Using Management of Technologies to Avoid Social Conflicts around the Area of Large Scale Mining Project in Madagascar

Herindrainy Olivier Rakotomalala, Elisé Raveloson, Andrianaivomalala Ravalison, Etienne Rakotomaria
University of Antananarivo, Madagascar

Abstract--The emergence of large scale mining projects is a lever for economic growth for a country ranked among the poorest in the world as Madagascar. The Government supported by donors like the World Bank has taken steps to encourage the investors in this regard. But local communities in the area of implementation of the project can be a barrier delaying or even halting the project. This paper aims to study the interactions between a large scale mining project and its host environment to better understand the dynamics of this system and find ways to anticipate its future. The mathematical theory of graph was used to model the relational transactions between elements of the system formed by the project and its host community. Then we wrote algorithms and queries on visual basic and pyton to implement the model on a computer system. We found that this software can be a ground surveillance system for the mining company to anticipate possible social conflicts and adjust the action to be taken in time to avoid it.

I. INTRODUCTION

The considerable growth in global demand for certain minerals from the late twentieth century led to the proliferation of large mining projects. This situation has been exacerbated in recent decades to support the major economic growth in emerging countries. At the same time, firms that want to create new large scale mining operations with the significant environmental impact, may increasingly to face a determined opposition of local people supported by environmental NGOs. Cohabitation between the project and its host environment is often marked by conflicts series. In the specific case of Madagascar, many hopes were worn on the emergence of major mining projects to revive economic activity and get the country out of poverty. Two major mining projects operating globally have been realized in recent years: The exploitation of ilmenite in Fort Dauphin by Rio Tinto and Nickel and Cobalt in Moramanga by Sherrit with the large treatment plant in Toamasina. Jobs have been created, public infrastructure has been built or renovated within the framework of these projects. But we observes manifestation of discontent against big mining projects both in local communities and at the level of the national deciders: Barriers erected to prevent the activities of Companies, strike to denounce the method of recruitment , use of the term disadvantage of the Malagasy part in the operation of large mines to revive political tensions. Other large scale mining projects are now in its development phase. But local communities in the area of implementation of the project can be a barrier delaying or even halting the project. This paper aims to study the interactions between a large scale mining project and its host environment to better understand the dynamics of this system and find ways to anticipate its future.

For this paper, we have taken a coal mining project at Sakoa locate at the southern part of Madagascar as a case study.

II. METHODOLOGY

A. Method for relational transaction modeling

1. General

How to understand and make sense of the real world that is both complex and multidimensional? Among these dimensions, at least three together contribute to an understanding and some uncovered phenomena that compose it. These dimensions or sets or spaces are the space of the observable reality (thematic, semantic), spatial or geographical space, the temporal space, spaces in which register the phenomena involved in the construction of all or a part of the real world based on a problem or a given application.

Data modeling, leading to the establishment of a conceptual model, requires the use of well-defined concepts and formalism not only for the representation and mapping the real world, but also offering a tool sparking discussion and dialog between users.

To express and communicate the internal structure of the phenomena as well as links between and inside thereof, a modeling is to perform. Among the methods proposed to address spatial phenomena, those hyper graphic inspiration and set-emerging as the most effective. They can represent as graphs and hypergraphs, classes and superclasses, links and hyperlinks to the internal structure of simple phenomena. Simple phenomena them will contribute a part in understanding complex phenomena expressing a part of the real world looked the other to achieve a conceptual data model. For this study we have used the HBDS method.

2. Method HBDS

HBDS or **H**yper**G**raph **B**ased **D**ata **S**tructure) is a method of data modeling on the hypergraph theory. It was the subject of the doctoral thesis (Specialty: Mathematics, Option: Information Technology) of Professor Bouille in 1977 entitled "A universal model database simultaneously portable, distributed". The method allows to develop hypergraphique class diagrams from which is built on logic and physical model. This method allows to structure any phenomenon. It is based on mathematical foundation: set theory, graph theory (including multigraphs and hypergraphs), category theory, ...

3. Fundamentals of HBDS method

This method has the following three basic elements: class, attribute and link. A class is a group of elements called objects. It is represented by an ellipse with one focus symbolizes an object of the class. The objects of this class are characterized by attributes, represented by squares connected by a line to the home. The objects of a class can be related to objects of the same class or other classes with the concept of "relationship between classes." A link between classes is potential (it may not be performed for some objects) and is represented by an arrow between the foci of the two classes involved. The inverse relationship is implied.
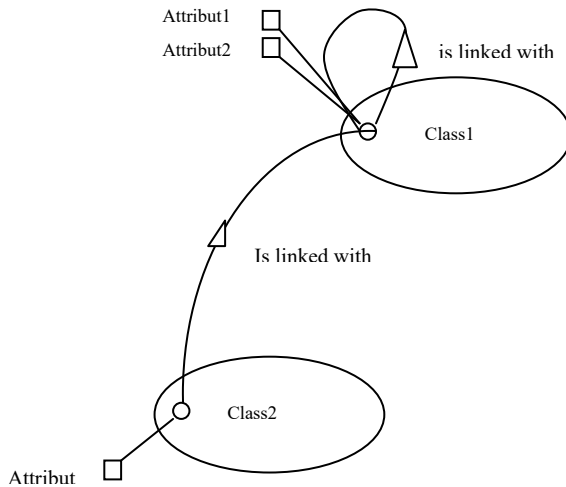
Attribut1
Attribut2
is linked with
Class1
Is linked with
Class2
Attribut

