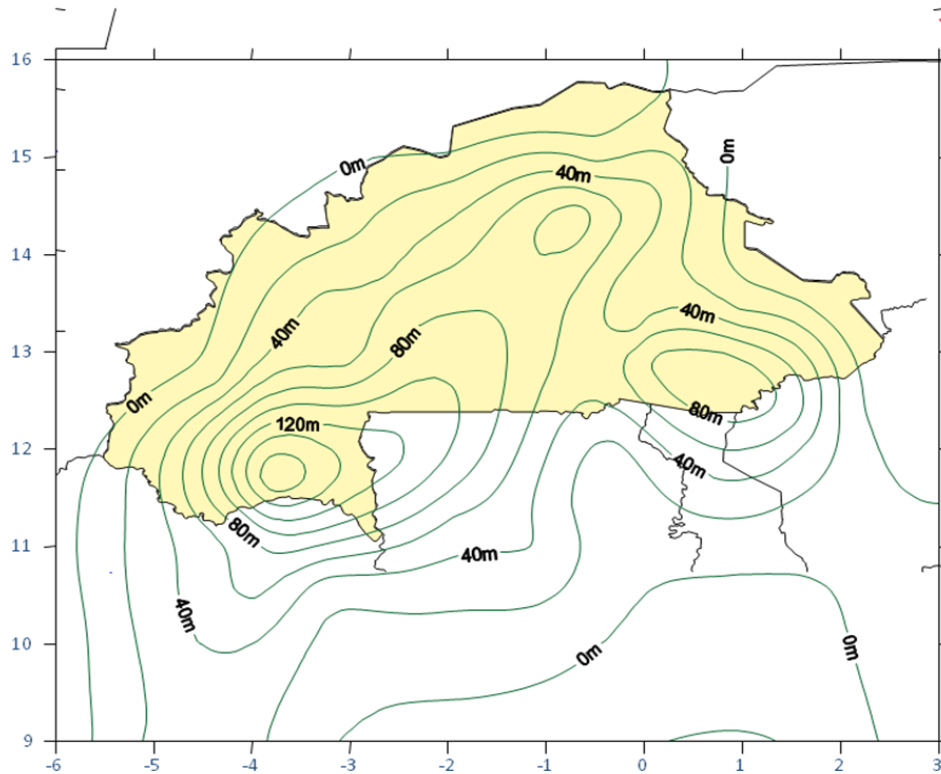


Figure 6

Accordingly to the information provided by the GPS users during the visits to the decentralized offices of MONREC in Mandalay and Mogok, the average error (differences in position or coordinate values) between maps and GPS measurements is about 300 feet. Presently, in Myanmar there is not available the graphic representation of the spatial distribution of this error, as represented in Figure 6 for Burkina Faso.

### 3.3.- THE SITUATION IN MYANMAR

In the case of Myanmar, the use of GPS for positioning the mineral rights in general and the potential implementation of the “cadastral unit” in particular have two serious constraints:

- In spite of the accuracy and adequacy of the existing topographic maps, they are not compatible with GPS and the existing algorithm for transformation based on three parameters (see chapter 3.1 above) is not enough accurate.
- The different MONREC departments participating in the licensing activities are using different types of maps, different projections and different types of coordinates, making impossible the elaboration of an integral and unified cadastral map, where all the type of licenses can be jointly plotted.

The second problem, not strictly related to the existing cartographic infrastructure, will be analysed in chapter 8, devoted to the cadastral procedures.

In relation to the first problem, the compatibility between maps and GPS measurements, it should be carefully evaluated here because it represents one of the more important restrictions for the implementation of a modern and efficient cadastre system. Practical experience from other African, American, and Asian countries shows that the potential risk for substantial errors derived from the use of GPS without the adequate correction parameters is very high and thus should be considered as a major difficulty for the operation of mining companies and management of the mining sector, particularly the mining cadastre. According to the information provided to the Consultant by the Survey Department, it has been recognized that in some areas of the country, the remaining error after transformation is over the 100 meters, totally unacceptable for cadastre purposes.

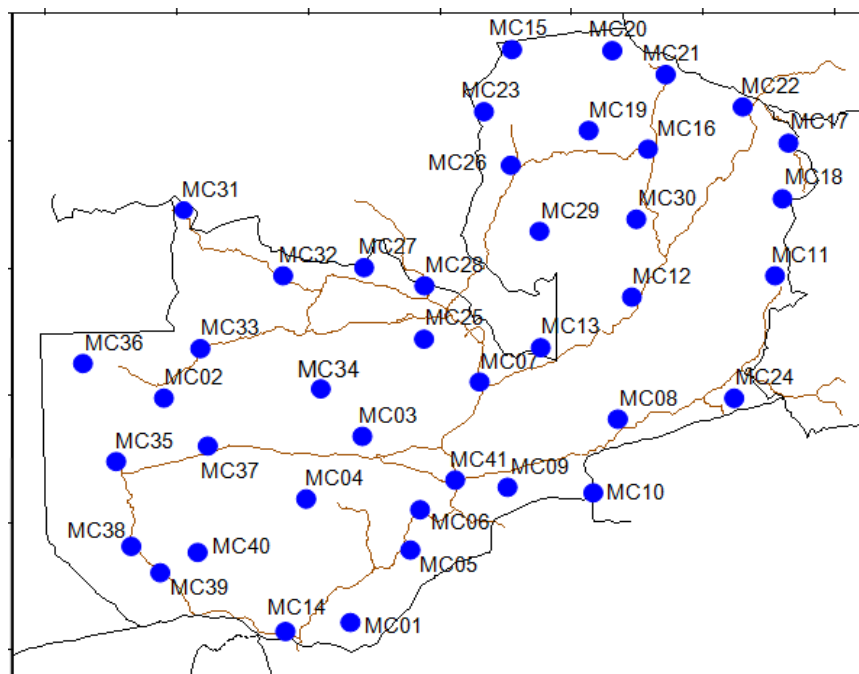


Figure 7

Furthermore, practical experience in the countries mentioned above, indicates that the special variation of these error is extremely high, as it has been already mentioned in Figure 6. Complementarily, Figure 7 shows the distribution of the geodetic points re-measured during the geodetic campaign realized in Zambia for the calculation of the transformation algorithm. The residual cartographic error detected in Zambia before the development of this geodetic campaign was more or less equivalent to errors detected today in Myanmar, i.e. over the one hundred meters. However, the Figure 8 shows the distribution of the residual errors after the application of the Polynomial Transformation Parameters calculated at the end of the geodetic campaign and where it is evident that differences between GPS and map coordinates have been dramatically reduced and in the most of the country are below one meter.

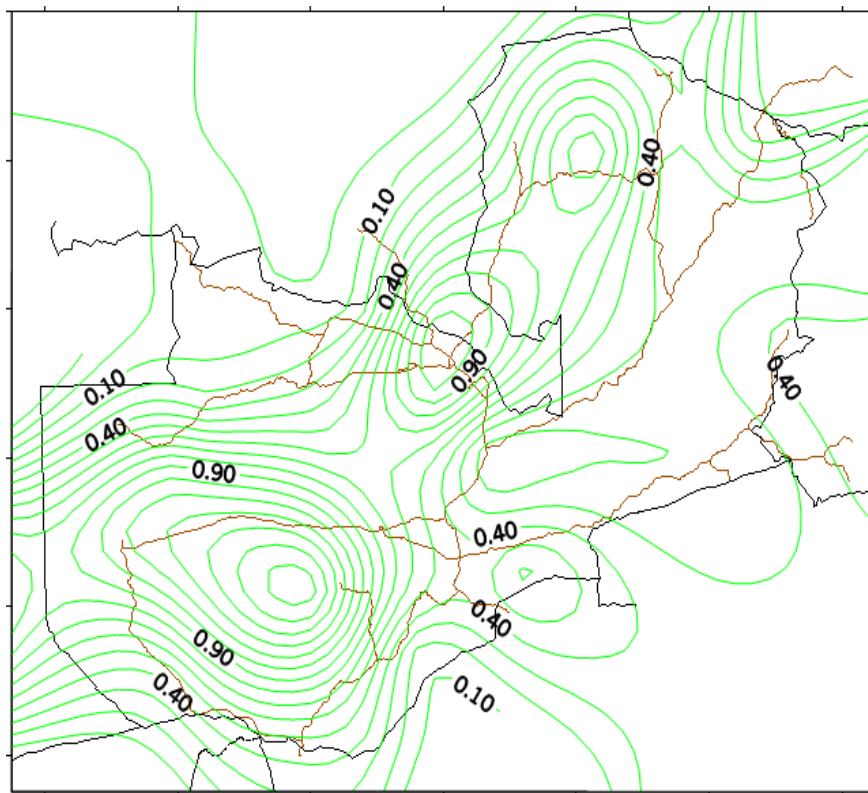


Figure 8

It must be clarified that the conceptual basis for the coordinates transformation applied in Zambia or the other mentioned countries (i.e., a geodetic campaign followed by the calculation of the corresponding transformation algorithm) are identical to the methodology applied in Myanmar (see chapter 3.1 and Figure 4), however the accuracy reached in the transformation have been not the same. Having in mind the technical information today available is difficult to infer where are the reasons to explain these differences in the accuracy of the transformation, although two main causes may be argued:



- a) The number of measured points is not sufficient (compare the number of points measured in Myanmar and Zambia, Figures 4 and 7), although also the different size of the country should be taken into consideration.
- b) The methodology applied for the calculation has been not efficient to correct the irregularities in the special error distribution. In this context, the international experience shows that the polynomial transformation used in Zambia, Mongolia, etc., is much more efficient than the 3 parameters algorithm used in Myanmar.

In any case, it can be concluded that the present situation should be corrected in the short term as unavoidable precondition for the implementation of a modern mining cadastre. Although the development of the ONEMAP project (see chapter 3.1) will improve the cartographic infrastructure and it will provide a new cartographic basis, more accurate and fully compatible with the GPS technology, it must be reminded that new maps will be not available until 2023 and consequently the implementation of a modern cadastre would require a more immediate (although transitory) solution.

#### 3.4.- PROPOSED SOLUTIONS

The solution of the existing cartographic problems linked to the licensing activities in Myanmar requires the immediate migration of the mineral rights perimeters towards a unified and modern map, where the potential overlapping can be checked without error and where it would be possible to have a complete overview of the cadastral situation of the country for all the types of licenses. This migration would imply:

- To adopt the 1:50.000 UTM as official cadastral maps.
- To improve the accuracy of the available transformation algorithms between maps (Lambert and UTM) and GPS coordinates, using the methodology based on polynomial transformation, facilitating the positioning of the mineral licenses on the field.

To acquire this capacity and based on the international experience in countries where faced the same type of problems, it is necessary to check if the available high accuracy geodetic network (see chapter 3.1 and Figure 4) is enough to calculate the algorithm with the required accuracy. On this respect, it has been already approved by the MEITI cadastre sub-committee to propose to MONREC, with cooperation of the Survey Department, the implementation of the following sequence of activities:

1. To check if the accuracy of the presently available transformation can be improved by the calculation of a new algorithm using polynomial methodology, without additional fieldwork and merely using the existing data in the same way that it has been recently realized in Mozambique, Zambia, Nigeria, Burkina Faso and Guinea Conakry.

2. If it is not sufficient, to realize field measurements of additional points belonging to the primary geodetic network.
3. Calculation of a new algorithm.
4. Transformation and migration of the existing Lambert cadastral maps towards the new UTM maps.

All these activities should be developed under close cooperation with the Survey Department as institutionally responsible for the Myanmar geodetic network. It should be highlighted that Survey Department already accepted to cooperate in the proposed planning under condition of previous authorization of MONREC's minister.

Furthermore, based on the international experience on similar campaigns developed in other countries, it is recommended the participation of an international expert in geodesy to revise the calculations and ensure the accuracy of the obtained algorithm.

Finally, it shall be taking into consideration that the availability of accurate transformation algorithm will represent an immediate improvement not only for licensing purposes and the improvement of the mining sector management, but also for any GPS user in the country (forest, environment, agriculture, civil works, geological mapping, etc.).

Finally, it should be also mentioned that the proposed solution would be totally convergent and compatible with the objectives of the ONEMAP project.

#### **4. THE INSTITUTIONAL ORGANIZATION**

Although the mission's objectives are focused on the licensing system, the Consultant reviewed the institutional organization of the Republic of the Union of Myanmar participating in the management of the mining sector to acquire a complete picture and facilitate the analysis of licensing activities.

One of the basic principles applied in the reform of the mining sector in countries that have succeeded in attracting investment in the two last decades has been to have a clear institutional separation between the administrative responsibilities for granting mineral licenses, the control of mining activity, and the generation of geological infrastructure. Each of these activities are complementary functions for the management of the mining sector, but practical experience shows that the system is more efficient and the risk lower for the investor if they are organizationally isolated, having separate administrative units respectively and exclusively responsible for:

- Granting mineral titles (Mineral Rights Cadastre);
- Controlling the mining and exploration activity (Mining Inspectorate); and
- Preparing the geological and metallogenic knowledge at regional scale (Geological Survey).

##### **4.1.- DESCRIPTION OF THE INSTITUTIONAL UNITS PARTICIPATING IN LICENSING**

In the present institutional organization of the Republic of the Union of Myanmar government, the ministry in charge of managing mineral resources is the Ministry of Natural Resources and Environmental Conservation (MONREC). Before March 2016 this role was undertaken by the Ministry of Mines, but now is fully integrated in MONREC, where the organization is shown in Figure 9 and the functions and responsibilities of the units participating in licensing activities is described below.

##### **4.1.1.- Geological Survey and Mineral Exploration Department (DGSE)**

The DGSE is the organizational unit responsible for the initial steps for licensing of prospection and large scale exploration licenses, although the main responsibilities for licensing are under the Direction of Mines (DOM). After granting, the DGSE is responsible for monitoring the activities only for "large scale exploration"<sup>2</sup> licenses.

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<sup>2</sup> This concept will require further research for clarification before the preparation of the final report, because this "type" of license is not provided in the legal texts.

The structure of the Department is made-up by a head office and 3 regional offices, although the licensing activity is exclusively developed in the head central office in Nay Pyi Taw.

The head office is integrated by the following Divisions:

- Geo – Planning Division
- Laboratory (Chemical and Petrology) Division

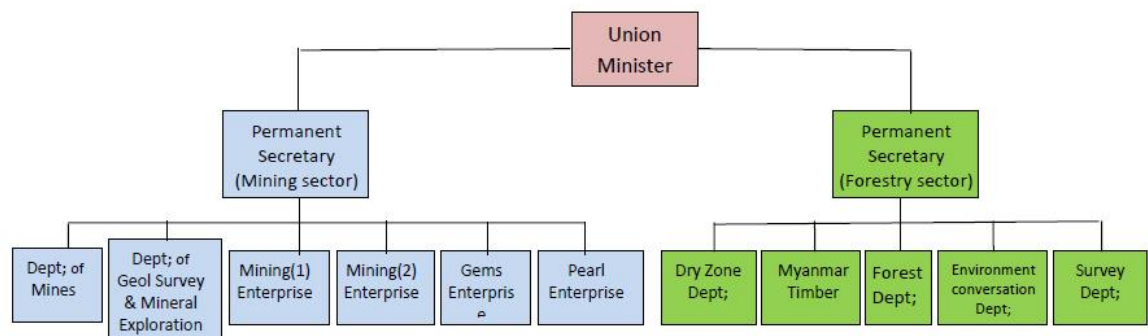


Figure 9

The responsibilities for licensing of prospection and exploration licenses are delegated in the Geo – Planning Division, having the following internal organization:

- Joint Venture (foreign and nationals) Section.
- Photo-geology, Remote Sensing and GIS Section
- Geophysics Section.
- Geochemistry Section.
- Topographic Survey Section.
- Geological Mapping and Exploration.

And subsequently, within this organization, the responsibilities for licensing are delegated in the Joint Venture Section.

#### 4.1.2.- Department of Mines (DOM)

The DOM is the organizational unit mainly responsible for the licensing activities (excepting gemstones), although the evaluation of the applications, depending of the type of licenses, is shared with the DGSE, Minerals I and Minerals II Departments. After granting, DOM undertakes the responsibility for monitoring and inspection of

mining activities at any scale (excepting gems) as well as supervision of “small scale exploration” licenses<sup>3</sup>.

The structure of the Department is made-up by a head office and 8 regional offices, although the licensing activity is exclusively developed in the head central office in Nay Pyi Taw, being the decentralized offices focused on inspection and conservation activities. The head office is integrated by the following Divisions:

- Inspection Division.
- Conservation (Mineral and Environment) Division.
- Salt Division.
- Planning and Management Division.
- Development Division

The responsibilities for licensing are delegated in the Development Division, which is also charged on royalty collection.

#### **4.1.3.- Myanmar Gems Enterprise (MGE)**

The MGE is the organizational unit responsible for the licensing of gemstone licenses. The structure of the department is made-up by four General Directions, 2 in the head office and two decentralized offices (managing 9 regional offices), focused on exploration activities. The licensing activities are exclusively developed in the head central office in Nay Pyi Taw. The head office is integrated by the following structure:

- General Direction 1:
  - Gems Division
  - Jade Division
- General Direction 2:
  - Management and Planning Division
  - Budget Division
  - Emporium Division (regions)
  - Emporium Division (Nay Pyi Taw)
  - Licensing Division

The responsibilities for licensing are logically delegated in the Licensing Division.

MGE has also regional / states or sub-regional decentralized offices, depending on the geographical location of the activities related to the gems exploitations.

<sup>3</sup> In the same way that above, this concept will require further research for clarification before the preparation of the final report, because this “type” of license is not provided in the legal texts.

#### 4.1.4.- Mining 1 and Mining 2 Enterprises

These two departments (or enterprises) are respectively devoted to Industrial Minerals (Mining I) or gold and metallic ores (Mining II). Their main function is the management of the “Production Shared Contracts”, signed with the titleholders during the licensing procedures for any exploitation title (see also chapters 6.3 and 8.2 on this respect), where the State participation is fixed for the small scale licenses (70 % for the holder and 30% for the State), and in opposite it is variable (negotiated and depending on the final economic balance), for the large scale licenses. The State participation do not implies capital contribution.

The management activities is being developed by joint management committees which, in spite of the participation mentioned above, is integrated by 2 representatives of the titleholders and 3 representatives from the administration. The frequency of the meetings is each 6 months for the large scale licences and each 4 months for small scale titles.

In addition and contradictorily, Mining I and Mining II enterprises are also responsible for the evaluation of applications for “small scale exploration licenses. They have not regional delegations

#### 4.2.- EVALUATION OF THE PRESENT INSTITUTIONAL ORGANIZATION

Practical experience gathered from several countries over the past three decades has shown that the effectiveness of a Minerals Rights Cadastre depends less on following some pre-defined organizational model and more on respecting the institutional separation mentioned above. The Figure 10 shows the example of the Mauritania organization, where they unified in a single directorate the solid minerals and the oil & gas cadastre, although maintaining separated licensing procedures corresponding to the respective legal texts.