Fig.1: Lfundamentals of HBDS Method

There are six Abstract Data Type in the HBDS method:
- A class is a set
- A class attribute is a property of this set
- A link between classes is a potential relationship between these sets
- An object is an item belonging to a set
- An object attribute is the value that takes the class attribute for that particular object
- A link between objects is the actual verification of the potential relationship of two objects

The last three are generally not shown in the drawing.
These abstract data type constitute the skeleton of the structure

B. Method for ground surveillance

Given the complexity of the real world as part of a mining project that interacts with its host environment, we propose in this study the use of information system technologies attempt to model and map the interactions between different entities of the system. A Relational Database Management System (RDBMS) will be established for semantic information management. It will be coupled with a Geographic Information System (GIS) for managing spatial information. We will write programs to be able to cross different queries

and questions to integrate into a single system all types of information analyze and interpret interactions, then draw conclusions to help decision making, the purpose is to anticipate or avoid conflicts or to identify the likely sources of a problem. The works to be done are:
- We will use the HBDS method to model the real world and get a Conceptual Model of Communication and Conceptual Model of Records.
- This model will then be translated into Data Logic Model (DLM): Work to do at this point are to describe the data structure used without referring to a programming language. It is therefore necessary to specify the type of data used during treatments. Thus, each entity of the conceptual model class becomes a table in the logic model. The identifiers of the entity class are called key of the table, while the standard attributes become attributes of the table, that is to say of the columns. The passage of the conceptual model to logical model at the relationship of classes is done according cardinality entity classes participating in the relationship:

• if a feature classes has low cardinality:
the table will have as attributes, the attributes of the class with low cardinality, then it (or them) attribute (s) relationship and finally the attributes of the second class preceded by the name of the class
• if both feature classes have high cardinality:
the table will have as attributes, the attributes of the two classes of relationship names preceded respective classes, then it (or them) attribute (s) of relation
- The physical data model is obtained by implementing the LDM in the computer system. This is actually a formalism used to specify the employee storage system. In this thesis, we used the Microsoft Access DBMS software and ArcGIS GIS software for the management of the information system used as a monitoring system. The portion of the model information of the Physical Model Logical Data requires tables hitherto are external to the database files are translated into an integral part of the database. So
   - The tables described in the logic diagram become data files called "tables";
   - Properties become table fields;
   - Identifiers become primary keys
   - Inherited keys become secondary keys
   - Programs will then be developed to enable the implementation of various features of the monitoring system thus formed. The system should collect all information about the coexistence of the mining project and its host community, analyzed through different requests in order to anticipate possible threats or seize possible opportunities in advance the preservation of social peace without which no sustainable development can occur.

III. RESULTS

A. HBDS model relational transactions between entities
1. Definition of classes

We have have taken the Coal project running by the company Pan African Mining Corp through its Malagasy subsidiary called PAM Sakoa Coal SA. Before entering to the definition of classes , we want to give you a brief description of the company. Pan African Mining Corp is a Canadian based company registered in Vancouver, British Columbia. Its operations in Madagascar are carried out through its operating subsidiary PAM Madagascar SA, PAM Sakoa Coal SA and its uranium activities through its 80% owned subsidiary PAM Atomique SA, under its Joint Venture with l'Office des Mines Nationales et des Industries Stratégiques (OMNIS), a Malagasy State Agency.At the beginning, in 2003, it was an exploratory resource company with approximately 7,500 squares kilometers of diversified mineral properties in Madagascar, the fourth largest island on earth located in the south east coast of Africa. It was listed at the Toronto stock exchange under the symbol PAF. In 2008, this company was taken over by a Thai Company called Asia Thai Mining and they transformed it into private company. But they kept the head office in Vancouver. So it stays as Canadian company but owned 100% by Thai Company. The new owner of the company set up a new strategy: They wanted to speed up the coal exploration and develop the project to generate cash flow and use this to develop the others projects like gold and uranium. So all the machines and equipment like drill rigs and so on were moved to the coal project. Most of the human resources composed of more than 150 people were moved also to the coal project. The Project was developed very fast but social problems started to be the daily bread for the management. It was one of my big responsibilities as the Public Relation Director of the company to try to handle this issue. We have tried to understand first the source of the problem and we realized that it is a complex system and needed more thoughts to well understand what is happening in order to anticipate and if possible avoid the problem. This is why we carried out this research.

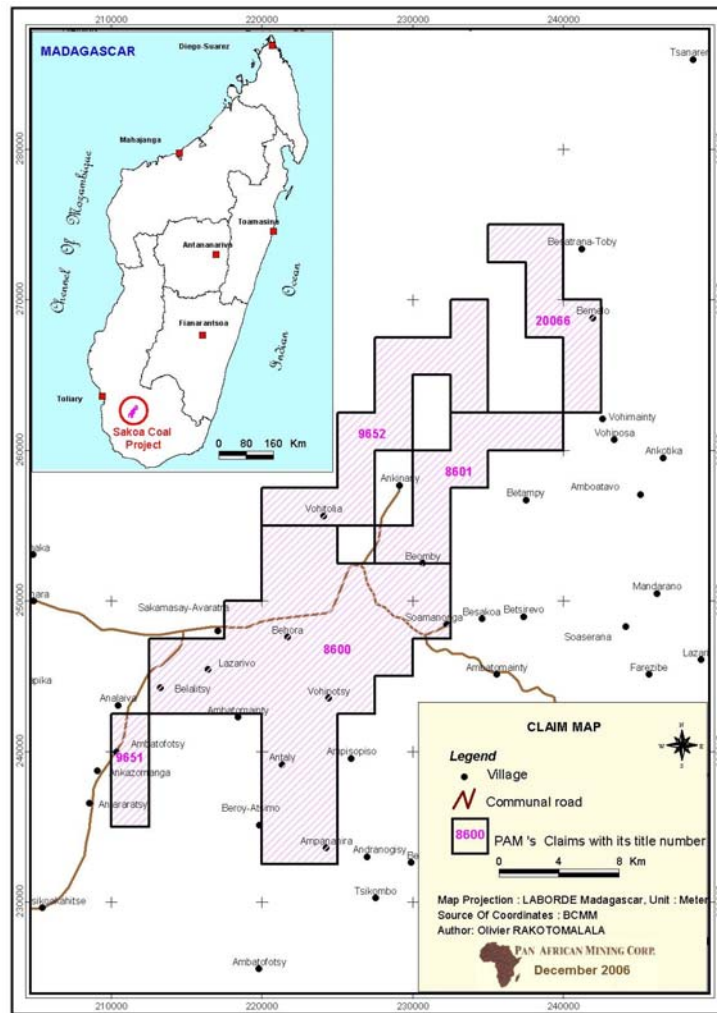The coal project is located at the southern part of Madagascar (Fig2).