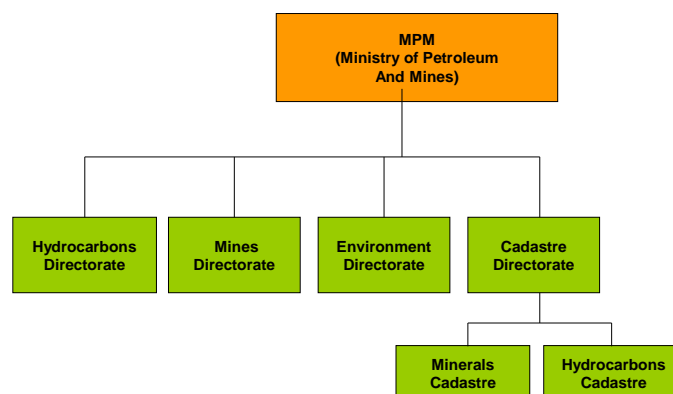


Figure 10

The Figure 11 shows the institutional organization of Mozambique, where the cadastre is under the Direction of mines inside the ministry structure

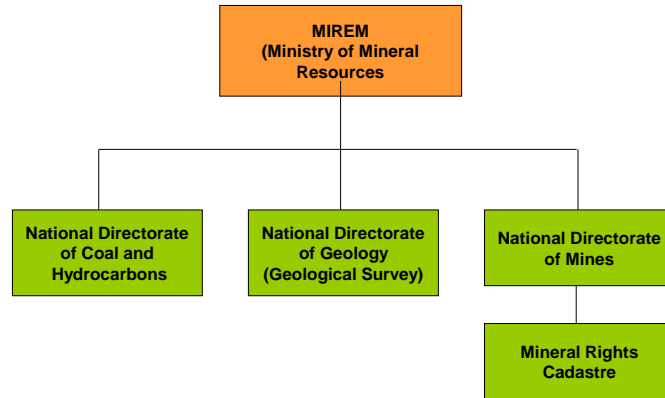


Figure 11

In the case of Madagascar (see Figure 12), the cadastre is outside the ministry organigram, working with operational and economic autonomy and avoiding interferences with the directorate of geology and mines. This model has been recently applied in many countries as R.D Congo, Peru, Algiers, Guinea Conakry, etc. In some extreme cases, as for instance in Chile or some Argentina's states, the cadastre is linked to the Ministry of Justice, in order to get the maximum of institutional separation of licensing responsibilities by respect to the control and monitoring.

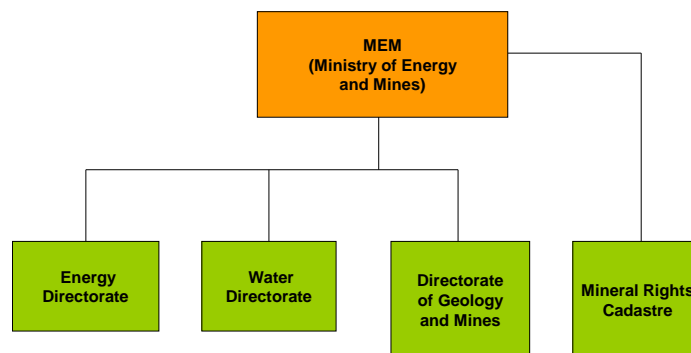


Figure 12

Whatever type of organizational model is adopted, it is important to ensure that it is clear and effectively structured, as organizational structure helps to restrict (or at least to minimize) undesirable manoeuvres and corruption. Independently of the selected organization, the administrative unit responsible for licensing should be completely independent from any state entity authorized to hold, explore, develop, operate, or dispose of mining properties. This independence is required to avoid conflicts of interest and guarantee objectivity, transparency, equity, and fairness in decisions affecting the granting of mineral rights. The present Republic of the Union of Myanmar institutional organization includes significant differences by respect the best international practice, affecting seriously the security of tenure and consequently, the attractiveness for the investments, as for instance:

- There is not a real mineral rights cadastre, i.e. an organizational unit ***exclusively*** devoted to the licensing activities, because in fact the cadastral duties are split between several units belonging to **five** different departments, as described in chapter 4.1. This situation produces negative effects and causes functional difficulties, as it will be discussed in chapter 7, where a detailed description and analysis of the licensing procedures has been included. In addition, it exists also a "mixture" between cadastral and not cadastral duties, affecting the transparency, the objectivity and the efficiency of the cadastre management.
- If we consider the in the present licensing procedures there are no guarantees for respecting the principle "first come, first served" because there is potential risk for overlapping (see chapters 5 and 7) and taking also into the account also that the government has the right to an equity participation in the exploitation of a deposit, the presence of potential conflict of interest are obvious because it may lead to arbitrary decisions favouring the State interest.
- The organization (in respect the licensing activities) is excessively fragmented, with participation of too much units doing iterative work, generating artificially complex and long procedures, with many unnecessary steps which sometimes are duplicated or even triplicate between different units.

It can be concluded that present organization in Republic of the Union of Myanmar breaks the principle that the "cadastre" must be entirely and exclusively responsible for the entire chain of licensing activities, and not participating into control or monitoring responsibilities. In practice this could represent an additional risk for applicants and titleholders, that would be removed by the implementation of an efficient and independent cadastre unit, operating without discretion and strictly based on the principle "first come, first served".

Additionally, it should be also highlighted the institutional interferences between licensing, monitoring activities and geological infrastructure, because the DGSE,



DOM and GED, as well as Minerals I and Minerals II enterprises are participating simultaneously responsible for licensing, geological infrastructure, production monitoring and management of geo-data.

#### 4.3.- EVALUATION OF THE DECENTRALIZED INSTITUTIONS

Consistently to the administrative division of Myanmar, the MONREC departments (DOM, DGSE and GED) have decentralized offices in 7 States and 7 regions, including some sub – regions. The distribution and size of these decentralized offices is not uniform and it depends on the level of specific activity linked to each one of the departments mentioned above.

Taking into consideration the available time framework in this project, logically, it has been not possible to know personally a substantial part of these decentralized units, but at least it has been possible to visit two offices that could be considered as representatives of their capacities and functions, as described below.

##### 4.3.1.- *The DOM Regional Office in Mandalay*

The activities developed in this office are restricted to the inspection and monitoring activities, excluding gemstones and large scale exploration licenses (presently 444 licenses are being controlled in the Mandalay region). However, this office is not participating in the decentralized steps of the licensing procedures, because when the application dossier is sent to the region / states for evaluation (see chapter 8), it is addressed from MONREC headquarters in Nay Pyi Taw directly to the Mandalay Regional Government, to the Prime Minister Office.

After reception of the application dossier, the Regional Government is autonomous to decide about granting without participation of the Union government or the consultation to DOM regional, which is only informed by headquarters at the end of the procedure, when the it is achieved and the licenses has been already granted (if it is the case, because refusals are not communicated). In opposite, the DOM decentralized offices have some active participation in the extension (renewals) procedures, because their inspection reports are required before taking the granting or refusal decision.

It should be also mentioned that the DOM decentralized office is not totally autonomous for the inspection activities, which are being supervised by a committee jointly integrated by the Union and Region administration, but where in practical terms, normally the Union representatives (belonging to the MONREC headquarters in Nay Pyi Taw) are not participating.

In case of conflict for positioning between adjacent or neighbour licenses, the required technical responsibility is undertaken by agents from DOM headquarters, although this type of troubles appears very rarely.

#### **4.3.2.- *The MGE Regional Office in Mogok***

The activities developed in this office are restricted to the inspection and monitoring activities for gemstone licenses (presently about 1000 licenses are being controlled in the Mogok sub - region). This office is not participating in the licensing procedures, which are totally developed in the GED headquarters in Nay Pyi Taw. However, this office has some active participation in the extension (renewals) procedures, because their inspection reports are required before taking the granting or refusal decision.

In case of conflict for positioning between adjacent or neighbour licenses, the required technical responsibility is undertaken by agents this office and normally the geologist or mining engineers plays as surveyors. It must be said that in spite of the high density of licenses and the limitations in equipment, the positioning conflicts are rare due to the presence of field beacons used as bench marks.

#### **4.4.- CONCLUSIONS AND PROPOSED SOLUTIONS**

The present institutional organization of MONREC, as ministry responsible for the management of the mining sector and in relation to licensing mineral rights, does not fulfil the international standards of separation between monitoring the activities and granting the mineral rights. In practical terms, there is a substantial mixture of responsibilities because all the departments under the Mining Sector Permanent Secretary (see Figure 9) are in one or other way participating in licensing activities.

As consequence, there are potential conflicts of interest and it is not possible to guarantee the objectivity, the transparency, the equity and the fairness in decisions affecting the granting of mineral rights. This comment is applicable to the entire mining sector, but it is specially indicated to the gemstones, where the MGE commercial interests and responsibilities are intermixed with licensing and regulatory responsibilities.

The only solution to correct these problems is to modify the present organization of MONREC under the following principles:

- a) To create a new unit named “Mineral Rights Cadastre” with exclusive responsibilities for licensing, including the reception and registration of applications, the verification of eligibility, checking the overlapping, evaluating for granting or submission to granting authority and maintenance of the mineral rights (renewal, transfer, extension, expiration, etc.).
- b) To take out the licensing activities from their present institutional position in DGSE, DOM and MGE, being transferred to the new “Mineral Rights Cadastre”.
- c) The unified integration of licensing procedures within the “Mineral Rights Cadastre” does not must imply a single procedure for the licensing of each

mineral right, that must preserve the differences established in the present laws for standard mineral in laws.

- d) In addition, it must be established different procedures for exploration and mining rights, consistently to the suggestions expressed in chapters 5 and 7.
- e) The statements c) and d) above, must no avoid the availability of integrated cadastral information in a unified cadastral database, SIG and cadastral maps.

## 5. TECHNICAL AND HUMAN CAPACITIES

### 5.1 EVALUATION OF THE INSTALLED CAPACITY IN CENTRAL UNION ADMINISTRATION

From a general point of view and taking into consideration only the licensing activities, it must be said that operational capacity has significant limitations in equipment and infrastructure. Although the installations are clean and properly maintained, and they seem sufficient to host all the required installations and capacities, they are placed in different buildings, where sometimes the space available in the offices is too small for the number of agents and professionals (see Figures 13 and 14).

In addition to that, the availability of computer tools is very limited, insufficient for the agents and professionals engaged in the management of the mining sector (especially for licensing), who are obliged to develop the majority of the task without the computers support using manual methodologies. The main restrictions in the existing computer capacities are the following:

- The most of the cadastre and agents have not access to computer tools.
- The existing computers (at least for licensing activities) are working as standalone terminals, not always linked by intranet, avoiding the continuous updating of the information and sharing databases. In some cases, data exchange must be done via pen-drive, with the consequent potential errors and mistakes.
- The software installed in the computers (at least for licensing activities) has not official licenses.
- Databases software installed in different departments participating in licenses are not homogeneous, coming from different brands, and different formats (the fields of information are different), making extremely difficult the data exchange (see also chapter 9.1).
- The software is not being properly used due to the lack of training and formation (users are self-learners). For instance, in the GIS software, the entry of the alphanumeric information is done through the attributes table, instead to be imported from linked databases.

As consequence, it can be said that the computer resources are scarce, insufficient and furthermore, they are underexploited. The combination between the deficiencies in computers and the separation between offices makes difficult the coordination and harmonization of licensing procedures running separately in parallel for different types of licenses (see also chapter 9.1, Table V and Figures 28 and 29).

In opposite, and closely related to the scarcity of computers, the number of human resources seems more than sufficient (at least in comparison with the international standards and taking into consideration the present level of activity in the mining sector), probably because procedures and working methodologies are complex and obsolescent, being based nearly exclusively on paper – analogic work (see also chapter 8 on this respect).



Figure 13

For instance, 405 employees are working in DGSE, 120 of them are geologists assigned to the Geo – Planning Division, where 9 are devoted to licensing activities, in addition to one lawyer and one translator. If we consider the size of the cadastre for “large scale exploration” activities (24 licenses in total, see also chapter 9), it seems that there is not a rational proportion between the number of licenses and the required team for their management. Something similar can be said for the Development Division in the DOM in relation to the licensing for small scale and exploitation licenses (9 people devoted to licensing), in the Mining I Enterprises Department with more than 150 employees or in the MGE (having in total more than 600 employees). The Figures 13 and 14, corresponding respectively to the Minerals I Enterprise and the Development Division in the DOM, are illustrative for the

saturation in the number of employees, the working atmosphere and available equipment.



Figure 14

However, independently of the situation highlighted above, the agents responsible for licensing activities in the different departments are well committed and motivated with their licensing obligations, and they have also a good knowledge of the procedures to be applied. However, due to the particular situation of the legal and regulatory framework, where the Mining Law has been recently amended and the regulations have been not yet updated (see chapter 6), these procedures are slow, heavy, unnecessary complexes and plenty of iterative bureaucratic steps (see also chapter 8).

In addition of the difficulties detailed above and in spite of the undeniable motivation and professional qualifications of the agents responsible for licensing, it should be highlighted that they are not familiar with the conceptual basis for a modern cadastre and the best international practices in licensing, because they has been trained exclusively under the licensing principles and practice applied in Myanmar during the last decades.

## 5.2.- EVALUATION OF THE INSTALLED CAPACITY IN DECENTRALIZED UNION ADMINISTRATION

As described in chapter 4.3, the distribution and size of the decentralized offices is not uniform and it depends on the level of specific activity linked in each area. Based on the observations realized during the second mission, the Consultant can only describe the installed capacity evaluated in two MONREC decentralized offices: the DOM office in Mandalay and the GED office in Mogok sub - Region. Both offices are quite different in terms of size and human capacities, being probably representatives on the real differences existing between regions, states and offices. On this respect, it should be mentioned that in some cases (at least in 3 states) there is not DOM decentralized office due to the shortening of staff.

The DOM Regional Office in Mandalay is integrated by 9 staff, where 3 are high level (1 geologist, 1 geographer 1 mining engineer), 3 technical staff and 3 normal workers. The office is equipped with 2 cars (although they are not 4x4 and cannot be used for field work and inspections), 1 GPS hand-navigator, 1 computer, 2 printers and 1photo-copy machine. The office has not internet access. The position of the licenses is only plotted on photocopies of topographic maps (see Figure 15), and there is not maps covering the Region and cadastral and showing the complete cadastral distribution of the licenses. Additionally, the Figure 16 shows the aspect of the office.

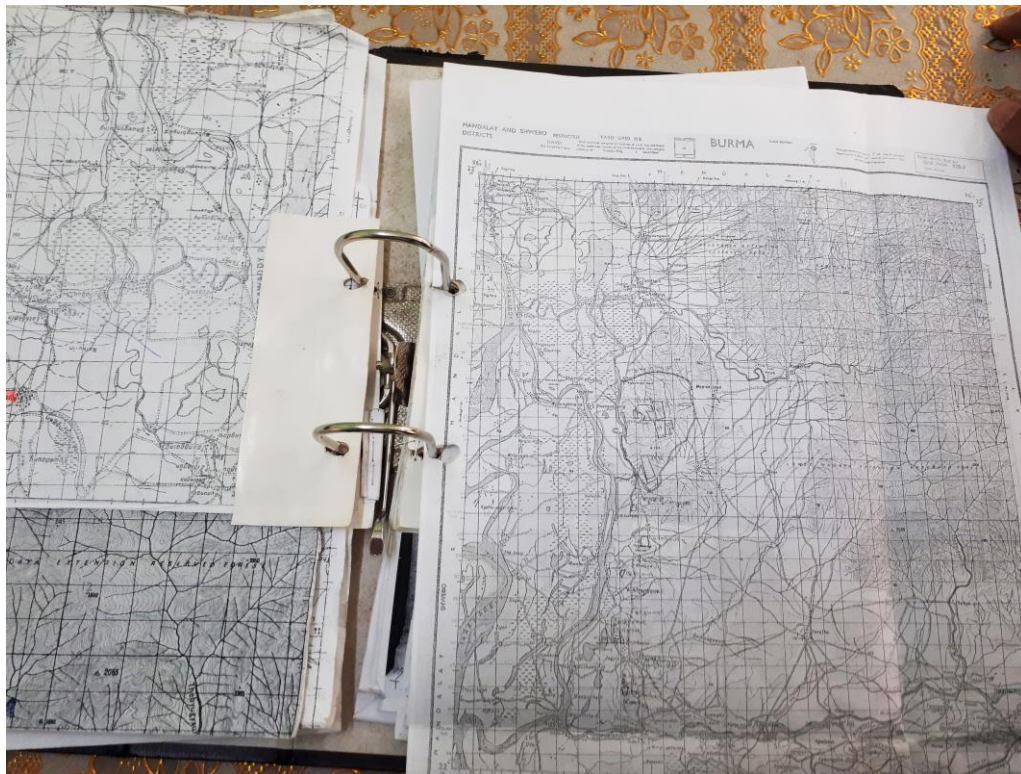


Figure 15



Figure 16

The MGE Regional Office in Mogok is integrated by 58 staff, where 16 are high level (12 geologists and 4 mining engineers). The office is equipped with 1 car (although it is not 4x4 and cannot be used for field work and inspections), 1 motorbike, 3 GPS hand-navigator, 10 computers (7 laptops and 3 desktops), 2 printers and 1 photocopy machine. The office has not internet access.

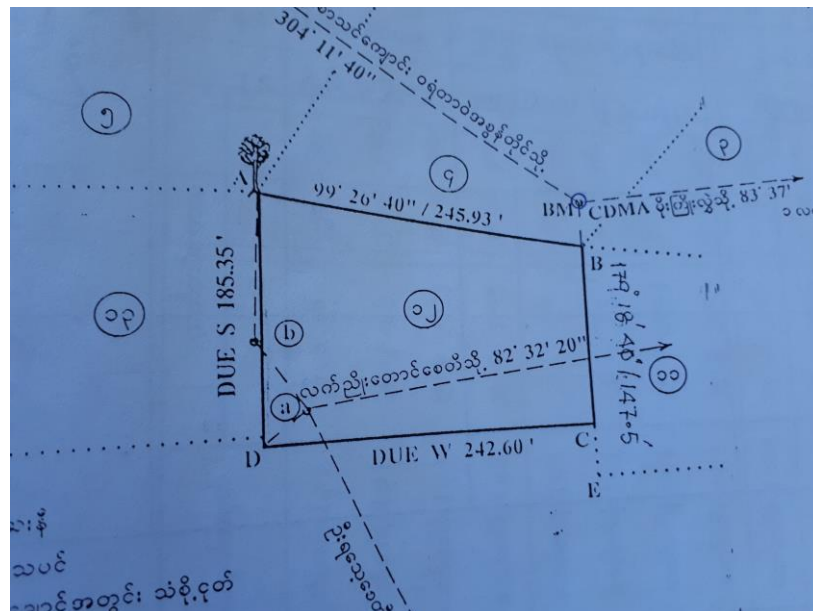


Figure 17



The positioning of the licenses is not realized by coordinates or maps, and the methodology being applied is based on bearing degrees, fixed beacons or benchmarks strategically positioned on the terrain (see Figure 17). Normally, the GPS are not used for demarcation of the licenses because the error is too big. In spite of the old methodology used for positioning, the number of conflicts and overlaps because the area being mined are the same since decades ago and the boundaries of the licenses are well known and beacons. However, outside the tracks, if some application for new areas arrives, there is high risk of overlapping with other licences or pending applications. Additionally, the Figure 18 shows the aspect of the office.