Fig.2: Pam Sakoa Coal SA Project Location

The coal concession of this company covered 400 squares kilometers of land and cross to 5 rural and remote Communes. Many elements are in interactions at the exploration site Sakoa coal. The objective is the development of a tool to identify the most relevant sources of information, store and analyze to anticipate potential conflicts within the complex system formed by the mining project and its local host. We chose the limits of the host environment at Commune level. That is to say, the administrative level from the District is no longer considered part of the system. We identified thirteen classes.

► Class1: Technical Project Team

This class represents the technical staff working in the field of mining company for work directly related to mining exploration. These are geologists, drillers, engineers mining and geotechnical engineers, the people in charge of the environmental aspect, surveyors and specialists in database. Technical staff has a name, service number, sex, nationality and function.

► Class 2: Administrative Project Team

It includes the site based administrative staff. Among these are the staff of the Human Resources department at the site of personal finance and accounting department, personnel for maintenance and operation of the camp, the staff of the public relations department. An administrative staff have a name, service number, sex, nationality and function.

► Class 3: Expatriates

This class represents expatriate experts who supervise or provide technical support to the project team. An expatriate has a name, service number, sex, nationality and function.

► Class 4: Project drivers

We have chosen to give a class of its own drivers and drivers of vehicles project because we noticed they are present in all project teams movements and therefore their place is important in the search for information and collections data. A driver has a name, service number, sex, nationality and function

► Class 5 machines and vehicles

These are the vehicles and machines of the Company. They pass through an area may be causing a conflict. Rolling stock has a registration number, type and owner. Indeed, one often uses service providers or equipment rental for the implementation of various works. That's why we put the "owner" attribute for the material.

► Class 6: Fields

This class represents the fields of crop or pasture for livestock. Has a field parcel number, consistency, capacity, contact information and an owner.

► Class 7: Cultural Sites

Are grouped in this class all sites that local people believe to be sacred places like the tomb (Fig 4),), tsangam-bato (Fig 3) worship. These sites are numerous in the project area and its location may be confused with a place concerned with research. A cultural site has coordinates, type and owner.

► Class 8: Local Man

This class represents the local populations male. A man has a name, an identity number and address.

► Class 9: Local Woman

We chose to devote a separate class for women because their relational transactions at the project environment can be the source of conflict situations. A woman has a name, an identity number and address.

► Class 10: Traditional chief

Traditional leaders play a very important role in rural communities in the project area. They are highly respected and they are actually their guidelines that are followed by local people. They are very important regarding the objective of this paper concerning social conflict prevention devices. A traditional chief has a name, an identity number and address.

Fig.3: Tsangambato

Fig.4: TOMB

In each village there are several clans and each clan has its leader called "Olobe or lonaka". The "Olobe" traditional leaders are often the elder in the village and they are the chairman all the great events of social life. The Olobe play a very important role in the functioning of social life, everything goes through them. People respect them without discussion because they are considered the wisest and deserve respect. Any activity requires the blessing of Olobe. The administrative authorizations issued by the Mayor of the Municipality will be ignored by people to villages if they are not accompanied by verbal blessing from the Olobe. To do this, some require special rituals. This is the purpose of the offering called "joro" which consists of the slaughter of one or more zebu heads together with a locally made rum distribution.

The problems and conflicts that appear in the villages should be discussed and resolved under the authority of Olobe. Their decision is respected by everyone and their word is equal to execution

► Class 11: Head of Fokontany

The Fokontany is in fact the basic administrative division in Madagascar. It consists of several villages and hamlet and is headed by a Chief Fokontany. It is the administrative head. A Fokontany chef has a name, an identity number and address.

► Class 12: Mayors

A Rural Municipality is the grouping of several Fokontany. It is administered by a mayor. Any official authorization issued to local level is signed by the Mayor. It represents the highest authority at the local level. A Mayor has a name, an identity number and address.

► Class 13: Market

Markets play a very important role in rural communities. It is both a place of economic exchange, and also information for the rural population. It is a place of supply for the project. The economic impact either positive or negative for the presence of mining project in the area occurs at this location. A market has coordinates and a name.