Figure 18

In spite of the differences between in size of both offices, they have identical limitations in operational capacity, because they are not equipped with the unavoidable tools required to control the health and safety conditions in exploitations, especially in the underground mines, as they are the devices for controlling dust and air quality. Also, they have not vehicles adequate to access the mining sites and inspections are executed normally using the cars belonging to the titleholders, who are noticed in advance about the inspection visit.

It's obvious that under the present conditions, it is totally impossible the accomplishment of all the inspection duties that would be required for guaranteeing the fulfilling of the mandatory obligations by the miners, generating tremendous limitations in the inspection capacity. Applicants and titleholders are perfectly aware about the lack of capacity of the Administration for control on the ground, and they know that will be not punished for irregularities or if they hide

the real productions to avoid the royalties payments. International experience demonstrates that lack of adequate field control and inspection produces systematic violations of the legal prescriptions as well as a marked tendency to decrease the value of the declared mineral production (and logically, the royalties to be paid), resulting in important losses to State income and in relation to the licensing system, a decrease in the credibility and the security of tenure.

### 5.3.- CONCLUSIONS AND PROPOSED SOLUTIONS

The problems and difficulties mentioned in chapters 5.1 and 5.2 above imply that the present cadastral management of mineral rights in the Republic of the Union of Myanmar is far away from the international standards. In fact, many of the detected problems are closely related to the inadequate institutional organization, the ambiguous regulatory framework, the complexity of the procedures and the lack of the adequate equipment. This situation affects seriously the operational capacity of the existing resources and the quality of the management. The licensing methodology needs a deep revision in practical aspects related to the codification and filing (see also chapter 8 and Figure 34 on this respect). The Figures 13 and 14, in addition to show the lack of space for agents and professionals, show also the absence of adequate furniture and boards to store and to file properly the documents.

Based on the previous statements, it is evident that equipment and human skills are in need of upgrading in regard to the licensing matters. The efforts to improve capabilities must be focused on:

- Adequate use of the computer tools, mainly for database and GIS exploitation.
- Understanding of institutional cadastral concepts and modern cadastral management rules.

In the opinion of the Consultant, the required training must be developed on two different levels:

- On the job training, specifically applied to the Myanmar licensing procedures.
- Study tours to countries that have succeeded in reforming the mining sector over the past two decades and where the positive impacts derived from these reforms—where the Mineral Rights Cadastre played an essential role—have been appreciated by mining investors and led to strong sector growth. These countries must be selected based on features and scales where the experience could be transferable to Republic of the Union of Myanmar.

Based on the observations realized during the second mission, it can be stated that under the present conditions, it is y impossible the accomplishment of all the

inspection duties that would be required for guaranteeing the fulfilling of the mandatory obligations by the miners because the inspection capacity is very limited. International experience demonstrates that lack of adequate field control and inspection produces systematic violations of the legal prescriptions as well as a marked tendency to decrease the value of the declared mineral production (and logically, the royalties to be paid), resulting in important losses to State income and a decrease in the credibility and the security of tenure. Such limitation has also incidence in the licensing procedures, not in the case of application for new titles but for extensions or renewals, where it is necessary to demonstrate the fulfilment of the obligations prescribed in law.

Finally, it must be also highlighted that the visits realized to the MONREC offices in Mandalay and Mogok does not allowed to learn about the decentralized steps in the licensing procedures, because such activities are exclusively executed in the region / states administrations. In order to complete properly the diagnostic, this evaluation must be unavoidably developed during the third mission, especially after the recent approval of the regulations, where it the partial decentralization of some licensing responsibilities.

## **6. EVALUATION OF THE LEGAL FRAMEWORK**

The analysis of the existing legislation is strictly required in order to know the basis for current licensing conditions and to suggest the required solutions to the issues detected in the present diagnostic. From the conceptual point of view, the evaluation of the legal texts represents a substantial part of the cadastral system evaluation, not merely for procedural aspects, but also for any legal prescription affecting the mineral rights, the security of tenure and the attractiveness for investments. Under this scope, the legal texts (laws and regulations) have been examined, highlighting the essential aspects that may affect the cadastre functionality and the licensing activities to avoid potential negative impacts.

The present situation of the legal framework related to the mining sector in Myanmar is very peculiar because the legislation corresponding to the solid mineral is split in two different laws, one for Gemstone mining and one for any other minerals. Both laws have been recently modified and approved, and in addition the so-called Rules (regulations) that provide implementing details of the mentioned laws, have been also very recently approved, although the English translation is not yet available and consequently it has been not yet evaluated. These laws and the problems derived from the lack of regulations will be analysed separately below.

### **6.1 THE LAW AMENDING THE MYANMAR MINES LAW NO. 72/2015**

From a general point of view, it should be highlighted that this law is conceptually very different by respect to the international standards and the best international practice, and several essential items are missing or are poorly defined in the text, generating significant ambiguities and implying substantial risks which affect the attractiveness of the country for investments. The more important of the detected gaps or ambiguities are detailed below:

1. There is not a clear separation between the soil property and the mineral rights. The most of the mineral laws in the world considers the mineral rights as real estate properties, able to be mortgaged, transferred and inherited, as well as independent from the soil property. As it will be analysed later in chapter 8, this lack of separation has an important incidence in licensing procedures, where the same methodology is being applied for exploration and mining titles, acting as a discouraging and blocking factor for the exploration activities.
2. The law is silent about the criteria to be considered for granting. The most of the mineral laws in the world follows the principle “firs come, first served” as basic criteria, introducing some exceptions, where under specific circumstances, the licenses can be also granted by auctioning or tender bids. On this respect, although in Republic of the Union of Myanmar there are special reserved areas for minerals, there are no subsequent provisions detailing how to grant areas derived from potential discoveries in such

territories, that normally and following the international experience, should be granted by auctioning or tender bids. The legal texts should provide details about when and how to initiate auctioning, how to organize auctions and the requirements which should be published in advance in order to guarantee the transparency (see chapter 6.5).

3. One of the basic principles to be applied in the organization of the mineral rights management, which was first discussed in Chapter 4, is the need for clear institutional separation between the administrative responsibilities for granting mineral licenses, the control of mining activity, and the generation of geological data. In order to achieve such separation, the definition of institutional functions, responsibilities and duties of the corresponding entities (cadastre, geological survey and engineering or inspectorate department), should be included in the law.
4. There is not explicit declaration about transparency in cadastre. The legal texts must prescribe that cadastre information should be open to the public consultation.
5. There is not conceptual separation between the mineral rights linked to the property (prospection, exploration or mining) with the activities derived from the mineral treatment and dealing (export or commercialization licenses).
6. There are not prescriptions about the maximum size and duration of the permits.
7. The legal texts is in some cases too ambiguous and the lack of precision and details about some aspects in the management of mineral rights, leaves essential aspects open to interpretation, and consequently to potential subjectivity and discretion. This ambiguity implies, in practical terms, substantial risks for the security of tenure, starting with the conditions required for the granting and renewal of the licenses, where applications must be evaluated under subjective (and potentially discretionary) conditions because the criteria and parameters for the evaluation are not specified in the Law.

On this respect it should be highlighted that one of the essential pillars of best practice for licensing is the elimination of discretion to the maximum extent possible. Granting criteria must be equally applied to any type of applicant without distinction between nationals and foreigners, or investor size. Because of this principle, all granted licenses must have the same standard characteristics, fixed by the same rules, without negotiations.

The comments above are especially relevant in relation to the lack of definition for criteria to be used for the evaluation and granting of applications. In fact, there are not established parameters to support the

objectivity of this evaluation, which consequently would be potentially discretionary and subjective. All these prescriptions affect seriously the security of tenure and the attractiveness for investments. For instance, section 29 prescribes that “ *The Ministry may with the approval of the Government issue prohibitions in respect of purchasing obtaining, storing, possessing, transporting, selling, transferring of any mineral obtained from mineral production*”, that implicitly implies the risks for losing the permit by ambiguous and discretionary decisions.

Something similar can be said about the content of article 28, where it is prescribed that a permit can be cancelled, even confiscating the security deposit, if the holder or a person managing on his behalf **or any of the worker fails to comply with any of the orders or directives made under this Law**. This prescription must be considered as extremely risky for titleholders, especially if we take into consideration that MONREC participates directly as shareholder in some of the exploitation permits through the administrative departments Mining I and Mining II and has six State Economic Enterprises (SEEs). On this respect, it must be taken into consideration the article 35 (a) where it is prescribed that “*Regarding the mineral production, the Ministry may form joint venture or partnership with the permit holder and in doing so, it shall be based on pro rata basis or profit share basis on production including costs of environmental impact assessment, or profit share basis on equity contribution*”. Although the situation today is evolving from being owner / operators to regulator / administrators, it seems that such transition is far from complete.

8. A specific aspect, directly related to the previous point, which potentially may negatively affect the security of tenure (and linked also to the discretion), concerns the transition from exploration rights to mining rights. As it is well known, it is very difficult to invest in mineral exploration if the risk of losing the rights over the discovered resources exists, consequently losing the possibility of recovering the invested capital. For this reason, one of the fundamental and priority requirements of investors is to have guaranties in regard the right to exploit minerals discovered during the prospecting phase. This security is normally given by a combination of two principles:
  - The exclusive rights of the titleholder to any mineral discovered inside the license; and
  - The automatic right to convert the exploration right into a mining right.

The first condition is not clearly assured by the enacted law, because the exclusivity is not prescribed, although in practical is being applied in consistency with old regulations and overlapped applications over the same area are being not accepted (see chapter 6.3 and 8).

In relation to the conversion from exploration to mining, at the end of the exploration phase, the application for a mining license should be subsequently be subject several consecutive evaluations before being granted, all of them being based on discretionary criteria. Consequently, there is the potential risk for refusal and losing of the investments realized in exploration.

In this context, as mentioned above in point 5, the Consultant considers necessary to remind here the required conceptual differentiation between “property” and “activity”<sup>4</sup>. International experience in the last two decades has shown that one of the best ways to develop a performing institutional framework and attract investment in the mining sector has been to have a clear institutional separation between the administrative responsibilities for granting mineral licenses and the control of mining activity, including the environmental monitoring. This institutional separation of mandates is critical to guarantee most of the principles required for effective mineral rights management: transparency, lack of discretion, respect of the discoverer’s rights and lack of subjectivity.

In the legal framework of many countries, as it happens also in Myanmar, the presentation of an adequate exploitation plan is a requirement prior to the granting of a mining license. It is indeed obvious that governments must evaluate a mining project from a technical, environmental and social perspective before authorizing its implementation and the starting of operations. However, from the security of tenure point of view, the question arises as to when this evaluation should take place: before or after the granting of the mining property rights. The application of the concept of differentiation between management of “property” and “activity” can solve this question, for both the state and the title holders, on the basis of the following cadastral rules:

- Titleholders that fulfil all their obligations during the validity period of an exploration license shall have the automatic right to transform it into a mining license. The granting procedure of this new license should be the sole responsibility of the Mineral Right Cadastre.
- When applying for the new mining license, titleholders must present (among others documents) their mining plans as well as their environmental and social impact assessment and management plans. However, these plans will not be evaluated as part of the granting procedure. Rather, they will be transferred to the mining inspectorate

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<sup>4</sup> A detailed discussion about this specific issue is included in “Mineral Rights Cadastre, Promoting Transparent Access to Mineral Resources”, published by the World bank (Extractive Industries for Development Series, 4, June 2009), available at [http://siteresources.worldbank.org/EXTOGMC/Resources/ei\\_for\\_development\\_4.pdf](http://siteresources.worldbank.org/EXTOGMC/Resources/ei_for_development_4.pdf) (chapter C2)

and other entities responsible for the authorization, and later control of the mining activity. Mine development and initiation of operations shall be conditioned to the approval of a proper plans (including a closure plan), but the rejection of such plans should not imply the loss of the mineral rights.

- In cases the plans are not approved, the holder will always have the right to revise them, or, if he estimates the mining would not be profitable under more stringent conditions, to recover their exploration investment by transferring the mineral property to another holder.

The same operational principles can be applied (with the required adjustments) to other cadastral procedures, such as renewal, transfer, or cancellation of rights. They are consistent with the foundational origin of the cadastre, to simultaneously protect and guarantee the rights of both the state and the holders. Experience shows that their practical application has been essential to the successful development of the mining sector in many countries in Latin America (e.g. Argentina, Chile, Mexico, and Peru), Africa (Madagascar, R.D. Congo or the recent reforms in Mauritania) and Asia (Mongolia in the late 1990s).

It is important to remind once more that the situation described above is especially risk under the present circumstances, MONREC still participates directly as shareholder in some of the exploitation permits through the administrative departments Mining I and Mining II, and has six State Economic Enterprises (SEEs). On this respect, it must be taken into consideration (as mentioned above in point 5) the article 35 (a) where it is prescribed that the Ministry may form joint venture or partnership with the permit holder.

## 6.2.- THE LAWS AMENDING THE MYANMAR GEMSTONE LAW (LAW NO. 8/2003 and 23/2016)

In opposition to the international practice, in Myanmar the granting of gemstone rights is ruled by a separated law, different by respect the law prescribing the mining activities for standard minerals. However, in spite of this separation, the general conceptual basis in the gemstone law are very similar to the mining law and the most of the statements listed above in chapter 6.1 (potential discretions, ambiguities, lack of detailed prescriptions, lack of preconditions for tender bids, etc.) are also valid here. In addition, it should be also mentioned that:

1. There is not any mention in the text about the needs to avoid overlapping between gemstones and mineral licenses, affecting seriously the exclusivity of the mineral rights and the security of tenure.



2. There are no prescriptions about maximum size, duration, renewals, etc. In the case of the standard minerals, some of these prescriptions are detailed in regulations (see chapter 6.3), but this is not the case for the gemstone law.
3. The gemstone law is incomplete about some essential aspects in the licenses to be granted, where merely the type of licensing is described (by tender bid, by joint venture or by direct application), but where there is not differentiation about:
  - The scale of the activity to be executed (large, medium or small). Under the present regime, all the scales are mixed under the same procedure, avoiding the adequate treatment and monitoring in relation to the size of the granted area and the scale of the operation.
  - All the licenses are granted directly for exploitation and the possibility of exploration licenses, in order to incentive the research is not provided. Under the present conditions, the activity is mainly restricted to the areas where the presence of gems is known since decades ago and there is not exploration activities searching for new deposits or new potential areas.
4. As it happens in the minerals law, there is also a conceptual mixture between the mineral rights linked to the property (prospection, exploration, mining) with the activities derived from the mineral treatment and dealing, i.e. the activities for cut, polished, refurbished, shaped and sculpted finished gemstones or jewellery (see article 17).

### 6.3.- REGULATIONS (MYANMAR MINES RULES, NOTIFICATION 125/96)

Normally, consistently to the international experience, the legal basis for mineral exploration, development and production is typically established in the sectorial law. Complementary, the prescriptions that would be too detailed to be included into the law or that may need periodic adjustments (such as technical requirements, administrative procedures and administrative fees), are typically set in regulations or decrees.

Consequently, as a part of the legal framework, regulations should include the practical development and detailed instructions about how to implement the general principles established in the law and the new regulations, **very recently approved, are not yet implemented.** Under the present conditions, the licensing activities are still following procedures based on previously existing rules. It must be highlighted that although these rules are not up-dated and adapted to the amended laws, some of the principles there prescribed and presently applied are consistent to the best international practice, as for instance the availability (as annexes) of official forms and list of documents to be attached for the submission of applications, the specific prescription about the exclusivity of the mineral rights and the mention about some

cases where the tender bids can be applied. However, the existing rules are far from complete and modern regulations and there are substantial lacks for the correct management of the mineral rights, as for instance:

- There is not differentiation between licensing procedures for exploration and mining licenses. It should be considered that both activities have very different requirements and need different procedures.
- There are not specific prescriptions about the criteria to be used for granting (first come, first served).
- There are not prescriptions to coordinate the presently separated licensing procedures in order to avoid overlapping between mineral rights and gemstones permits.
- There are not provisions for the development of some procedures that may affect the existing mineral rights, as they are the tender bids or creation of reserved zones and gemstone tracts

In addition to the conceptual items mentioned above, there are also some technical and practical gaps in relation to the administrative procedures for licensing, especially for the submission and registration of applications and the subsequent granting procedures, as for instance:

- For the registration of a new application, it should be mandatory to submit the applications personally. Applications realized by courier or by post cannot be receivable.
- It should be and obligatory the use of a paper registry (ledger or log-in book) exclusive for cadastre purposes, where only the applications for mineral licenses should be registered, including the double signature (applicant and cadastre agent).
- There are not prescriptions about the cadastral reference system (coordinates, projection, spheroid and datum) to be used for positioning of the in order to guarantee their uniform positioning, to avoid overlapping conflicts and to optimize the land management.
- The prescriptions about the maximum size and duration of the permits are out of the international standards, introducing difficulties for the development of modern exploration and prospection projects and introducing risks in relation to the security of tenure (see chapter 7).
- There are not geometric restrictions for the delimitation of the mineral rights perimeters, avoiding the application and granting of irregular, aberrant or

inadequate geometries, as for instance polygons containing empty spaces or polygons linked by a corner.

- There are not specific prescriptions for the procedures to be followed in several cadastral operations which are frequently required in the management of the mineral rights, as for instance the amalgamation between adjacent licenses or the division (splitting) of one licence in several titles, because the present legal framework is silent about such possibilities.

#### 6.4.- NEW DRAFT REGULATIONS (DRAFT MINING RULES)

As mentioned in the introduction of the present chapter, the new mining regulations have been recently approved, although the English translation is not yet available and it has been not possible to evaluate the final text. In the meantime, the Consultant acceded to the Draft Mining Rules through the Myanmar EITI office and thanks to the support of from the Myanmar Centre for Responsible Business (MCRB). It is not a totally updated document (it is dated on November 2016), but is the most updated translation available in English. The revised draft is not an official document, however it can provide an objective indication about the direction where the Myanmar mining policy is moving forward, and unfortunately is evident that general principles introduced in these draft rules are opposite to the best international experience, and they are not well addressed for implementation of a good licensing methodology and an attractive system for investments. In the Consultant's opinion, the more relevant aspects to be highlighted are the following:

- Although apparently and nominally the first come, first served principle is prescribed, in fact its application is unclear and discretionary, because the granting can be realized through tender bids or using first come, first served principle (see section 8 and other equivalent articles), and the criteria to be applied for selection of one or other method are unclear.
- Additionally to the previous bullet, it is prescribed the possibility to execute tender bids for prospecting and exploration permits. The international experience indicates that tender bids only are attractive to the investors when they correspond to mining permits where the ore reserves are known (see chapter 6.5 below).
- There are not institutional definitions about licensing responsibilities. Applications must be submitted to the ministry or to the directorate (there is not more specific information in the text) and scrutinized by a Mineral Plot Scrutiny & Issuing Team. And there is not a clear differentiation between responsibilities for licensing mineral rights and other "no cadastral" authorizations as mineral processing or trading permits.
- There is the obligation of registration for applications, but there is not any mention for a specific registry book for licensing.