2. Conceptual Model of Communication

A picture is worth a thousand words as they say. These classes and the links between them are shown schematically in a single figure. The drawing follows the rule of HBDS structuring. The diagram obtained is the Conceptual Model of Communication of the the relational database.
For ease of reading, we used different colors to distinguish the different classes and links between classes.
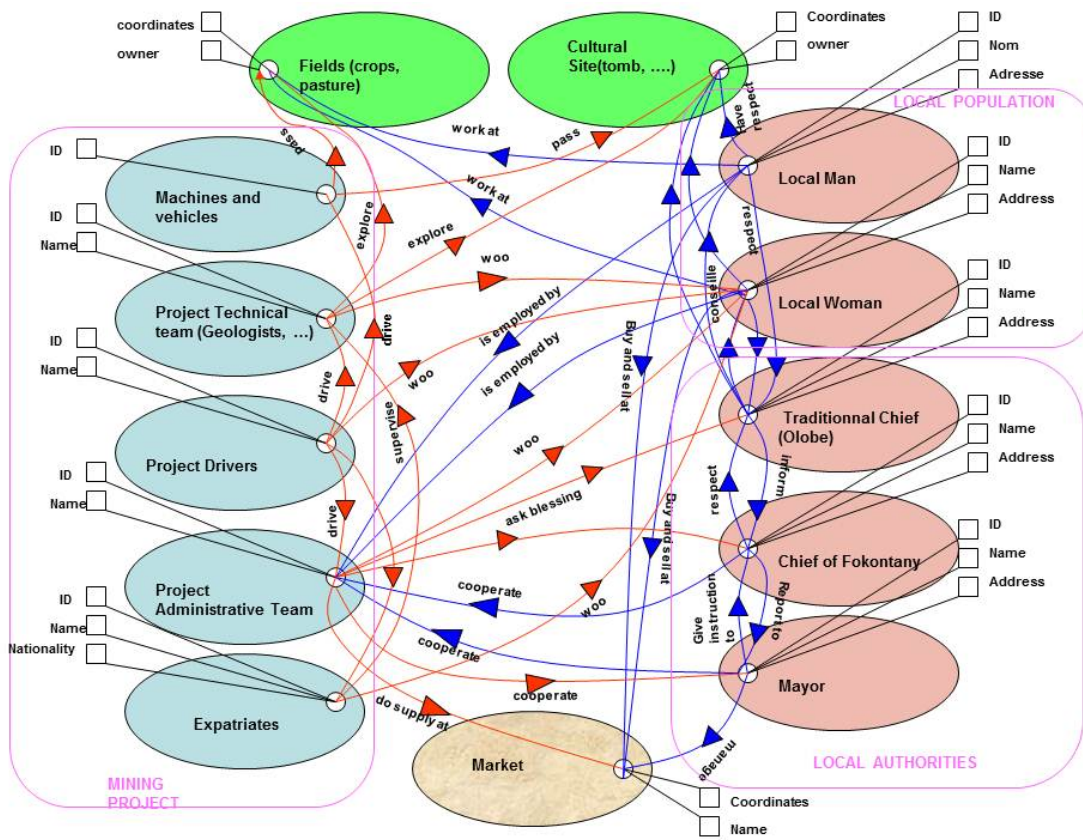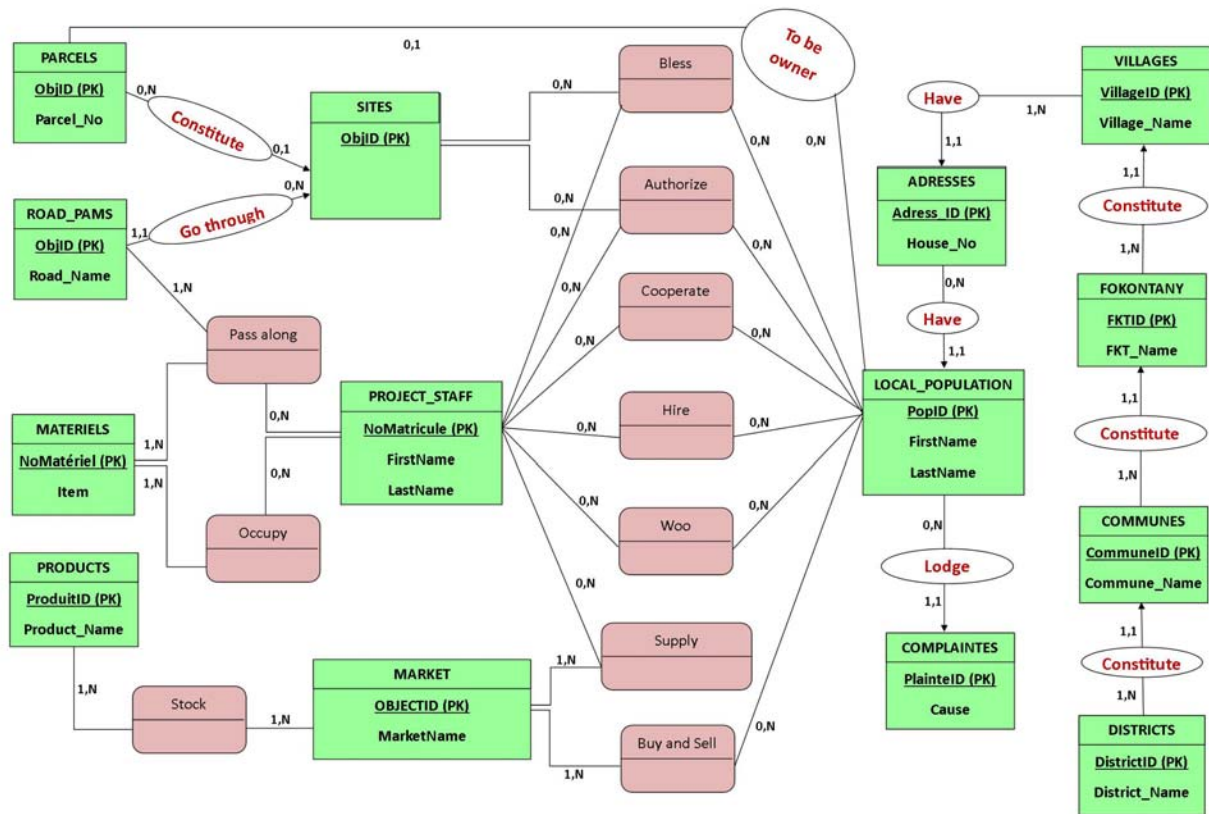

Fig.5: Conceptual Model of Communication

Fig.6: Conceptual Data Model

B. Conceptual Data Model

The Conceptual Data Model (the Model entity-relationship), used to represent the structure of the information system, the data point of view, and also defines the relationships or dependencies between different data. Note that a model "conceptual" data is independent of the state of the art technology.

This system is designed to handle the ground surveillance in the context of the cohabitation of a mining project and its host community according to the HBDS diagram above. It integrates the design aspects related to organizations, namely the place, actors, treatment type (automatic, interactive, manual) for MCD presented in the figure 6.

C. Logic Data Model

We go from conceptual data model to the logical data model by TRANSLATION operation. This is a representation of the system as it will be implemented in computers. It must therefore be minimal hypothesis on the state of the art technology that will consider. This translation requires compliance with certain rules. Six rules are needed to go from Conceptual Model to Logic Data Model

Rule 1: A property in the Conceptual dataModel becomes a column (attribute)

Rule 2 an entity becomes a table (relation)

Rule 3: The identifier of the entity becomes the primary key of the relationship

Rule 4: type of inter-entity association 1: 1
1. untranslated association.
2. It includes the primary key of a relationship as a foreign key in another relationship.

Rule 5: type of inter-entity association 1: N or N: 1
1. untranslated Association
2. we include the primary key of the relationship in which maximum cardinality is N, as a foreign key relationship in the other (the maximum cardinality is 1).
3. it includes, if any, the association property in the relationship with a maximum cardinality is 1

Rule 6: type of inter-entity combination M: N or N: M
1. the association is translated and becomes a relationship. Its key is the concatenation of the primary keys of the participating Relations
2. The properties of the association, if any, are included in this new relationship.

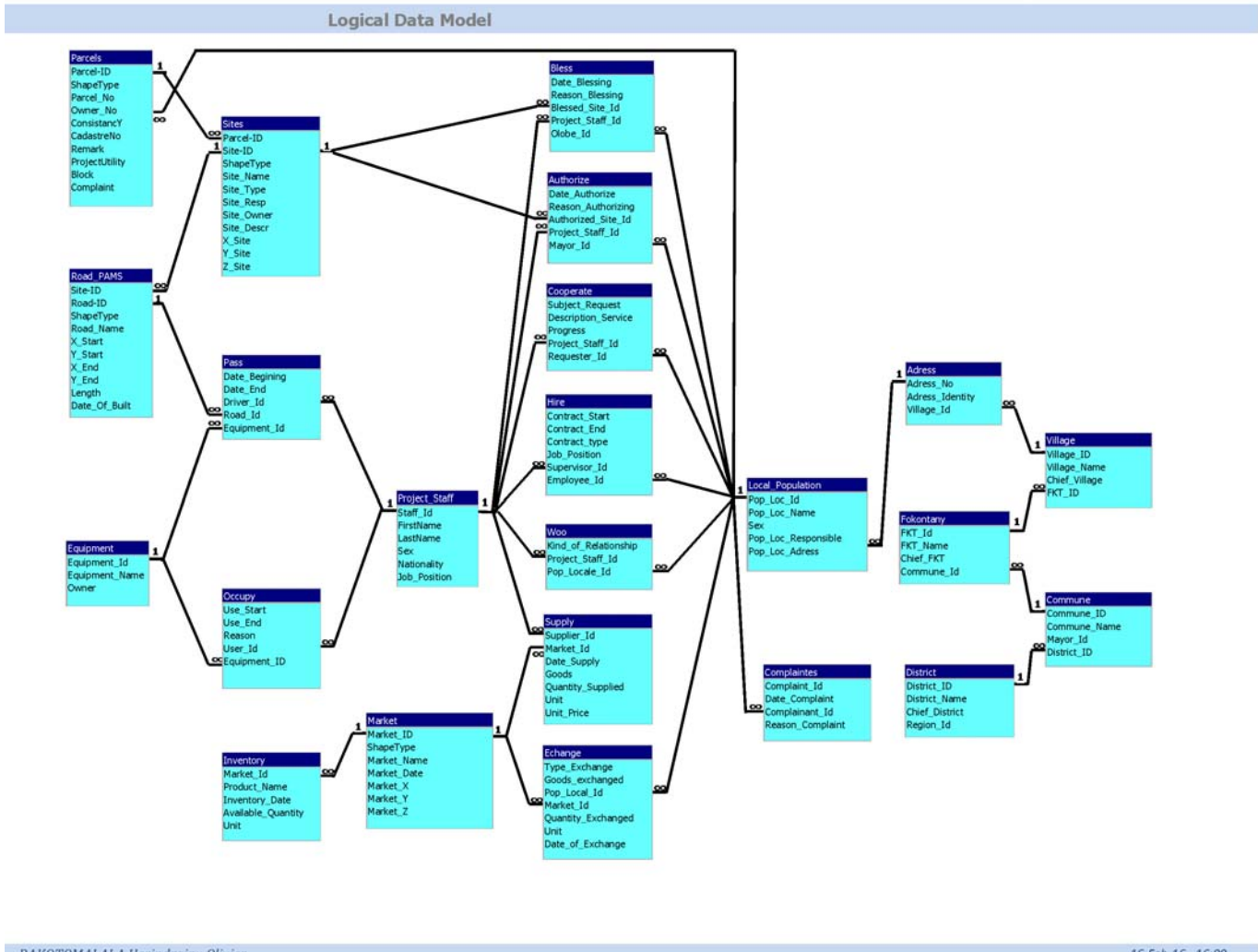By following these rules, the data logic model of the Relational Data Base System is as follows:

Fig.7: Logic Data Model

D. Physical Data Model

Physical Data Model is a step of defining data within the physical structure of the computer. It is a formalism used to specify the storage system used for a database management system. In this study we used the MICROSOFT ACCESS software for the implementation of the model.