- There is not the explicit prescription of transparency for the cadastre files and licensing information.
- The exclusivity of the mineral rights is affected because it is authorized the overlapping between prospection or exploration permits and small-scale production or subsistence production licenses. Furthermore (see article 16), the exclusivity is considered mineral by mineral, not “real exclusivity” including all type of minerals. International experience demonstrates that this option is affecting seriously the security of tenure and discourages investment.
- The rules does not includes any restriction about the geometry of the perimeters of the mineral rights (merely it is mentioned that borders should be strait) and the text is totally silent in relation to the cartographic or geodetic parameters for positioning.
- The prescriptions about the maximum size and duration of the permits are maintained out of the international standards, without significant improvement by respect the previous rules, remaining the difficulties for the development of modern exploration and prospection projects and introducing risks in relation to the security of tenure (see chapter 7).
- The rules do not include any objective criteria to evaluate applications, leaving open the granting to the ambiguity, the subjectivity and the discretion. This situation introduces high risk and reduces the security of tenure, especially in the transition from exploration to mining.
- In opposition to the best international practice, it is allowed to apply for a Mineral Feasibility Study Permit in free areas, without a previous prospection or exploration projects. Normally, the feasibility studies are realized at the end of detailed exploration phase.

Although the text of the approved Regulations is not yet evaluated, it is known that some of the licensing responsibilities will be transferred to the State / Regions administration. On this respect, it must be highlighted that the Consultant has serious doubts about the capacity of the local administration to manage properly the licensing activities. In addition to that, it must be mentioned that international experience demonstrates that decentralization is extremely risked for the licensing activities and the security of tenure if the relationships and data transfer between central and local administrations are not properly coordinated. The Figure 19 shows the evolution of the number of new applications each year in Indonesia from 1998. This country was extremely successful attracting mining investments and by the end of the XX century had one of the more modern and advanced cadastres in the world. However, it was decentralized towards provinces and municipalities and during the first year of decentralization (2001), the number of new applications was less than

half that of the previous year. One year later, new applications were practically non-existent.

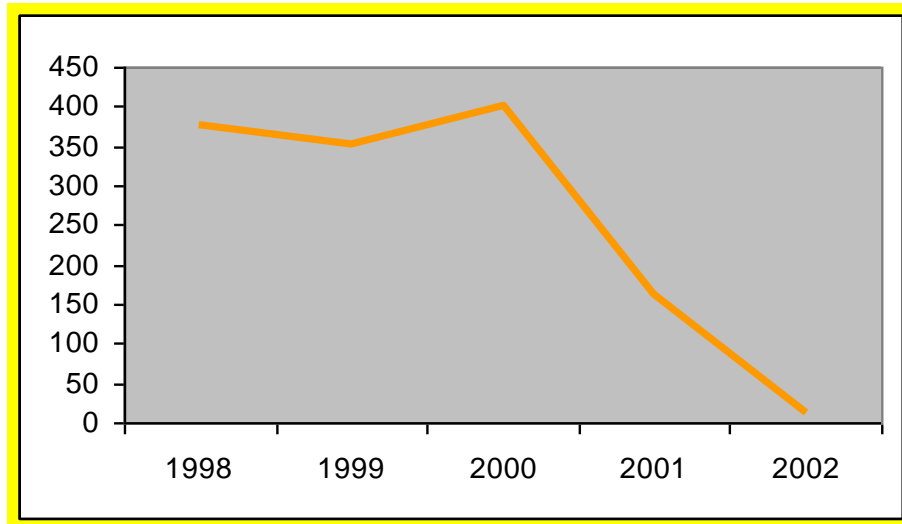


Figure 19

Experiences in several countries over the last decade has demonstrated that cadastral decentralization is suitable and operational only if a number of requirements are taken into account, and if central coordination is maintained (as decentralization does not automatically imply autonomy). Unfortunately, the particular case of Indonesia illustrates the potentially negative and immediate impacts that may result if these pre-conditions are not met.

#### 6.5.- COMPARISON BETWEEN TWO METHODOLOGIES FOR GRANTING: FIRST-COME, FIRST-SERVED VERSUS AUCTIONING

Presently there is an open discussion in many countries, especially in those that are simultaneously producers for oils & gas and solid minerals, about the selection of the best and more adequate method for granting mineral rights. As a rule, most of the petroleum licenses are allocated using the “auctioning” or “competitive” methodology, while mining licenses are generally allocated on a first-come, first served basis.

One of the major reasons for the difference between the two industries is due to the basic features of mineral and petroleum geology, which translates to the different methodologies used by mining and petroleum companies to evaluate the economic potential of acquiring exploration rights. The geology of petroleum basins and data generated by early stage exploration is used to generate relatively robust inferences about the economic potential of exploration activities within basins over which exploration rights are being offered. Petroleum basin geology is such that there is a tendency for discovery sizes to decline over time and the economic potential to be related strongly to size. Petroleum companies, therefore, tend to want to acquire

exploration rights early and governments, as a result, are normally in a fairly strong position to use their control of exploration data to manage allocation of exploration rights on a competitive basis.

In contrast, individual mineral deposits tend not to be clustered to the same extent as petroleum deposits and, for the most part, exhibit quite distinct geological characteristics. The relationship between size of a deposit, time, and economic potential is less strong and inferences about the economic potential of exploration activities within an area over which exploration rights are being offered are much less reliable than those made in petroleum exploration. As a result, governments are in a weaker position to engage in the competitive process of allocating exploration rights. A number of other points contribute to the general use of auctioning in the petroleum industry, while it is only rarely practiced in the mining sector. Some of these reasons include the greater economic attraction of petroleum exploration due to higher upside potential, the effect on the supply of petroleum exploration acreage of restricted access in many parts of the world, and features of petroleum regulation that are conducive to competitive allocation by comparison with mining regulation.

These technical differences generate also differential behaviour of the companies and administration in both sectors because:

- The success rate for an oil exploration campaign as average is 20 %, while for mineral exploration between 1 % and 2 % for base metals, and even 0.1 % for precious metals. In the mining sector, only one anomaly of every 1,000, has economic potential. Between these anomalies, one of every 100 reaches the feasibility study, and only a part of these become a profitable operation. The vast majority of mining exploration projects does not conclude with the discovery of a profitable exploitation. For this reason, oil & gas companies are ready to participate in auction processes, even if the available information is inconclusive. In opposite, mining companies are reluctant to participate in auctioning procedures when the available information is not sufficient to assess reasonably the potential size and quality of a deposit.
- The volume of cadastral activity in the petroleum sector is low. Typically, it is made up by few dozens of blocks that cover the entire surface with oil potential, and only a very small number of auctions per year is organized and only relatively large companies applies. In opposite, in the mining sector, licensing of mineral rights implies (even in medium size countries) the management of several thousand titles, with new applications and granting at levels of several dozen per week and any type of titleholder applies. It would be practically impossible to organize all the required tender bids for a standard level activity in the mining sector.

For these reasons, the “first come-first served” principle is the most frequently adopted criterion for granting mineral licenses around the world, applied in all

countries where the mining sector is well-developed. Some mining countries use the “tender bids” methodology, as the auction system is called in the mining sector. If geological knowledge about a certain deposit is strong, whether due to the Government’s own exploration campaign, or through other activities, there is a strong case to choose the auction method.

The first-come, first-served method, which has been prevalent in the granting of mineral rights for centuries, has its pros and cons. On the positive side, the removal of any discretion or subjectivity makes cadastral procedures transparent and impartial. Furthermore, the rule is easily applicable and controllable, using only the priority registry book. For these reasons, this principle is widely accepted worldwide by both titleholders and applicants.

On the other hand, some governments feel that the application of this method can lead to the granting of licenses to “inadequate” holders—for instance, those that may not have the technical or economic capacity to properly develop the mineral resources. In these cases, governments may prefer directed procedures that permit the selection of the “best” holder. But, depending on the rigor and transparency of such a directed selection process, there may be significant risks for titleholders and applicants, affecting their security of tenure. In some countries, lively debates have begun between supporters and detractors of the first-come, first-served method. Some countries have chosen to auction grants because this can:

- Guarantee transparency in the granting of licenses, if some minimal conditions are respected.
- Allow the elimination of speculators from a transaction.
- Ensure selection of a titleholder with sufficient experience and operational capacity for the exploration or exploitation of the area or deposit.

Despite these potential advantages, however, the tender bid methodology may imply important risks for discrimination and subjective evaluations (and consequently also for corruption) if some minimal required conditions are not fulfilled. To address these problems, the legal framework should determine the general guidelines for the evaluation criteria, and the announcement for each individual bidding process should give all required information for tender far enough in advance for interested parties to prepare their offers—as well as details about deadlines and documents to be presented, precise information on the particular scoring and evaluation criteria to be applied, and a minimum score that will be considered acceptable. Tender conditions, scoring, and evaluation criteria should be consistent and proportional to the information available on the potential of the area.

In general, tender bidding is to be considered in cases where the first-come, first-served method is not applicable, for instance:

- When applications overlap immediately after the revocation, relinquishment, expiration, or annulment of licenses. In this case, as the cadastral information is open to the public, many interested applicants may have the same information and apply for the same area in a short period of time. In this case, countries may auction the same opportunities to all of the overlapping applicants. For example, the mining laws in Mozambique and Peru allow for the opening of a tender bid among overlapping applications in an area that has been revoked, relinquished, expired, or annulled, provided those applications are presented during the first hour in the day after the change in status.
- When the state, through geological research by its own institutions (for instance, when developing the geological infrastructure or geological maps), discovers some new deposit or some new potentially interesting area. In this case, as the new area has been found using public funds, the information should also be considered public, and there are likely to be several potentially interested applicants.

Based on the apparent transparency and effectiveness of the auctioning process—as well as its success in the granting of oil concessions—some countries have decided to adopt it as a standard method for mining. But, as described, oil sector conditions are very different from those in mining. As a result, the use of tender bids as an exclusive methodology for granting mineral rights has not generated the positive impacts expected; in fact, in some cases, it has posed an obstacle to effective mining sector development. Because the governments using the tender bid methodology could only offer areas that have known geological potential, this process slowed down exploration, and some potentially interesting areas were completely ignored.

In cases where tender bidding is deemed appropriate for the mining sector, other practical lessons from international experience can help to improve the implementation of tender bid procedures, for instance:

- An exploration license that has been reverted to the state, whether as a result of voluntary release or of cancellation, does not need to be automatically subjected to tender bidding, except in the case of availability of pertinent data or of overlapping applications. In the latter case, the area should be declared vacant and available for granting on a first-come, first-served basis. Some countries require that all released areas be auctioned. This practice generates serious backlog problems, such as in Mongolia, where many abandoned areas, most with no particular mining interest, are subjected to the bidding process, implying an enormous amount of work for the administration. In these cases, a filter process is strongly recommended.
- Although bidding is not a default procedure for exploration licenses, it is a granting procedure under the official licensing activities and responsibilities. Bidding should, therefore, be organized and managed by



the MRC rather than the mining directorate or the GS. The MRC can cooperate with these organizations to assemble relevant data.

- In cases when the deadline for offers expires with no bids received, the areas must be declared vacant and ready to receive new license applications that will be granted on a first-come, first-served basis. This avoids the problems experienced in Mongolia.
- In order to not block private exploration over an excessive period of time, it is recommended that limitations be introduced for the duration (validity) and the number of areas that are “reserved” for state activity and will be offered afterward by tender bid. These limitations should be clearly detailed in the legal framework; for example, in Mauritania, a maximum of two reserved areas can exist simultaneously, each having a maximum validity of three years.

## 6.6.- CONCLUSIONS AND RECOMMENDATIONS

In relation to the management of the mining sector, the main difference between the Myanmar legal framework and the international standards is the existence of two different laws, one for the normal minerals and other for gemstones. It should be highlighted that other gemstone producer countries (as they are for instance Madagascar, Mozambique, Tanzania, South Africa, Namibia, Colombia or Brazil) have not such legal differentiation and the gemstone are managed by a single and unified act, normally called as minerals and mining bill or mining code.

In addition to that, as it has been stated in chapters 6.1 to 6.3, the presently enacted legal texts (laws and rules) have substantial gaps and ambiguities in relation to the international standards, making impossible an efficient and modern management of the licensing activities and affecting the transparency as well as the security of tenure and the attractiveness of the Myanmar mining sector for investments.

Nevertheless, the present situation, where the recently amended laws have been not yet complemented with regulations, open an excellent opportunity to correct some of the detected gaps and to modernize the licensing methodology introducing corrections and improvements in the draft rules under preparation (see Chapter 6.4). In addition, this situation would give the opportunity to integrate the licensing procedures for gemstones and minerals in a unified scheme, allowing the coordination and harmonization and avoiding overlapping problems. In the Consultant’s opinion and based on the international experience, the aspects or items that can be corrected or improved in new regulations are listed below (it should be reminded that such list is restricted to the issues related to licensing and cadastre):

- To introduce of clear institutional definitions of the Minerals Rights Cadastre, describing in detail their functions and responsibilities, and establishing the “Cadastre” as the unit with exclusive responsibilities for licensing, including

the reception and registering of applications, the cadastral evaluation of the application and communication with applicants and holders in relation to any matter related to the mining rights, correcting the present situation where responsibilities are ambiguously split between several departments.

- To declare explicitly that information concerning the mineral rights (including the positioning on the maps) should be public and transparent, open for public consultation.
- To introduce objective criteria to be applied for evaluation of the applications to the mineral rights, in order to avoid subjective and discriminatory decisions for granting or refusal (as for instance minimum spend rules depending on size of concession as a minimum amount of dollars to be spent per year in each granted hectare), increasing the security of tenure.
- To remove the ambiguities about the application of tender bids, prescribing in detail when a license should be granted by auctioning or by first come, first served, and giving details also about the procedures to be followed for bidding. For instance, tendering will be applicable in the special cases of the areas where the resources have been discovered by the State or where the information corresponds to the public domain. Regulations must provide also details about when and how to initiate auctioning, how to organize auctions and the requirements which should be published in advance in order to guarantee the transparency. In addition, as one of the standard licensing procedures, it should be the Mineral Right Cadastre's responsibility to initiate, develop, and grant the corresponding license.
- To introduce a better differentiation between licensing procedures for prospection / exploration and mining because they have very different requirements, needs and conditions (registration of priority, duration, receivability, risk of violation of confidentiality, etc.).
- To introduce specific cadastral procedures for creation of gemstone tracts and reserved zones, preserving the rights of existing titleholders and previous applicants.
- To prescribe standard conditions for the licenses (duration, exclusivity, fees, state participation, etc.), avoiding negotiations for agreements. International experience demonstrated that standard prefixed conditions are the best solution to avoid discretion, subjectivity and corruption, increasing transparency and security of tenure.
- To establish the obligation to submit applications personally and the mandatory use of a paper registry (ledger or log-in book) exclusive for cadastre purposes, where only the applications for mineral licenses should be registered, including the double signature (applicant and cadastre agent).

- To determine without ambiguities the conditions (minimum data and information) for considering receivable an application, avoiding ambiguities and discretionary decisions.
- To restrict the application of Mineral Feasibility Study Permit to the holders of exploration permits and the areas explored during the period validity of the license.
- To introduce different level of activities (large, medium or small scales) also to facilitate the possibility the exploration projects. Under the present regime, all the scales are mixed under the same procedure, avoiding the adequate treatment and monitoring in relation to the size of the granted area and the scale of the operation. Furthermore, the present types of license, the activity is practically restricted to the areas where the presence of gems is known since decades ago and there are not exploration activities searching for new deposits or new potential areas.
- To include the cartographic and geodetic bases for the precise positioning of the mineral rights, prescribing the technical parameters to be used (coordinates, projection, spheroid and datum) in order to guarantee their uniform positioning, to avoid overlapping conflicts and to optimize the land management, adopting the 1:50.000 maps as cadastral maps and the UTM as cadastral coordinates.
- To introduce geometry restrictions for licenses, permits, tracts and blocks, avoiding the application and granting of aberrant or inadequate geometries, as for instance polygons containing empty spaces or polygons linked by their respective corners.
- To precise details about the procedures to be followed in several cadastral operations which are frequently required in the management of the mineral rights, as for instance the amalgamation between adjacent licenses or the division (splitting) of one licence in several titles, because the present legal framework is silent about such possibilities.
- To correct the present practice about making mandatory the joint venture

In the Consultant's opinion, it is extremely difficult to correct adequately the deficiencies listed above by simple amendments and it would be advisable to consider as option (if really it is desired to develop the mining sector) to consider the possibility for drafting a complete new legal framework, unifying gems and minerals in a single context, establishing the institutional basis for a mineral rights cadastre and implementing licensing procedures consistently to the international standards.

## 7. STRUCTURE OF THE MINERAL RIGHTS

### 7.1.- ANALYSIS OF THE EXISTING MINERAL RIGHTS

Table I below summarize the present structure of mineral rights in Republic of the Union of Myanmar, integrated by eleven types of licenses and sub-licenses. It must be clarified that in Table I it have been not included the trading and processing licenses because they no correspond to the mineral rights, they are not linked to a specific mineral title and consequently should be not considered in cadastral licensing analysis.

From a general point of view, the information contained in this Table shows how the structure of the minerals rights in Republic of the Union of Myanmar is far away from the practice in the most of the countries and where in the Consultant's opinion and based on the best international experience, a more simple model could be advisable. In fact, the list of Table II is still more complicated if we consider that some of the titles can be split between local and foreign investments.

TYPE	Max. Duration and renewals (years)	Max. Area (old law)	Max. Area (new law)
Prospection	1 + 1	700 Km2	
Exploration <sup>5</sup>	3 + 1 + 1	500 Km2	
Feasibility	1	--	--
Production Large scale	50 + 5	3150 Km2	2100 Km2
Production Medium scale	15	--	1 km2
Production Small scale	10+1+1+1+1	50 acres	20 acres
Production subsistence	1 + 1	1 acre	1 acre
Gemstone Private Exploration	3 + 3	1 acre	1 acre
Gemstone JV Exploration	3 + 3	2 acres	2 acres
Gemstone Private mining	3 + 3	1 acre	1 acre
Gemstone JV mining	3 + 3	2 acres	2 acres

Table II

It is important to take into consideration that these issues do not correspond merely to some administrative questions because the problems derived from the structure of the mineral rights may affect significantly the security of tenure and the attractiveness of the Republic of the Union of Myanmar mining sector.

<sup>5</sup> The table does not contain details about large scale and small scale exploration licenses, as presently applied, because such differentiation is not prescribed in the legal texts.