The passage of the Logical Data Model to Physical Data Model requires that the tables that are hitherto external to the database files are translated into an integral part of the database:

- The tables described in the logic diagram become data files called "tables";
- Properties become table fields;
- Identifiers become primary keys
- Inherited keys become secondary keys

1. Creating tables and links:

By following the above rules of passage, we created 21 tables seen on the logical data model and also the different relationships taking into account their cardinality. It must specify the type of each table field. The type of each field defines a specific characteristic of the computer perspective and space reservation performed by the software in the computer disk to store data in the input records. The operation is done on Microsoft Access and also created on ARC GIS attribute tables for data related to the geometry such as the "site" entity or "parcels." We will provide an example for each to give an illustration but the details for the creation of 21 tables can be found in the appendix.

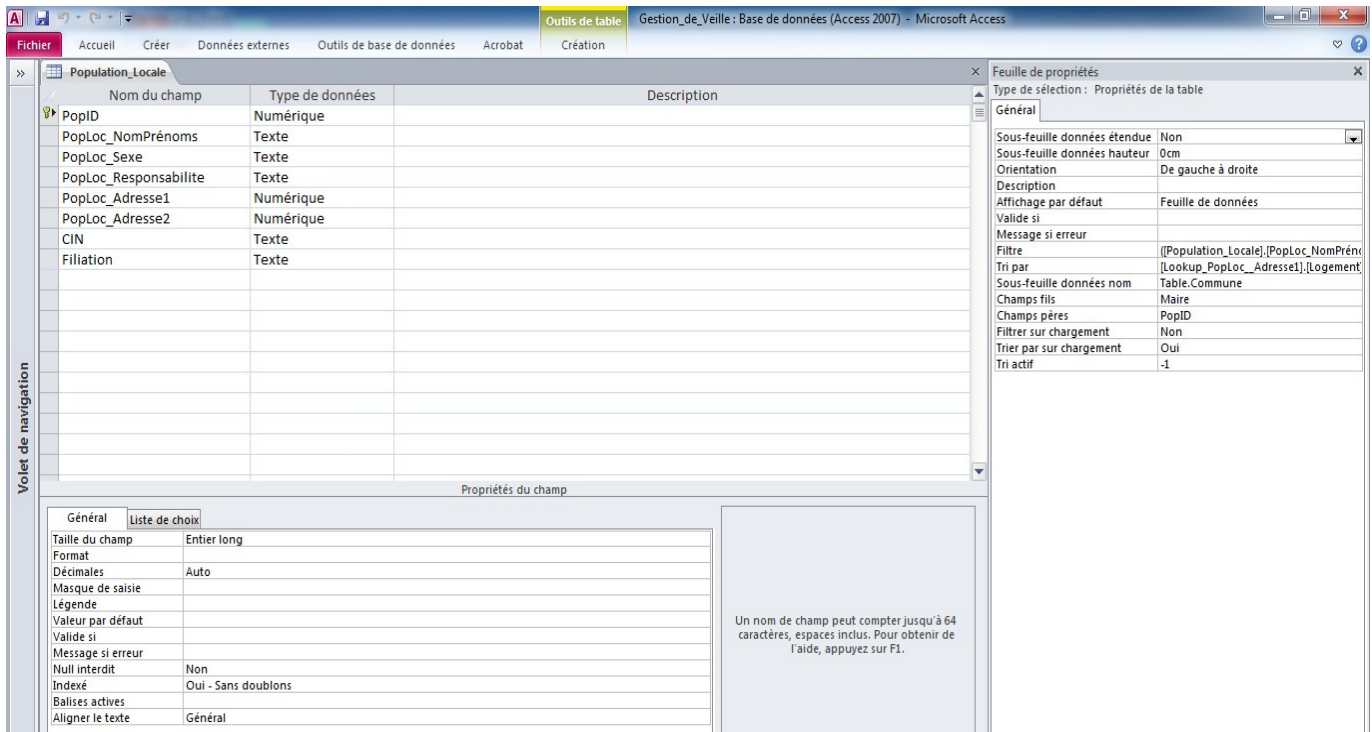Example 1: Table "local_population" created on Microsoft Access