Practical experience in countries as Peru, demonstrated the importance of separation between the management of the "property" and the "activity" (as discussed in chapters 4 and 5), allowing an extreme simplification in the structure of the mineral rights, permitting to manage all the types of activities and all scales of operation with a single and unique type of license. Under this Peruvian scheme, the starting of any operation is conditioned to the previous approval of the exploration or mining plan, which is realized after granting of the mineral right. It should be highlighted that such system has been successful to harmonize and to make feasible the coexistence of large – scale and small - scale mining operations. This extreme simplification is probably excessive in relation to the traditions and uses in Republic of the Union of Myanmar and its surrounding region, although in any case the number of existing license types is today too high.

Additionally, it should be also evaluated if the characteristics of each one of these license types are consistent with the worldwide prospecting and mining practices, and furthermore appropriate to attract the investments. On this issue, one of the essential parameters to be considered in the diagnostic is the maximum surface area allowed for each type of license. This parameter is very important from the practical point of view, because the inappropriate limitation of these dimensions may make difficult the exploration (or more rarely the mining) activities.

	Maximum Allowed Area (Hectares)				Maximum Allowed Duration (years)	
	Prospection	Exploration	Exploitation	Small Scale Mining	Exploration	Mining rights
Peru	No limit	No limit	No limit	No limit	No limit	No limit
R.D. Congo	No limit	40,000	40,000	Not fixed	15	15
Mozambique	100,000	25,000	25,000	4	10	25
Mauritania	No limit	150,000	150,000	200	9	30
Zambia	No limit	100,000	25,000	400	7	25
Malawi	10,000,000	250,000	25,000	2	7	25
<b>Myanmar (Today)</b>	<b>70,000</b>	<b>50,000</b>	<b>Dep. size</b>	<b>1-20 acres</b>	<b>5</b>	<b>55</b>
<b>Myanmar (Draft)<sup>6</sup></b>	<b>70,000 - 20</b>	<b>----</b>	<b>----</b>	<b>1-20 acres</b>	<b>5</b>	<b>55</b>

Table III

The values adopted in Republic of the Union of Myanmar for the prospection and exploration licenses (Table III) are in some cases acceptable in comparison with the international standards. However, two negative aspects should be highlighted:

- The size of the prospection licenses is relatively small range by respect the international standards, and they are not attractive for modern large - scale prospection projects based on high - tech technology as airborne

<sup>6</sup> Values to be confirmed when new regulations will be translated and accessible.

geophysics or remote sensing, which usually needs large areas.

- The size of the small scale mining and gemstone licenses is too small, far away from the international standards where the minimum grantable area is newer smaller than one hectare.

Unfortunately, these values have been not corrected in the new draft regulations (see the bottom line in Table III), remaining far away from the international standards and being not attractive for investments.

Other parameter to be considered, complementary to the area, is the duration (maximum allowed validity period) of mineral rights, where two very different criteria should be taken into consideration for exploration and mining. In the case of exploration rights, the duration should be sufficient to accomplish a standard prospecting project, including the period from preliminary exploration until the decision to mine after the feasibility study. Otherwise, the titleholder would be obliged to take risky decisions to start mining without the required information, or lose the discovered resources if the conversion from exploration license to the corresponding mining lease is not decided in time. For this reason, the worldwide average for the duration of the exploration licenses is about 9 or 10 years, nearly the double of the duration prescribed in the Republic of the Union of Myanmar, which is consequently too short.

In the case of mining rights, the duration should be sufficient for the exploitation of all the discovered resources to take place in order to ensure the recovery of the investments consistent with the feasibility study. For this reason, most countries grant mining leases with durations between 20 – 30 years with unlimited renewals for similar period. On this respect, the Republic of the Union of Myanmar is also within the international standards, with 50 years for the first validity period. However, after that the title could be extended only for 5 additional years and these restrictions, in the case of very large deposits, could be not enough. As example of simplification, it could be again illustrative the case of Peru. As it shown in Table III, in addition to have only a single type of license, there is not any restriction about the maximum allowed size or duration for the licenses.

In the same way that it has been mentioned above, the maximum duration of the exploration permit has been not modified in the new draft regulations (see the bottom line in Table III), remaining far away from the international standards and being not attractive for investments.

In relation to the administrative tools normally used to discourage the passive and speculative practice, the international experience demonstrates that the more efficient is the implementation of escalating annual rental fees, making more expensive the holding of each surface unit along the. This measure encourages fast prospecting projects to avoid the high rental fees, but without introducing unnecessary risks

affecting the security of tenure, discouraging in the meantime the passive speculation.

In the Republic of the Union of Myanmar the level of the annual rental fees is quite consistent with the international standards and furthermore they are applied progressively (escalating) consistently to the best international practice (see Table IV, where it has been included representative examples of the annual US Dollar per hectare presently applied in several countries). However, it must be considered that these fees are normally considered (in addition to the rental fee as compensation to the right to prospect, to explore or to exploit a piece of land) also as a payment for a cadastral service, i.e. the management of the title during the validity period and its corresponding security of tenure. Taking into consideration the situation of the licensing activities and the cadastral management in Myanmar, it seems that the quality of such services is not proportional to the level of the applied fees.

COUNTRY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	
BRAZIL	1,14	1,14	1,14	1,14	1,14	1,14	1,14	1,14	1,14	
CANADA	5	5	5	5	5	5	5	5	5	
CHILE	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1	
GHANA	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	
MADAGASCAR	0,2	0,2	0,4	0,4	0,8	0,8	1	1	1	
MAURITANIA	0,1	0,2	0,3	0,4	0,6	0,8	1,2	1,4	1,6	
MEXICO	0,16	0,5	0,5	1	1	1	1	1	1	
MONGOLIA	0,5	1	2	3	4	5	10	15	20	
NAMIBIA	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	
PAPUA NEW GUINEE	3,4	3,4	3,4	3,4	3,4	3,4	3,4	3,4	3,4	
PERU	2	2	4	4	6	6	8	8	10	
TANZANIA	0,3	0,3	0,3	0,5	0,5	0,5	0,8	0,8	0,8	
ZAMBIA	0,2	0,2	0,4	0,4	0,8	0,8	0,17	0,17	0,17	
VIETNAM	0,2	0,3-0,4	0,5	0,5	0,5	0,5	0,5	0,5	0,5	
MYANMAR	PROSPECTING		EXPLORATION				FEASIBILITY			
Ind. Minerals	0,38	0,75	0,75	1,50	3,00	4,50	6,00	6,00	9,00	
Metals	0,75	1,50	1,50	3,00	6,00	9,00	12,00	12,00	12,00	
Precious Metals	1,50	3,00	3,00	6,00	12,00	18,00	24,01	24,01	24,01	

Table IV

In any case, it must be highlighted that any comparison between fees from different countries must be made very carefully, because fee levels necessarily change from one country to other, according to the different standards and economic levels. In principle and ideally, the rental fee level must be expensive enough to avoid speculation, but in the same time cheap enough to be attractive. Consequently, the level must be appropriate and balanced to the situation and peculiarities of each country. From the conceptual point of view, it is important to remember that the final objective of escalating fees is to stimulate voluntary relinquishment and not exclusively to increase the incomes generated by the rental fees. The real wealth of the mining activity is generated during the exploitation phase, and the final goal must be to stimulate (not to oblige) the transition from prospecting to mining.

## 7.2.- CONCLUSIONS AND RECOMMENDATIONS

The structure of the minerals rights in Republic of the Union of Myanmar is far away from the international standards and the present situation is artificially complex, making difficult the cadastral management, affecting the security of tenure and constraining the attractiveness of the country for investments. Unfortunately, the recently amended laws and the existing draft regulations are not correcting the detected problems.

However, taking into consideration that the law is silent in relation to these issues which are prescribed in the regulations, it would be relatively simple to improve the mineral rights structure by improvement of the draft rules in the following items:

- d. To increase the maximum size of the prospection licenses, allowing the development of modern large - scale prospection based on high - tech technology as airborne geophysics or remote sensing.
- e. To increase the minimum size of the small scale mining and gemstone licenses, adopting the international standards for a prefixed cadastral grid.
- f. To increase maximum allowed validity period for the exploration permits until 9 – 10 years, consistently to the world average duration for an exploration project and reducing the risk linked to advance the decisions for transformation into mining project.



## **8. DIAGNOSIS OF THE CADASTRAL PROCEDURES**

The objective of this chapter is to discuss the practical problems strictly based on the applied cadastral procedures, independently of the institutional, technical or legal constraints discussed above. In first place, it should be highlighted that cadastral procedures currently applied for licensing in Republic of the Union of Myanmar are not efficient in terms of transparency, being far away from the international standard for licensing, and their potential risks affecting the security of tenure are high.

### **8.1 PROCEDURES FOR APPLICATION AND GRANTING OF PROSPECTION, EXPLORATION AND MINING LICENSES.**

The different steps in the procedures for application and granting of a prospection, exploration or mining license are summarized below, step by step, and have been graphically represented in Figure 20.

1. The applicants and clients have not free access to the cadastre files and maps in the screen of computerized cadastre system, in order to know the areas which are free and available for new applications. For consequent, any new application is blind, without knowing previously if the area to be applied is vacant or occupied.
2. Application submitted in duplicate to MONREC headquarters, where it is registered (only the date) jointly with any other documents or paper mail in a general registry book. Applications submitted by mail or courier are accepted. One copy of the application dossier is given back to the applicant as submission certificate.
3. The application is scrutinized in the ministry in order to check if it is complete (all the required documents are there) and the documents are valid.
4. The application is submitted to the corresponding department (DGSE, Mining 1, Mining 2 or DOM), depending on the type of application) to check if the applied area is vacant or there is overlapping with previous licenses. Due to the cartographic errors and the uncertainty in positioning (see chapter 3), and in order to avoid overlapping, a buffer area of 200 acres wide is always leaved between neighbour polygons and as consequence they are never adjacent.
5. If the area is free, the application is sent back to MONREC headquarters.
6. The MONREC submit application to the State/Region Chief Minister and requests comments on the permit.
7. In the State/Region, re-submit the application to the Township Administration (even reaching in some cases the village administration for

- public consultation) to collect comments related to field checking of the administrative committee, the Forest Department, the Tax and Revenue Department, the Land Records Department and the Irrigation Department.
8. The Township Administration collects all the information and is reported back to State/Region Chief Minister.
  9. After approval by the State/Region Chief Minister (or if it is the case, the State/Regional Cabinet), the applications dossiers come back to MONREC and DGSE or DOM, who requests to the applicant the Environmental Management Plan (EMP).
  10. After reception of the EMP, it is sent to the Environmental Conservation Department and the Union Forest Department for comments. Additionally, if within the applied area there is some forest area, the Union Forest Department requests State/Region Forest Department for additional information on the Forest Land Areas.
  11. The State/Region Administration transfer the information to the Township Forest Department for comments.
  12. The comments, through the State/Region Forest Department, are sent back to the Union Forest Department.
  13. The Union Forest Department determines what Forest Land Areas can be authorized for the exploration or mining activities within the applied area.
  14. After the clearance from Union Forest Department the DGSE or DOM drafts licensing agreement and send for revision simultaneously to Union Attorney General (AG), Ministry of Commerce (MC) and Ministry of Planning and Finance (MPF).
  15. After clearance from AG, MC and MPF, the application is scrutinized and evaluated in the MONREC executive committee.
  16. After approval in the MONREC executive committee, the application is scrutinized and evaluated in the Union Economic Committee.
  17. After approval in Union Economic Committee, the application is scrutinized and evaluated in Government Cabinet.
  18. After approval in the Government Cabinet, the application is finally granted.

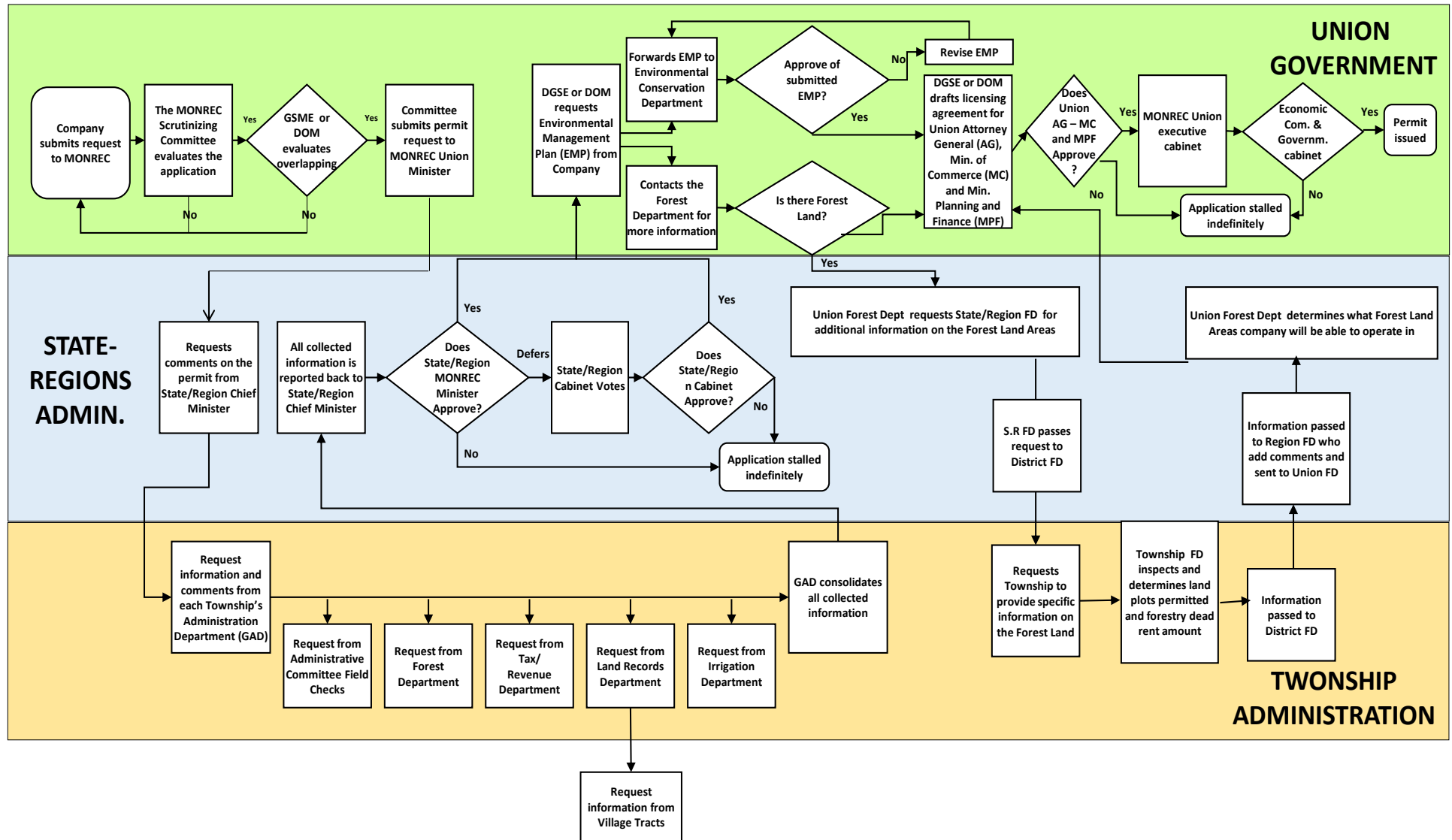


Figure 20<sup>7</sup>

<sup>7</sup> Based on the information provided (as case history) by a mining company and integrated with the information provided by DGSE, revised and modified by the Consultant.

It should be highlighted that the average duration of the procedures described above is about two years, and sometimes is even longer, and consequently very far of the licensing best practice, where a license should be granted and issued few months after application.

## 8.2.- CONCEPTUAL STATEMENTS ABOUT PROCEDURES FOR APPLICATION AND GRANTING OF PROSPECTION, EXPLORATION AND MINING LICENSES

The cadastral procedures described above are complex, fragmented (because they imply the participation of many institutions) and includes unnecessary steps. In addition, the design is not consistent with the internationally accepted conceptual basis for licensing, as for instance:

- a) Access to the cadastral information.- The applicants and interested public in general have not access to the cadastral data and maps because they are not open for public consultation. This situation affects seriously the transparency in the licensing procedures.
- b) No institutional responsibilities clearly delimited and defined. The lack of a cadastral unit exclusively devoted to the licensing activities avoid the availability of unified and updated maps and registries
- c) Risks to the applicants about area confidentiality. Before registration, the applicant is obliged to indicate to the mining Administration the position of the area where he is interested, losing the confidentiality that normally should protect such type of information (especially for the prospecting and exploration permits) and making possible potential violations of the priority.
- d) “First came, first served”.- Although in the present licensing methodology the accepted granting criteria is first came, first served, it is impossible for the MONREC to guarantee the preservation of the priority, to avoid overlaps and conflicts and to respect with total security the rights of applicants and holders, affecting consequently the security of tenure and the transparency.
- e) Differentiation between prospecting, exploration and mining.- The present procedures does not differentiates between licensing procedures for prospection / exploration and mining and are not taking into consideration the considerable differences required in registration of priority, duration, receivability and risks of violation of confidentiality for each one of these types of permits.

- f) *Erroneous application of the legal texts.*- Present legal texts do not makes differences between large scale and small scale exploration licenses. However, procedures follow separate evaluation (in GSED or Mining I departments) depending on the scale.
- g) *Erroneous application of Regulations.*- The articles 83 and 84 of regulations, where it is prescribed respectively that “*The Ministry may, ... enter into agreements relating to mineral prospecting, mineral exploration and large scale or small scale mineral production*”, or “*Any person or organization may enter into joint venture agreements...*” are being erroneously applied because any applicant is being obliged to sign an “Production Shared Contract where the State participation is fixed for the small scale licenses (70 % for the holder and 30% for the State) and variable (negotiated and depending on the final economic balance), for the large scale licenses. This mandatory condition has not legal basis and in practical represents an additional tax and violation for the security of tenure, discouraging investments.
- h) In the present procedures, during a period of uncertain duration, when several steps in the licensing procedures are under responsibility of the State / Region administration, MONREC loss the control of the procedures, where the duration is not limited due to the absence of established deadlines. This situation is extremely risky and insecure for the applicants (the waiting period is unknown and unlimited) but also for MONREC, due to the loss of control on his institutional duties and responsibilities.

### 8.3. PRACTICAL AND OPERATIONAL CONCEPTUAL STATEMENTS ABOUT PROCEDURES FOR APPLICATION AND GRANTING OF PROSPECTION, EXPLORATION AND MINING LICENSES

In addition to the conceptual defaults described in the previous chapter, there are technical, practical and operational gaps that contribute also to the lack of transparency and attractiveness, as for instance:

- a) *Registration Methodology.*-There is not an exclusive registry book for cadastral activities or for licensing. The applications and submissions are registered in a general log-on book, jointly with any other type of documents. It should be highlighted that the Registry Book of applications for new licenses is normally considered as the most important document in the licensing methodology and for such reason the design and procedure for registering must be carefully conceived and fulfilled. Unfortunately, the present procedure for registering in Republic of the Union of Myanmar has a serious gap on this respect.



Figure 21

The Figure 21 shows the different registry books presently used in DOM that unfortunately does not fulfil the best practice for registering, because:

- The registration takes place after granting, when the cadastral dossiers arrives to the DOM office and not linked to the application. Consequently has not validity to demonstrate the priority.
- There is not a unified registry for all the mineral rights and there is a separate registry for each type of license.

Other problem related to the registration is that presently it is accepted the applications submitted by courier or mail applications, without the applicant's personal presence, without signature and consequently without guaranties for respecting the priority.

- b) *Application certificate*. -Other substantial gap in the cadastral procedures, has been detected immediately after the registration, because the applicant does not receive an acknowledgement of receipt or a mandatory stamped copy of the application letter or form, indicating the time and date of the application, valid as an Application Certificate. Under the present circumstances, in case of administrative errors during the registration, the applicant has not security about the respect to the chronology of the applications order.

- c) Cadastral Maps and overlapping verification.- The present cadastral practices, splitting the cartographic information between several departments avoid the availability of complete and updated cadastral map. Under these circumstances the overlapping analysis cannot be properly executed and may affect the security of tenure, introducing substantial risks for the applicants and titleholders. Furthermore, the maps used for licensing are the old Lambert edition, where the transformation algorithm to convert the coordinates into the FGS84 (GPS) system is not available, and potential errors over the 200 meters may exist.

Furthermore, in the presently existing cadastral maps (at least in the GIS system) they are represented only the granted titles, not the pending applications. Consequently, the polygons corresponding to the areas applied but not yet granted are not considered in the overlapping analysis, and the security of tenure may be seriously affected.



Figure 22

- d) Inadequate Codification and Filing System.- The methodology presently used for codification of the applications and granted licenses needs to be improved, integrating all types of licenses in a single numeric sequence, avoiding the

presence of several numeric sequences running in parallel, as it is happening today with the different codes assigned in each department for each type of license, where furthermore the sequence for each one of these groups of licenses is started from number one year by year.

In addition to the difficulties linked to the physical separation and the absence of a unified cadastral archive, each department uses different filing criteria. For instance, the DGSE is ordering the dossiers by alphabetic order depending on titleholders or substances (see Figure 22). This filing methodology generates many difficulties for data retrieval and produces, as it has been demonstrated in many countries, time wasting in licensing, especially when the number of applications and licenses increases.

- e) *Lack of intermediate deadlines.*- Many of the intermediate steps in present procedures have not fixed deadlines and as consequence many applications are pending indefinitely without cancellation of the procedure. These ambiguities may create uncertainties that (based in the international experience) may be playing as discouraging factor for investments. To correct these potential problems, it would be necessary to prescribe fixed deadlines and to criteria, if the deadlines are not respected, to annul the procedures

#### 8.4. PROCEDURES AT STATE AND REGION LEVEL

As detailed in the description of the licensing procedure in chapter 8.1, the application dossier is transferred to the state / region administration between steps 6 and 9. The visits realized to Mandalay and Mogok during the second mission have been focussed on the decentralized MONREC offices and did not allowed to evaluate these episodes in the licensing procedure. Such evaluated will be realized during the third mission.

#### 8.5.- PROCEDURES FOR GEMSTONE LICENSES

The procedures for application and granting gemstones licenses are different by respect the titles linked to standard minerals. They are managed directly by the Licensing Division in the MGE Department, responsible for the delimitation of the areas preselected for this type of minerals, called “tracts” (see Figure 23 as example).

Presently, five of these tracts have been delimited and depending on the type of application, three different procedures may be applied:

1. If the applicant is private (individual), he can access to cadastral maps and select by himself the area where he is interested. The availability of the area is checked in the field by MGE and the application is scrutinized sequentially first by a “lower committee” followed by the “upper committee”, both belonging to the MGE, having the capacity for granting. The size of the



permit is always 1 acre, the duration is 3 years (that could be extended other additional 3 years).



Figure 23

In the same way that it happens to the standard permits, due to the cartographic errors and the uncertainty in positioning, a buffer area of 100 acres wide is always leaved between neighbour polygons in order to avoid overlapping and as consequence they are never adjacent. However, the very small size of the gemstone permits generates a very low rate in the utilization of the land, remaining significantly underused (see Figure 24)

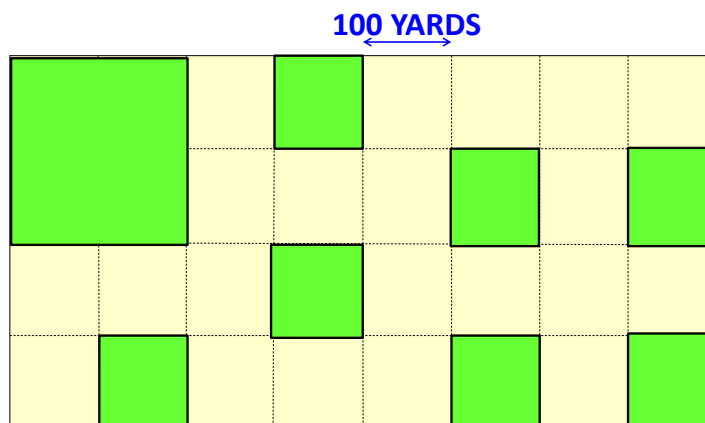


Figure 24

The granting criteria is “first come, first served” and for this purpose and to establish the priority, applications are registered in a specific registry book (see Figure 25), where it is included the signature of the applicant and the Licensing Division agent. However, during the visit realized to the Mogok office it has been stated that sometimes, in case of overlapped applications, the preference is given to the applicant who hold the right to access to the land, and not the first applicant. The large majority of this type of applications is included inside one of the existing track (over 99 %) although they may be also in free areas outside the pre – selected areas.

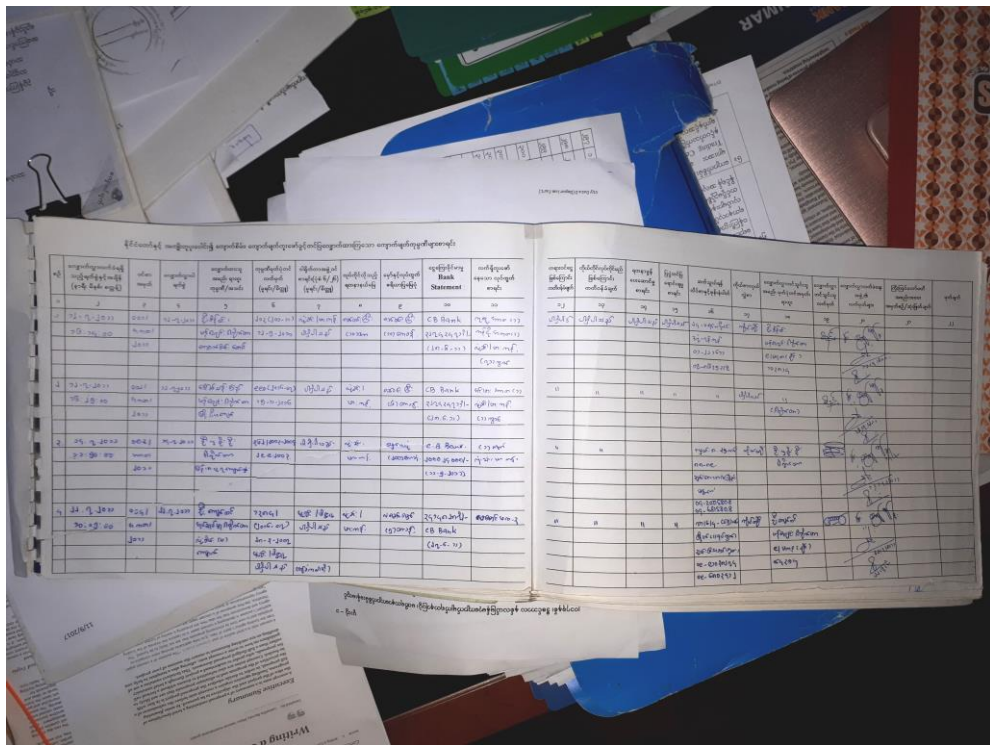


Figure 25

2. The MGE select areas, always inside the tracts, to be tendered and makes public the information. In this case, the only authorized applicants are companies, the size of the tendered areas is 2 acres and the duration of the permit is also 3 years that could be extended other additional 3 years. The granting criteria are exclusively economic and the Upper Committee selects the best (the more expensive) offer. In this case, the reception of the applications is realized through specific boxes placed “ad hoc” in the hall of the MGE Licensing Division (see Figure 26).
3. The applicant looks for a joint venture with MGE. In this case, the procedure is identical to the describe above in 1., with the only difference the in this

case the initial validity period is 5 years and the permit could be extended for 3 years and one more additional year. The percentage of participation is not negotiated, being established at 20 % for MGE and 80% for the applicant.



Figure 26

It must be highlighted that licensing procedures for gemstone are much closer to the international standards for licensing that those for standard minerals as described in chapter 8.1. Furthermore, the entire processing is developed under the responsibility of the Licensing Division, playing the institutional role as a real cadastre. However, unfortunately this scheme is restricted to the gemstone permits, there is not interaction with the licensing procedures for prospection, exploration and mining permits, and even the potential overlapping between gemstone and standard permits is not being verified, affecting consequently the security of tenure.

## 8.6. CONCLUSSIONS AND RECOMMENDATIONS

With the only exception of the procedures applied for the gemstone permits (see chapter 8.5 above), the present methodology for licensing does not guarantee the rights of applicants and titleholders because is not transparent, is not efficient and do not preserve the priority. This situation creates double damage: for the administration (because of loss of credibility and rigor) and for the applicant because there are risks of losing priority and the discovery rights. The present bad practices may be undoubtedly the origin of cadastral problems and conflicts, and furthermore is

affecting very negatively the attractiveness of the Republic of the Union of Myanmar for investments. Consequently, it is strongly recommended to modify the present licensing sequence in line with international standard methodology.

It should be reminded that some of procedural problems are created by the legal vagueness resulting from the Law and regulations; in particular the lack of specific criteria for evaluation of applications before granting introduces serious risks for security of tenure. Gaps in the institutional organization and the legal texts are transferred to the present licensing practice, and decisions for rejecting or granting are taken in the absence of precise guidelines on how to avoid subjective or potentially discretionary criteria, as it has been already commented in chapter 6. Additionally, the licensing procedures would be easily improved in conceptual and practical matters by implementation of simple changes, totally compatible with the existing legislation, as they are for instance:

- To make accessible to the public the cadastral maps and cadastral information, allowing to the applicants to know in advance the vacant areas available for new applications.
- To implement different procedures in the application for prospection, exploration and mining rights.
- To implement improvements in the registration methodology, introducing a model of Registry book able to be signed by the applicant and the Administration representative.

N° D'enregistre- ment	Date de Demande					Nom du Demandeur (personne physique ou morale)	Type de Titre	Groupe de substance	Surface demandée (km <sup>2</sup> )	Signature du Demandeur	Signature de l'officiel du C.M
	J	M	A	H	M						
1036	13	05	2010	10	10	EPCG	B	2	1000	[Signature]	[Signature]
1037	13	05	2010	10	15	EPCG	B	2	968	[Signature]	[Signature]
1038	13	05	2010	15	15	ALACTO HOLDINGS International	B	2	529	[Signature]	[Signature]
1039	13	05	2010	15	20	Alacto Holdings International Ltd	B	2	758	[Signature]	[Signature]
1040	13	05	2010	15	25	Alacto Holdings International Ltd	B	2	615	[Signature]	[Signature]
1041	13	05	2010	15	30	Alacto Holdings International Ltd	B	4	888	[Signature]	[Signature]
1042	13	05	2010	15	35	Alacto Holdings International Ltd	B	4	904	[Signature]	[Signature]
Arrêté le nombre de demande eu date de ce jour 5 sept (04)											[Signature]

Figure 27

The information to be registered must include as mandatory fields the sequential number, application date, hour and minute, applicant's name, type

of applied license, applied area (hectares), applicant signature and cadastre officer signature. As example, the Figure 27 shows the Registry book belonging to the Mauritania Mineral Rights Cadastre. This methodology for registration, increase the security of tenure and reduces the risks of violation of the priority, preserving the confidentiality of the information about the area to be applied. It should be mentioned that the proposed model is not very different from the registry book presently used in MGE, although merely for private applicants to gemstone permits (see Figure 25).

- To concentrate all the cadastre documents in a single and exclusive archive, where all the documents related to the licenses should be stored. For the normal daily work, the required information should be accessed digitally from the databases (when available), and when it is required to check or to consult the paper dossiers, such consultation should be realized in the archive, without withdrawing any document.
- To issue an application certificate immediately after the registration in order to provide to the applicant an official acknowledgement of receipt, duly stamped and signed, transmitting security on the chronology of the application,
- To improve de design of the licensing procedures, fixing deadlines in the intermediate steps in order to avoid unlimited waiting periods and avoiding also that MONREC loss of control when the dossier is transferred to the of the region / states administration.
- To improve de design of the licensing procedures, guaranteeing the respect of the legal texts and avoiding discretionary decisions without legal basis, as for instance the differentiation between large scale and small scale exploration licenses, or the arbitrary interpretation of articles 83 and 84 in Regulations, making mandatory the signature of a joint venture implying a “Production Shared Contract” and the acceptance of gratuity in the State participation. This mandatory condition has not legal basis and in practical represents an additional tax and the violation for the security of tenure, discouraging investments.
- To concentrate the cartographic position of all the existing rights in a single, unified and updated cadastral map based on UTM coordinates, allowing the adequate verification of overlapping. Such map must contain furthermore all the pending applications, as well as the areas restricted to the mining activities and the reserved zones (which presently are only the tracts for gemstones).

- To establish predefined deadlines for the intermediate steps in procedures, avoiding undefined waiting periods, uncertainties and discouragement of investors.
- To adopt an adequate codification methodology based on a single and unique numeric sequence, integrating all the types of licenses, and the file all the cadastral documents in single archive, being classified following this numeric code. As example, the Figure 28 shows the archives of mineral rights cadastre in Nigeria, R.D. Congo, Algiers and Peru.



Figure 28

## 9. STATUS OF THE CADASTRAL DATA AND LICENSING SITUATION

Taking into consideration that standard mineral licenses and gemstone permits are managed under different legal regimes and following different licensing procedures, their respective situation will be analysed separately.

It is also important to remind that present cadastral situation is static (although normally would be very dynamic and in continuous evolution, because the number of titles and applications is changing day by day, because the reception and granting of new applications is closed since 1016. Consequently, is not significant to realize (as it would be normally recommended) a detailed analysis of the recent cadastral activity and evolution.

### 9.1.- STANDARD PERMITS

The deficiencies and issues related to licensing in Republic of the Union of Myanmar described in the previous chapters cannot be merely considered as administrative troubles, because they affect deeply the development of the mining sector, as it is clearly reflected in the number and distribution of the existing licenses. As it shown in Table V, there are currently in Myanmar 1,245 permits for standard minerals, 24 for “large scale exploration”, 368 for “small scale exploration”, 153 for large-scale mining, 633 for small scale mining, 39 for subsistence (artisanal mining) and 28 for feasibility study.

License	Type	Number	%
Prospection		0	0,0
Exploration	Large scale	24	1,9
Exploration	Small scale	368	29,6
Mining	Large scale	153	12,3
Mining	Small scale	633	50,8
Mining	Subsistence	39	3,1
Mining	Feasibility	28	2,2
<b>Total Standard Minerals</b>		<b>1.245</b>	<b>100,0</b>

Table V

Based on these figures and from the global point of view, the dimensions of the Republic of the Union of Myanmar cadastre could be considered as small, at least for the standard minerals. It should be taken into consideration that large-scale cadastres have about 60,000 cadastral dossiers in total and it is receiving as average 150 new applications each week. Other similar medium-scale cadastres are for instance Madagascar or Congo, having an average of several tens of applications per week and several thousand cadastral dossiers in total. Furthermore, the distribution of the

figures in Table V, by comparison with international standards, is very atypical and reflects clearly an anomalous behaviour of the Myanmar mining sector.

In first place, the absence of prospecting permits, confirms (as it was stated in chapter 7.1 that the size of the prospection licenses is too small and not attractive for modern large - scale prospection projects based on high - tech technology. For this reason, nobody applied this type of permit and applies directly to the exploration permits.

In second place, it should be highlighted the anomalous proportion between exploration mining licenses, where the mining are much more abundant than exploration, when normally it should be the opposite. As it is well known, as a world average, only 1% of the exploration projects reach the mining phase and for this reason, worldwide in the mining cadastre the most of the licenses are exploration type and only a minority corresponds to mining. The reverse situation existing in Myanmar indicates clearly that the dominant tendency is not to develop really detailed exploration projects, evolving rapidly to the exploitation. This anomalous behaviour could be partially explained because the too short duration of the maximum validity period allowed for the exploration permits. As explained in chapter 7.1, the average duration for an exploration project is 10 years, the double of the duration provided in Myanmar, and probably many titleholders have been obliged to move towards mining licenses in order to avoid losing the rights over the discovered resources, even if they are not yet completely evaluated.

In third place, it is also remarkable that more than two thirds of the licenses, **between exploration and mining**, corresponds to small scale permits, indicating (consistently to the second point started above) that the Myanmar territory is presently underexplored and the present level of development of the Myanmar mining sector is not proportional to the geologic and metallogenic potential.

In relation to the situation of the cadastral information, it is properly stored and maintained, the documents are clean and well maintained, although as detailed in chapter 8, the present methodology for codification and filing needs deep improvement (see Figures 13, 14 and 22). But the level of computerization is very low and extremely irregular. The information digitally stored would be sufficient for cadastral management, but unfortunately it is scattered between several computers placed in different departments, not linked by network or intranet, and using different software and format, making impossible the integration in a unified and single database. As example, the Table VI shows the information fields existing in DGSE (attributes table in the GIS) and in DOM, where the information is stored in a domestic application of Excel. The comparison between both lists indicates that the DOM files are in principle more complete, although in fact, some essential information is missing because the application date is empty in the most of the records, and in some cases correspond to the date where the information was recorded in the computer, and not the real application date.



DGSE	DOM
Company name	Company name
Mineral	Mineral
Nation	
State	State
Township	Township
Locality	Locality
Status	
Map sheet number	Map sheet number
Area (Km2)	
Application date	Application date
Area (acres)	
	Type of permit
	Granted duration
	Expiry date
	Registry number
	Code (permit number)

Table VI



Figure 29

In addition, it should be also mentioned that the use of the computers is not adequate because, moreover the lack of digital communication and digital data transfer between the different the stand alone terminals, the information stored is handled and treated as if it were analogical information, working on the screen as if it were a paper map. The Figures 29 and 30 shows the GIS installed in DGSE, where the polygons (ordered by titleholder's name) are linked to the alphanumeric information listed in left column in Table VI, but only for displaying in the screen, not real GIS operations or database capacities are being exploited. The situation in DOM is even more limited because the data stored in the right column in Table VI is not linked to the graphic information in the GIS.