Fig.8: Table Creation on Accesss

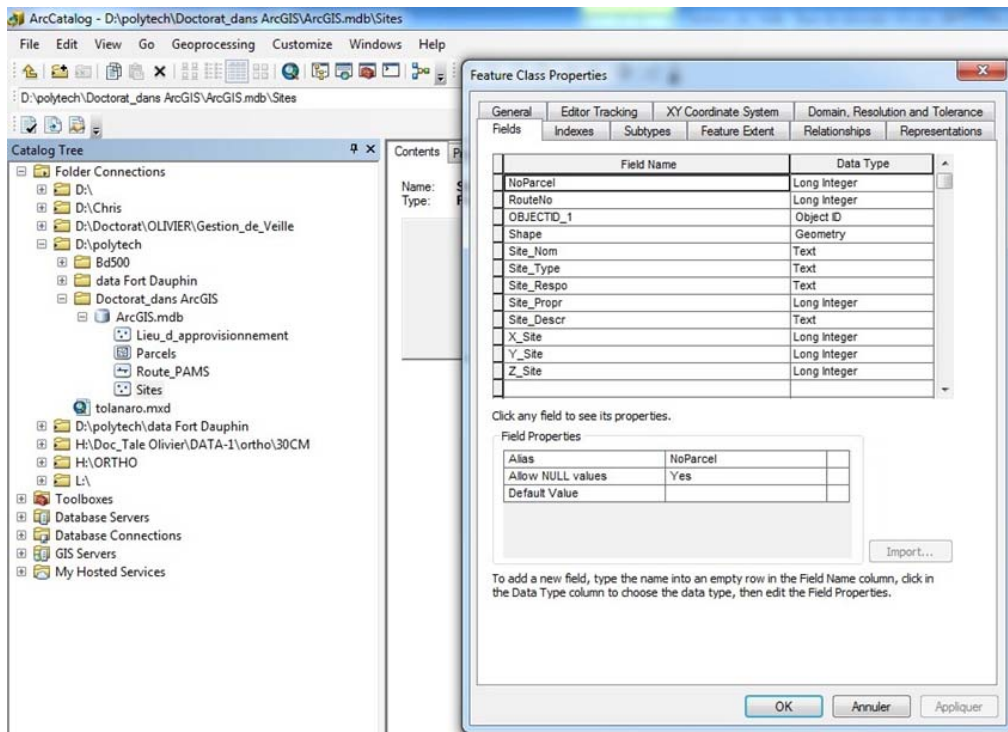Example 2: Table "Site" created on ARC GIS

Fig.9: Table Creation on ARC GIS

Fig.10: Example of Form Created for the Movement of Vehicle in the Mining Site

2. Creating Forms

A form is a database object that allows you to enter, modify or display data from a table or query. The forms can also control access to data by displaying, for example, that some fields or data lines. We also added buttons and other features to the forms to automate frequently performed operations. These forms will act as windows through which people see and reach the database. We created the drop down menus facilitate the seizure by example and avoid data type error. Here we present an example of established form for managing the entry of vehicles. To avoid errors all project vehicles already have in a table and the user chooses from a list when you enter, and for drivers travails or sites already known. The date is to choose a calendar to avoid input error. We have considered all these measures because the effectiveness of the monitoring system we try to materialize resides on the accuracy and reliability of information introduced.

3. Writing algorithms and functions forms

The forms were created and designed to meet a specific function. Algorithms written in Visual Basic for ACCESS and python for ARCGIS are designed to perform tasks related to each button on the form.

We take for instance the main form presented as follow:

Fig.11: Main Form

It allows the user to select the operation that he wants to do.

The ADD – UPDATE button allows to have access to transactions for entry and update tabular data through other forms and algorithm in Visual Basic.

The QUERY button allows the user to access different applications that we will develop later.
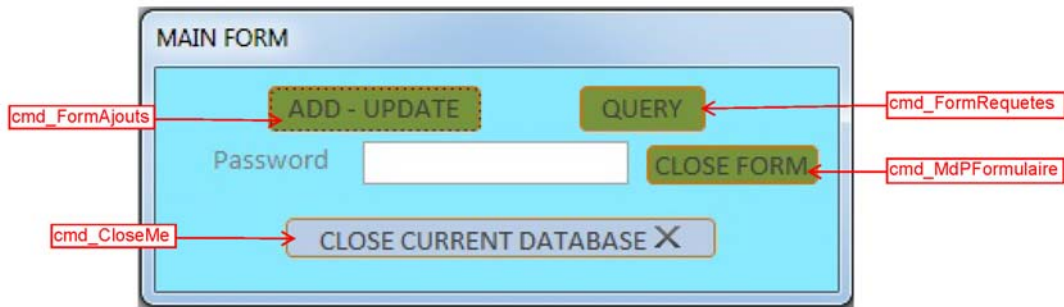
Access to the structure of the data is restricted to only a database administrator. Mishandling at this level could damage the structure and abstraction made to the database to meet the needs defined during design. That's why we have a field for entering a secret code to protect access with a password.

Note that there is an algorithm behind each button. We can see that corresponding to the main form in the following figure. All algorithms are available in Appendix

```
Form_FRM_ACCUEIL - 1

    Option Compare Database
    Option Explicit
'*********************************************************
    Private Sub cmd_CloseMe_Click()
        DoCmd.CloseDatabase
    End Sub
'*********************************************************
    Private Sub cmd_FormAjouts_Click()
        DoCmd.Close acForm, "FRM_ACCUEIL", acSaveYes
        DoCmd.OpenForm "FRM_AJOUTS", acNormal, , , acFormPropertySettings, acWindowNormal
    End Sub
'*********************************************************
    Private Sub cmd_FormRequetes_Click()
        DoCmd.Close acForm, "FRM_ACCUEIL", acSaveYes
        DoCmd.OpenForm "FRM_REQUETES", acNormal, , , acFormPropertySettings, acWindowNormal
    End Sub
'*********************************************************
    Private Sub cmd_MdPFormulaire_Click()
        Dim MDPFormulaire As String
        If txt_MDPFormulaire.Value <> "" Then
            If txt_MDPFormulaire.Value = "123" Then
                DoCmd.Close acForm, "FRM_ACCUEIL", acSaveYes
            Else
                MsgBox "MDP Formualaire incorrect", vbExclamation, "Mot de Passe"
            End If
        Else
            MsgBox "MDP Formualaire incorrect", vbExclamation, "Mot de Passe"
        End If
    End Sub
'*********************************************************
```


E. Functionalities

1. Data Entry

The software that we are trying to set up allows the entry of all the semantic as well as geometric information according to the mathematical model HBDS even the weakest signals as intimate relationships between project staff and local people for instance. For the current version, we have already created forms for entering common information widely used. Records of other tables can be entered directly without going through the forms.