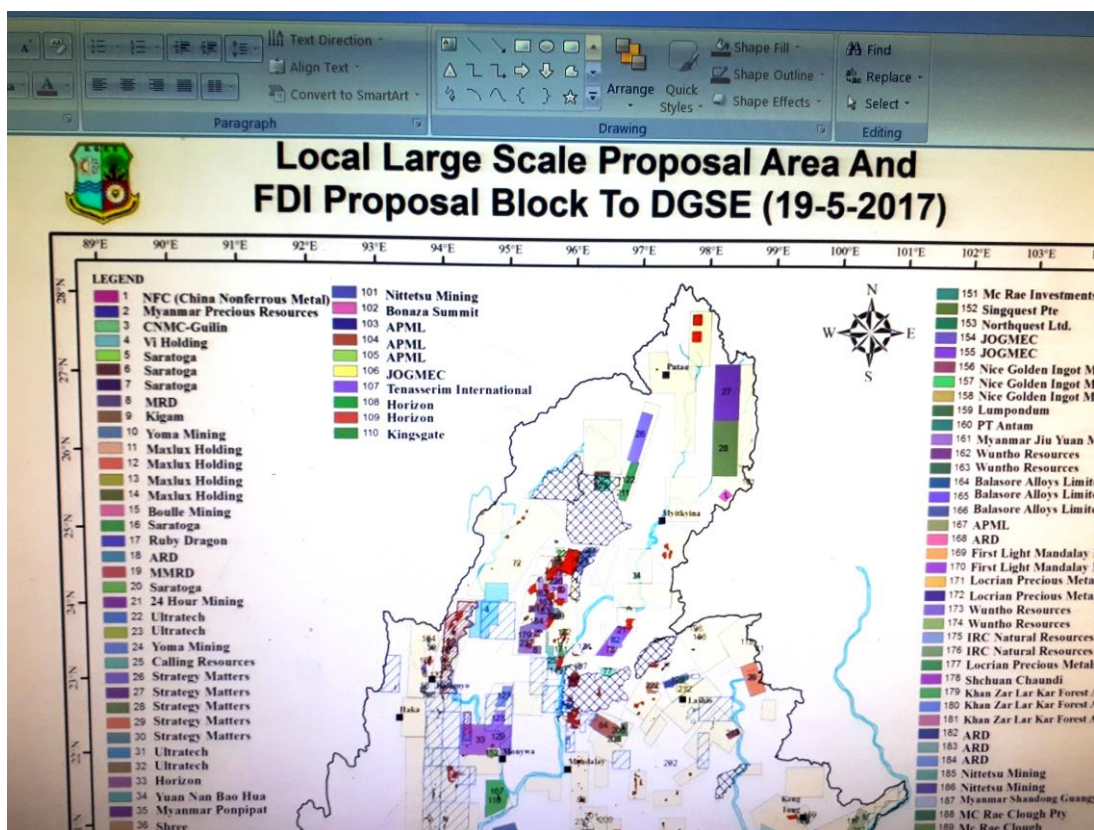


Figure 30

As consequence, it can be concluded that the digital cadastre information I not being properly updated and treated, and consequently the existing computer tools are insufficient and underexploited

## 9.2.- GEMSTONE PERMITS

In opposite to the situation of the standard minerals, the level of activity for exploration and mining of precious minerals (gems and jade) is very high, with more

than 15,000 permits, being the most of them owned by private titleholders (97,6 %, see Table VII).

License	Type	Number	%
Gemstone	Private	15,016	97.6
	Joint venture	364	2.4
<b>Total Gems</b>		<b>15,380</b>	<b>100.0</b>

Table VII

It must be reminded that practically the totality of all these permits are located inside the “tracts” reserved exclusively for this type of activity. Table VIII details the number of blocks handled by private or by Joint Ventures in each area, separating the blocks devoted to exploration and mining.

Area	Granted Blocks		Exploration Blocks		TOTAL	TOTAL JV	TOTAL PRIVATE
	JV	Private	JV	Private			
Lone Khin, Phar Kant	224	5,070	123	900	6,317	347	5,970
Nant Yar Sate		17		12	29	0	29
Khan Dee		2,058		75	2,133	0	2,133
Maw Luu, Maw Han (Moe Nhyin)		3,547		191	3,738	0	3,738
Moegok	10	1,808	5	953	2,776	15	2,761
Mine Shu	1	235	1	150	387	2	385
<b>TOTAL</b>	<b>235</b>	<b>12,735</b>	<b>129</b>	<b>2,281</b>	<b>15,380</b>	<b>364</b>	<b>15,016</b>

Table VIII

Area	Acres		Total acres	Total Km2
	Granted	Exploration		
Lone Khin, Phar Kant	13,743	5,881	19,624	79.4
Nant Yar Sate	17	12	29	0.1
Khan Dee	2,058	75	2,133	8.6
Maw Luu, Maw Han (Moe Nhyin)	3,547	191	3,738	15.1
Moegok	2,107	1,053	3,160	12.8
Mine Shu	253	168	421	1.7
<b>TOTAL</b>	<b>21,725</b>	<b>7,380</b>	<b>29,223</b>	<b>117.8</b>

Table IX

Table IX details the sizes of the areas devoted to mining and exploration. In the Consultant's opinion is highly significant that in spite of the enormous economic importance of this type of mining activity (in a recent report, Global Witness estimated that only the jade industry to be worth US\$31 billion in 2014) and in spite also of the high number of granted mineral rights, the area covered by the existing permits is really small. Is very illustrative to see that the total area covered by gemstone permits in the entire country is 117,8 Km<sup>2</sup> K, i.e. less than 25 % of the maximum area allowed for a single exploration permit (see Table I and V). In the consultant opinion there are two main reasons which generated this anomalous situation:

- The size of the granted areas, too small as it was analysed in chapter 7.
- The buffer area leaved between leaved between neighbour polygons to avoid overlapping (see Figure 24).

The combination of these two factors produces that the level of occupancy is extremely low and consequently the potential for gemstones is remaining underexplored.

### 9.3.- CONCLUSSIONS AND RECOMMENDATIONS

Table X shows the information corresponding to the whole of mineral rights existing presently in Myanmar, integrating the gemstone permits and the standard mineral licenses. The total number of permits (16,625) may give the impression that, consistently to the international standards, it is an intermediate scale cadastre, with a number of licenses adequate in relation to the size of the country.

License	Type	Number	%	% Total
Prospection		0	0,0	0,0
Exploration	Large scale	24	1,9	0,1
Exploration	Small scale	368	29,6	2,2
Mining	Large scale	153	12,3	0,9
Mining	Small scale	633	50,8	3,8
Mining	Subsistence	39	3,1	0,2
Mining	Feasibility	28	2,2	0,2
<b>Total Standard Minerals</b>		<b>1.245</b>	<b>100,0</b>	<b>7,5</b>
Gem	Private	15.016	97,6	90,3
	Joint venture	364	2,4	2,2
<b>Total Gems</b>		<b>15.380</b>	<b>100,0</b>	<b>92,5</b>
<b>TOTAL</b>		<b>16.625</b>		<b>100,0</b>

Table X

However, a detailed analysis of the percentages distribution for each type of license shows (by comparison with the international standards) extremely anomalous values:

- The number of licenses for large scale exploration of standard minerals is only the 0.1 % of the existing permits.
- The number of mining licenses for standard minerals is more than two times the number of exploration licenses. In addition, more than two thirds of the mining licenses correspond to small scale permits.
- The gemstones permits are nearly the 95 % of the licenses, but such extremely high percentage represents merely 118 km<sup>2</sup>, i.e. less than the 0.0002 % of the country.

This situation and these percentages are really unusual and very different by respect the standard values. The distribution of the different types of licenses evidenced a very anomalous situation of the licenses, with a great predominance of the small scale activities, a very low rate of exploration projects and minimum occupancy of the available territory. In the Consultant's opinion this situation is clearly related to the inadequacy of the present structure of the mineral rights (too short duration for exploration and too small size of the permits) and the lack of security of tenure of the present licensing procedures. The combination between these parameters creates a low attractiveness atmosphere for the development of the mining sector and gives rise to the present regrettable situation, where the Myanmar territory remains underexplored and the development of the mining sector is not proportional to the geologic and metallogenic potential.

In relation to the status of the cadastral data and documents, based on the previous statements and taking into consideration also the analysis realized in chapter 8, it can be concluded that the situation of the cadastral information is secured from the physical point of view, because the documents and the information are properly surveyed and maintained, and consequently there is no risk for losing or damaging documents. However, the methodology applied for coding and filing documents impedes the adequate, efficient and modern management and exploitation of the available information.

## **10.- ADDITIONAL COMMENTS**

As complementary information to the previous chapters, in order to access to a more complete vision of the Myanmar mining sector, the Consultant revised also other documents, directly or indirectly linked to the licensing activities. The comments arising from the revision of these documents are summarized below.

### **10.1.- COMPLEMENTARY DOCUMENTS**

#### ***10.1.1.- MEITI reconciliation report 2014-2015 (draft version 240118)***

- In several chapters of the report it is mentioned the obligation (for foreigners) to establish a joint venture to be granted with a mineral right. It should be clarified that such restriction is prescribed for the gemstones licenses, but not for the other minerals. However, in practical terms, such obligation is imposed due to the arbitrary interpretation of articles 83 and 84 in regulations (see chapter 8.2).
- In the recommendations, the report suggest as advisable to grant all the mineral rights by tender bids. However, as analysed in chapter 6.5, the countries who adopted such methodology as standard for the mining sector experienced strong difficulties and the impacts have been very negative. In mining sector, the dominant granting method should be first come, first served and only in exceptional cases, when the information about the available mineral resources are sufficient, the tender bid are applicable.

#### ***10.1.2.- Draft mining policy***

- Policy 1 (a) - Objectives. The role of the State should be preferably to promote and to incentive the mineral exploration, not to develop mineral exploration by itself.
- Policy 1 (b) – Work programs. It would be advisable to define, as an essential component of these work programs, a strategic plan for the Geology Department, in order to reorient its institutional responsibilities towards the present social demands. Basic concepts and ideas to be taken into consideration in this strategic plan have been included below in chapter 10.2.
- Policy 1 (b) – Work programs. The strategic plan mentioned above as well as the Work Programs in general should be accompanied by a clear and unambiguous policy for data diffusion.
- Policy 2 (b) – Work programs. It would be advisable to differentiate between exploration and mining activities because problematic and the required strategies are very different in each case.

- **Policy 3 (b) and Policy 8 (b) – Work programs.** The term online should be carefully treated. The online capacities to be implemented should be carefully evaluated in relation to the legal compatibility with the general legal system and the available technical infrastructure, taking into consideration their potential implications and risks in licensing activities. In general, there is no problem if submission of reports or documents and payments are executed electronically through the portal. However, before to implement the electronic submission of applications, where the priority of the application is engaged and where a total transparency is required, the electronic submission may imply some limitations on this respect. Furthermore, it should be also evaluated if in case of conflict and judicial reclamation in the court, the electronic files would be considered valid from the legal point of view.
- **Policy 4 (a and b) – Objectives and work programs.** The geological information to be acquired and the geo-data to be compiled (geological maps, Geo-physics, Geo-chemistry, etc.) should be at regional scale and not detailed data for exploration, consistently to the proposed strategic plan principles (see chapter 10.2).
- **Policy 11 (b) – Work programs.** In order to guarantee the stability and sustainability of the public mining institutions and the adequate management of the mining sector, revenues return for sustainability, it is essential that a part of the incomes generated by the mining activities come back to the mining sector Administration, providing the required funds for licensing, monitoring (field inspections) and maintenance of the geological infrastructure (geologic and metallogenic maps).

### ***10.1.3.- Relationships between cadastral information and ownership beneficiary***

The design and the conception of the cadastral database must facilitate the access, in a transparent way, to the information related to the ownership beneficiary as required by EITI concepts, including the shareholders names and their respective percentage of participation, as well as the total number of existing shares. In this respect, the database should detail (as minimum level of information) the following data for the companies holding mineral rights:

- Company name
- Type of company
- Country where the company was registered, including the registry number and registration data.
- Contact person and coordinates (address, phone, email, etc.)

- Number of shares.
- List des shareholders and respective percentage of participation.
- If it is the case, the database should list the mineral rights (different by respect to the titles held by the company) held by the shareholders themselves.

#### **10.1.4.- Natural resource Federalism, considerations for Myanmar (NRGI Myanmar Resource Briefing)**

In the Consultant's opinion, some of the concepts implicitly accepted in the NRGI analysis are not totally consistent to the best international experience for licensing and the reality of the mining sector. These discrepancies are commented below:

- **Chapter 3 (licensing).**- Along the text, there is a mixing between exploration and mining, as if they were identical activities that can be treated uniformly in the same way, without differentiation in their respective problematic and characteristics, mentioning both together as "granting mineral rights" or talking always about "extraction" without any mention to the pre- required exploration activities. Before to grant a title for mining it is necessary to discover the resources and consequently, an exploration rights should be granted the corresponding exploration project must be executed. Consequently, the awarding licenses cannot be simply "*a two-step process: first, a government decides whether to allow extraction in a particular location, and second, it decides which companies receive the right to operate there. In theory, the decision to extract should precede the negotiation of an individual license though in practice the two are often part of the same process*". Before that, the government must decide the areas where the exploration is not restricted (natural parks, security areas, protected forest, etc.) and to incentive the exploration activities within the authorized zones, granting exploration rights based on the principle first come, first served and filtering the adequate holders by eligibility criteria. Later, when the resource has been discovered, the State must guarantee that the exploration titleholder who fulfilled obligations during exploration phase will have access to the mineral right under standard predefined conditions, without negotiations. International experience shows that negotiations imply normally potential discretion, subjectivity and corruption.
- **Chapter 4 (Cadastre and land management).**- The same the lack of differentiation between exploration and exploitation (or mining) described above is also implicit in the text of chapter 4.



- “When governments allocate licenses for **extractive** activity, they need to understand and respond to competing claims for ownership and use of surface and subsurface resources....extractive activity risks leading to violations of the rights of formal or informal titleholders, disruptions to agriculture and forestry, and encroachments on environmentally sensitive protected areas”. Exploration activities cannot be considered as extractive and they are not producing any disruption in land use. The large majority of granted licenses in the country (excepting the gemstone licenses inside the tracks) should correspond to exploration licenses, and as detailed in chapter 8, one of the main problems presently existing in the Myanmar mining sector is the lack of different licensing procedures for exploration and mining, making obligatory unnecessary verifications for land use, not really required for exploration.

Is for this reason that internationally, in the most of the country, there is not required the verification of the land-use (excepting the restricted areas) as preliminary step to grant an exploration license.

## 10.2.- CONCEPTUAL BASIS FOR A GEOLOGICAL SURVEY STRATEGIC PLAN

Geological Services belong to the most traditional public institutions and have been established in many countries of the world decades ago, sometimes more than a century ago. In all cases, they have been created to provide the geological knowledge needed to support the countries’ economic development, with respect to infrastructure, natural resources and more particularly, to their mineral industry.

While part of the overall and general mandate of national Geological Services remains valid, there have been a number of significant changes during the last decades which are affecting the role and functions of today’s Geological Services. To be successful, Geological Services cannot anymore be driven by traditional activities but by the present and potential needs of users and the incorporation of appropriate modern technology.

The role of Geological Services is being re-assessed, particularly in the context of worldwide reforms of overall economic and development policies and of the changing role of the State. Governments ask themselves such questions as: are the products or services delivered by Geological Services relevant to country development or society changing needs? Are the Geological Services products public goods or can be more efficiently and better provided by the private sector? As a consequence, many Geological Services have been asked to redefine their mandates.

These changes are not isolated and they are integrated in the evolution of the role of the State that in many cases moved during the recent decades from intervention positions towards free market economies. To be responsive to these changes, public

institutions have to change their mandates and roles, including the mining institutions, to effectively administrate the regulatory framework and to provide public goods to support the implementation of the government's new policies and fulfilment of its new responsibilities. In the market economy investments in productive activities – such as mining exploitation which do not correspond to public goods are the responsibility of the private sector.

In the case of the Geological Services, which often used to be the mineral exploration arm of the Government, the role of the State is now confined to the initial low-cost (small investment per square kilometre) and low-risk activities of the mining development sequence. Such activities aim at gathering basic geologic information to provide the required infrastructure and knowledge of the geological structure of the country, helping (among others) the promotion of the investments in the mining sector and leaving the high risk, high cost activities to the private sector. The correlation between knowledge and development is well known and the role of Geological Services within this context, as one of the institutions committed to the development of national economies, is important. Readily available and reliable geo-information is vital for governments and to society not only for the mining sector, but also for civil works infrastructure, environmental protection, geo-hazards risk assessment, and others.

In addition to the changes in the institutional functions of the State and the Geological Services, it must be also taken into consideration the evolution of technology which is affecting these institutions far beyond the mere introduction of modern tools. The user's community of the geological information is changing and increasingly using IT tools such as Geographic Information Systems (GIS) and remote sensing (RS). As consequence, there is a different data demand beyond the traditional products such as format rigid hard copy maps and reports.

The traditional mandate of the Geological Services “*as a provider to the Nation of reliable, impartial information to describe and understand the Earth...*”<sup>8</sup> is still valid. However, changes in economic policy and information technology mentioned above are affecting the more detailed content of such a statement. Geological Services have to evolve from a “supply” driven set of activities, the content of which is usually defined by the Geological Services staff -, to a “demand” driven one - e.g. the timely provision of different types of thematic information and on varying and flexible types of format or support, depending on the demand of the users. In addition, the use of geo-information is today increasingly expanding beyond the traditional sectors, for example agriculture development, water and environmental management or geology-related health problems.

Based on such recent evolution, the challenge today for Geological Services is to development a consistent, cost effective nation-wide earth sciences data and

<sup>8</sup> From USA Geological Survey mission statement.

knowledge infrastructure, but not limited to a simple information repository, because Geological Services:

- Must evolve from a mono-disciplinary, inventory building set of activities to a multi-disciplinary, oriented to provide solutions to the society demands.
- Must develop the institutional capabilities required to ensure that can effectively contribute to society in a sustainable way, being pro-active to interact with society and users, including government.

The difficulties of the required changes should not be underestimated and needs a long-term commitment and it requires a clear focus on the objectives and time enough to absorb the changes. For this reason, the design of a strategic plan determining these objectives, fixing the priorities and establishing the logic implementation sequence is essential to optimize the use of the available resources and to avoid the dispersion of efforts.

## **11.- PRELIMINARY IDEAS ABOUT THE ROADMAP TOWARDS THE NEW COMPUTERIZED CADASTRE**

The preliminary ideas exposed below (to be revised and refined after the third and last mission) are based on the analysis and findings presented in the previous chapters, which identified the technical, legal, organizational and procedure deficiencies of the present mineral licensing system, concluding that there is no doubt about the urgent need for overhaul and modernization of the system. However, the question is: how to proceed to implement the required reforms and to implement a new computerized cadastre? International experience gained in other countries during the last decades shows that success is very dependent on the implementation sequence.

### **11.1- THE INTERNATIONAL EXPERIENCE**

Quite often, the Administrations responsible for the management of the mining sector have the impression that solutions for licensing problems may be afforded by implementation of computer tools. However, practical experience demonstrated that, although computers are powerful and useful tools and its utilization is mandatory, they cannot by themselves provide the required solutions, because the existing defaults in institutional organization, legal framework and licensing procedures cannot be corrected merely with computing.

In addition, it has been also verified that all the existing problems cannot be solved simultaneously and as precondition it is required to respect an implementation sequence. If the final objective is to implement a decentralized computer cadastre, where regional offices are habilitated to receive applications and to grant certain type of permits, such decentralization cannot be implemented if certain previous conditions are not sequentially fulfilled, as detailed below (see Figure 31):

1. A computerized decentralized cadastre should be based on a previously established, tested and operational computerized centralized cadastre, and requires the adequate technical communication tools (i.e., internet access).
2. A computerized centralized cadastre should be based on a well-organized and established paper cadastre (registry book, adequate coding and filing methodology, no conflicts and overlaps, etc.).
3. A good paper cadastre needs to be based on good cadastral procedures (clear, simple, objective, direct, nondiscretionary, etc.).
4. Cadastral procedures should be based on appropriate cadastral regulations, building upon the principles and guidelines instituted in the minerals law.

5. Essential and core principles should be established unambiguously in the minerals law, determining the criteria for granting, maintaining, renewing, or cancelling licenses. Complementarily, the legal framework should be supported by an adequate institutional organization and an accurate geodesic and topographic basis.

Additionally, in some cases (depending on the situation of the country) it is also required the cleaning-up and reorganization of cadastral information, including updating of codification and filing methodology, and these activities are normally called “pre-cadastre”. In the most of the cases, the execution of the “pre-cadastre” phase require the closing of the cadastre for reception of new applications (moratorium) and cadastre should be not open again until the complete reorganization of the cadastre files.

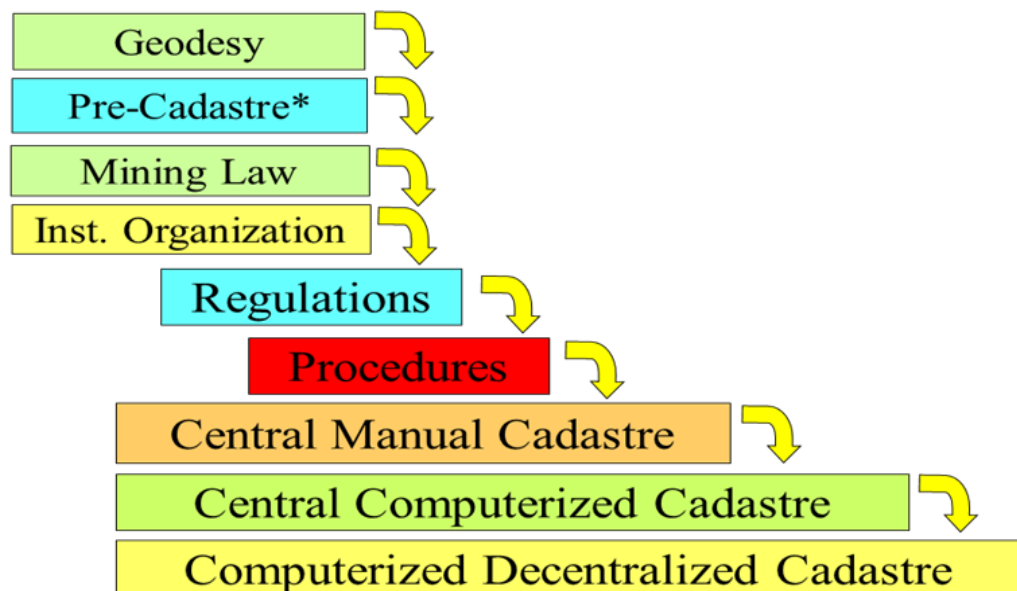


Figure 31

Unfortunately, there are several recent examples of countries that tried to proceed directly to computerization, without any legal reform or without the previous pre-cadastre phase, and the results are very illustrative. In all these cases, the impact of the computerized system on the management of mineral rights has been nil, and often the system collapsed leading to long moratoria on licensing, being the main troubles caused by:

- The inadequate planning of the pre-cadastre activities, developed simultaneously with computerization, generated difficulties and development was slow and inefficient, creating a never-ending backlog and unlimited delays, as well as errors in codification, filing and databases.

- After the moratorium, the cadastre was opened before the pre-cadastre activities were complete, before the approval of new Regulations and consequently before the design of new licensing procedures.

On the other side, the experience of the countries that have not taken the required precautions before decentralization could be also very illustrative for Myanmar who has already two decentralized regional offices. Probably, the Indonesian mining sector reform is the best example of the particular challenges that decentralization poses. Indonesia is made up of several hundreds of islands and is one of the countries in the world where the need for decentralization are the highest. During the 1980s and 1990s, Indonesia was the most successful country in Asia in terms of attracting foreign investment, and developing a world-class mining sector.

Simultaneously with this evolution, the country implemented an efficient computerized cadastre, which was one of the more advanced in the world when it was introduced in the late 1990s. Due to the particular political decisions adopted in 2001 and 2002, cadastre management was decentralized and mineral rights licensing responsibilities were transferred to the districts, introducing a certain level of regional coordination. Decentralization, however, is extremely risky because of the potential conflicts, duplications and overlaps it can produce if a number of preventive measures (both administrative and computing) are not taken. Almost none of these precautions were taken into consideration before the decentralization of the Indonesian cadastre, leading to a number of problems, including:

- Lack of coordination in the implementation of the legal framework and cadastral procedures, which varied from one office to another;
- Lack of homogeneity and coordination about the codification system, which differs from one office to another, making simultaneous and consistent processing of all cadastral data for the whole country, or even for a single province, impossible;
- Lack of homogeneity and compatibility of computerized systems;
- Lack of tools, protocols and procedures for systematic and periodic data exchange between the local and central administration;
- Utilization of local coordinates in some cases, making integration with the other licenses in a GIS impossible; and
- Very low security of the cadastral information, with a high risk for unauthorized alteration of licenses or violations of the application priority system. This insecurity affects both the paper files (due to the lack of signed registry books) and also the digital files.

The direct consequence of these reforms (see also chapter 6.4 and Figure 19) was a reduction in security of tenure, because overlaps between applications and previously granted licenses could not be avoided. Also, potential investors perceived that the principle of first come-first served would be violated. As mining investors lost confidence, the number of titles plummeted.

## 11.2.- THE APPROACH REQUIRED IN MYANMAR

The situation of the licensing activities and the cadastral information in Myanmar requires urgent changes in several essential components affecting the application and granting of the mineral rights, as they are:

- a) To provide an accurate and reliable cartographic basis. This work is convergent with the on-going ONEMAP project.
- b) To integrate the cadastral information in a depurated and unified database (pre-cadastre). This work is convergent with the on-going NRGi project.
- c) To improve the institutional organization, creating a specific unit named “cadastre”.
- d) To develop and to implement new licensing procedures, followed by its computerization.

However, the required changes cannot be implemented simultaneously and taking into consideration the particular situation of Myanmar and the present circumstances of the different departments participating in licensing activities, it is recommended to implement a progressive and sequential approach. However, the final design of the implementation sequence as well as the required implementation strategy will be conditioned by the level of commitment at political level to adopt the proposed changes. Obviously, the final cadastre design and new procedures cannot be the same if the new Cadastre department is created or no. However, during the present mission it has been stated the favourable position at uppermost level in MONREC in relation to the creation of this cadastre unit and based on this agreement the following short term activities have been proposed:

- a) To accelerate the access to an accurate and reliable cartographic basis, following the technical statements and the activities detailed in chapter 3, in cooperation with the Survey Department.
- b) To initiate immediately the Pre – Cadastre activities, following the strategy detailed below in chapter 11.3.

### 11.3.- PRE – CADASTRE ACTION PLAN

#### 11.3.1. Objectives. Technical description.

The objective of the pre – cadastre is to create a complete and “clean” database where it should be properly loaded and codified all the existing mineral rights, as well as the pending applications (i.e. submitted and registered applications which are still in the licensing circuit for granting or refusal and where the final decision is still pending). For this purpose, the objectives and activities to be developed are the following:

- Alpha-numeric database, to be stored in Access or similar software, and where the following information fields should be registered:
  - Registry number
  - Code (Permit number)
  - Identifier (new code). Initially this field of information will be empty and it will be filled at the end, when the database will be complete. The new code will be assigned by chronologic order using the application date information.
  - Type of license
  - Holder or applicant
  - Mineral
  - Application date
  - Granting date
  - Granted period (years)
  - Expiration date
  - Status (in validity, pending, renewed)
  - Region or State
  - Sub-Region
  - Topographic sheet number
  - Conflicts or problems



▪ Comments

Obviously, for the pending applications, some of these information fields will be empty.

Coordinates data base. The coordinates of each polygon will be registered in a single and independent file (Excel or similar), where the name of the file will correspond to the identifier (code) of the license. The corners coordinates will be introduced following clockwise order as indicated in Figure 32.

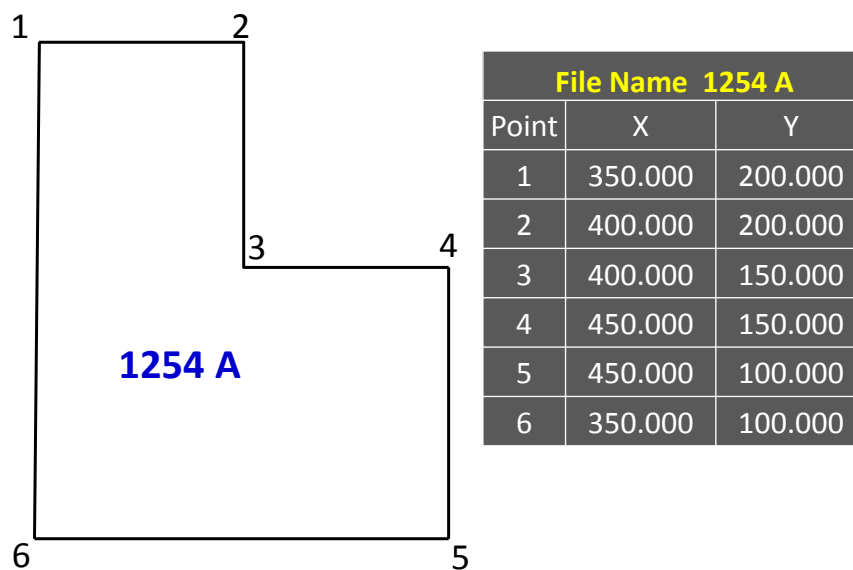


Figure 32

Graphic data base, to be stored in Arc Map, Map Info or other similar GIS software, where it will be plotted the polygons corresponding to each one of the existing granted licenses or pending applications. Each one of these polygons should be a differentiated and single entity in the graphic database, identified by the present license code.

In addition, the GIS will store in separated layers of information the areas reserved for gemstones (Tracks) as well as the zones where the mining activity is restricted (Natural Parks, Reserve Areas, Protected Forest, Security zones, etc.).

Linking between alphanumeric and graphic information in the GIS. Linkage will be realized using as single and unique identifier the present license code.

- Verification in the GIS and database of potential conflicts or cadastral problems (overlapping, duplications, etc.). Evaluation case by case and proposal of solutions.

### ***11.3.2.- Pre-cadastre team. Required profiles and skills***

Based on the practical experiences in other countries, the more operational methodology to prepare the databases and to develop the activities described above is to create a working group, selecting the adequate members among the agents presently engaged in licensing activities. In the case of Myanmar, taking into consideration the institutional organization where the licensing is being developed, to create this working group it would be advisable to select two agents from each one of the departments more actives in licensing (GSED, DOM and GED). These agents should be released of all the present responsibilities and duties and be devoted exclusively to the pre-cadastre activities.

As basic and unavoidable background, the selected agents must be experienced in licensing activities, having a deep knowledge of the present procedures. In addition, at least one of them must have knowledge or capacity in the following skills:

- Database software.
- GIS software.
- Topography or surveying, including use of GPS.
- Analysis of legal and regulatory texts

Complementarily, it would be advisable to have the support of an external expert, hired in Myanmar or in the region, having a minimum experience of 5 years in design and configuration of computerized applications based on PC platforms with data base applications integrated with of data banks and geographical information system (GIS) applications related to the integrated treatment of alphanumeric and graphic data for mining or earth's sciences in a GIS. The presence full time of this expert is not required, but he must visit periodically the local working group.

### ***11.3.3.- Strategy for implementation***

In order to facilitate the activities of the pre-cadastre working group, it will be habilitated a working space (pre – cadastre office) where they will have access to the required office tools (furniture, boards, copy machine, etc.) and computers linked by a local network, internet access and printer. If feasible, the system must be configured

as multi-user, allowing all the users to access to the same file, in order to avoid the duplications and gaps usually appearing when separate files are being used.

It will be required within this working space a copy of the essential licensing documents for each title or pending application, as for instance the application form, granting letter, etc. The technical reports are not required in this initial phase, excepting in the case where some conflict should be solved. In the meantime that the digital database is being registered, it will be built in parallel a pre-cadastre archive, where the essential documents will be classified, re-codified and filled. The activity of the pre-cadastre working group will be developed in two steps:

- Phase 1, focused in all the licenses or pending applications for standard minerals and gemstone existing outside the gems tracks. This phase will permit to obtain a detailed idea on the cadastral situation on the entire surface of Myanmar and to identify the open areas and the existing conflicts affecting the potential exploration areas.
- Phase 2, focused on the gemstone licenses and pending applications inside the tracks. It would be advisable, in order to avoid duplications and to make shorter the creation of the database, to harmonize this activity with the work presently being developed by NRG I on this respect.

The development of the pre-cadastre activities will be profited as “training on the work” and, as well as the proposed reorganization of MONREC will be achieved and the new Cadastre department will be created, the pre-cadastre team will be assigned to the new department, and the licensing responsibilities presently under responsibility of GSED, DOM, GED, Mineral I and Mineral II departments will be transferred to the new cadastre department.

# ANNEX I

## VISITED AGENCIES AND OFFICIALS

### PARLIAMENT

- U Soe Thura Tun, Chairman, Committee for Resources and Environmental Conservation.
- U Kyaw Thiha, Chairperson, Committee for Resources and Environmental Conservation, Upper House.
- Sa. Khin Zaw Linn, Secretary, Committee for Resources and Environmental Conservation, Upper House.

### MPF

- Khin Khin Lwin, Director, MPF
- Sun Win, Deputy Director, MPF

### MONREC

#### Department of Geological Survey and Mineral Exploration

- Ye Myint Swe, Director General
- U Kyaw Din, Deputy Director General
- Toe Aung Kyaw, Director
- Toe Aung Kyaw, Specialist
- Myint Soe, Director
- Zaw Lin Aung, Director
- Kyi Shein, Deputy Director
- Tun Tun Oo, Deputy Director
- Athar Hlaing, Deputy Director
- Aung Naing Oo, Assistant Director
- Zaw Min Lwin, Assistant Geologist

#### Department of Mines

- Khin Latt Gyi, Director General
- Kyaw Thet, Deputy Director General
- Ahnt Soe Yin, Deputy Director
- AungMyat Thu, Deputy Director, Mining Enterprise No 1
- Aye Min Tan, Geologist, Mining Enterprise No 1
- Zaw Myint Oo, Geologist, Mining Enterprise No 2
- Kyaw Zaw Htun, Assistant Geologist
- Hla Win, Head of Account Office, Mining Enterprise No 1
- Daw Ngo Ngo Lai, Account Officer, Mining Enterprise No 2

**Department of Mines (Mandalay Regional Office)**

- Soe Aung, Deputy Director
- Sitt Sane, Mining Engineer

**Myanmar Gems Enterprise**

- Ye Htut, Director (Nay Pyi Taw)
- Myo Naing, Director (Yangon)
- Than Zaw Oo, Deputy Director, Emporium
- Thet Khaing, Deputy Director, Licensing
- Min Kyi, Deputy Director, Emporium (Nay Pyi Taw)
- Min Thu, Deputy Director, Commerce (Jade)
- Khun Htay Kyaw, Deputy Director, Management
- Htate Tin Naing, Deputy Director Budget and Audit
- Thein Soe, Assistant Deputy Director Licensing
- Tin Yu, Assistant Deputy Director Licensing
- Aung Myint, Assistant Deputy Director, Commerce (Jade)

**Myanmar Gems Enterprise (Mongok sub-region office)**

- That Zaw Oo, Deputy General Manager
- Ko Ko Win Myint, Assistant General Manager

**Survey Department**

- U Than Hlaing, Director General
- Thet Oo, Deputy Director General
- Aung Moe, Director Geodetic & Survey Division
- Thant Sin Oo, Deputy Director
- Htay Hlaing, Deputy Director
- Mg Mg Latt, Assistant Director

**Forest Department**

- Myat Su Mon, Assistant Director RS & GIS Section

**MYANMAR EITI**

- Aung Khine, Deputy National Coordinator
- Kyaw Thet, Deputy Director General, Department of Mining
- Shwe Win, Alternate, Myanmar Gems Enterprise
- Saw Mi Bway, Doh Tun, CSO (MATA)
- Naing Lynn Htut, CSO (MATA)

- Aung Kyaw Hlaing, Private Company Representative
- Khin Maung Han, Private Company Representative
- Htoo Aung, Observer, MATA
- Khin Pa Pa Khaing, Assistant Director, MPF
- Shwe Yi Win, Staff Officer, MPF
- Shona Kirkwood, Consultant, World Bank
- Tinzar Tun, National Consultant, World Bank
- Soe Win, National Coordinator, NCS
- Aung Khine, Deputy National Coordinator, NCS
- Tun Paw Oo, Technical Specialist, NCS
- Kyaw Nyunt Maung, Technical Coordinator, NCS
- Pyay Thar Kyaw, IT & Outreach Officer, NCS
- Thinn Yadanar Su, Communication Manager, NCS
- Aye Chan Wai, Communication Assistant, NCS
- Kyaw Thinn Maung, Program Assistant, NCS
- Soe Thiha Naing, Admin Officer, NCS
- Khin Saw Htay, NRG
- Hosana, NRG
- May Mya Thet, NRG

#### **NRGI**

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- Hosana Chay, Myanmar Associate
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## ANNEX II



## CONSULTED DOCUMENTS

- **Adam Smith International.**- Institutional and Regulatory Assessment of Regulatory Industries in Myanmar
- **Artieda, J.**- Baseline report on Mineral Cadastre in Myanmar.
- **Artieda, J.**- Mining Cadastre Myanmar EITI Support
- **Artieda, J.**- Artieda Proposed Methodology and Roadmap for Cadaster Development.
- **Chorn Nak** - Assessment of Myanmar - Mineral Cadastre Management and Data Quality.
- **MCRB.**- Myanmar Mining Sector Wide Impact Assessment (Limestone, Gold and Tin).
- **MEITI reconciliation report 2014 - 2015 (draft)**
- **NRGI.**- Myanmar Resource Briefing. Natural resource Federalism (considerations for Myanmar).