The "Data Entry" correspond to the step "information gathering" of a monitoring system

The ADD and UPDATE form allows for three types of operations:
- Entering a new record
- Modification of an existing record
- Or deleting a record
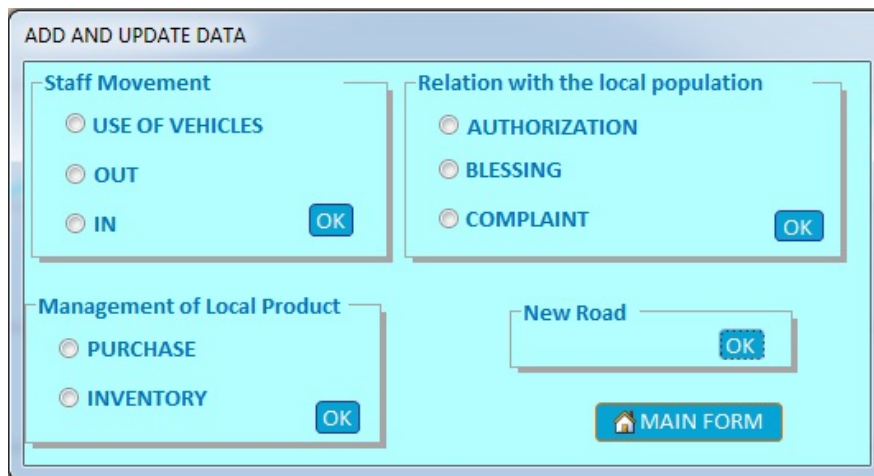
The form created is displayed as follows:

Fig.12: ADD and UPDATE FORM

Click on the ADD and UPDATE button of the main form brings up the new form that provides access to 5 ranges of activities: staff movment, relationships with local communities, management of the supply of local products, geometrical data, or return to the main form by clicking the home button. Clicking the OK button after making the choice of task to do will start a program that will execute a well-defined operation.

2. Query and Analysis

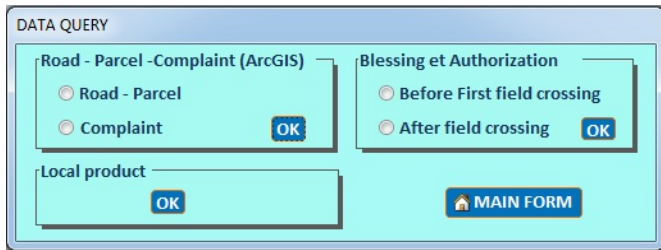Clicking the QUERY button brings up the main form in the following form:

Fig.13: QUERY FORM

It provides access to the interrogation of the system:

- Roads journeys made by staff to the project on a given date to see any plots that may be affected by the activities of the company object of this trip, and possibly the complaints from the local population. Clicking the Ok button will trigger the ARC GIS software that manages the geometric part of the database and a program written in python, which is the development language related to ARC GIS software.
- The status of sites to visit in relation to the permission and blessing of the traditional chief. Local people are very sensitive to access to their territory and subject to various conflicts that we identified at the project level.

- Information about the markets. It is also very sensitive because if the stock of a given product at a time requested by the project and local people in the market is less than the need of the company, the inflation risk is imminent which can give rise to the discontent of local people.

We can always come back at any time to the main menu by clicking the HOME button.

The system that we have set up allows the user to make queries on the stored data. There are two possible types of questions with this program: simple cross.

Simple question corresponds to a request made on tabular data and results on such a table or query on the geometric data and results on geometry.

For example we want to know the area which may be affected by a route by choosing a buffer zone of 40 meters for example. Road and Plots are all geometric information. Run this query returns to perform spatial analysis with ArcGIS. In this case, the operation returns to select the surface objects "plots" intersected by another surface object "roads". The result enables the company to see in advance the spatial distribution of possible problems if the owners are difficult.

The application form and the result is presented on the following figuress:

The route chosen was between the Beroy and DH-003 drilling point.

The cross-question corresponds to a query on the geometric data and result output on a table or query on a table and results on geometry. Taking the example above about plots intersected by a road. The system that we set up provides directly the result in tabular form giving the information about the parcels of land concerned as the owner, the consistency, the village, the residence and Commune as shown in the figure 16.
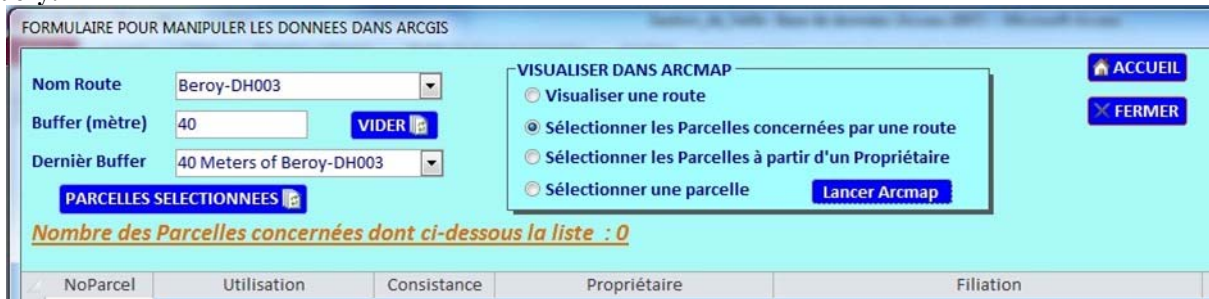
Query:

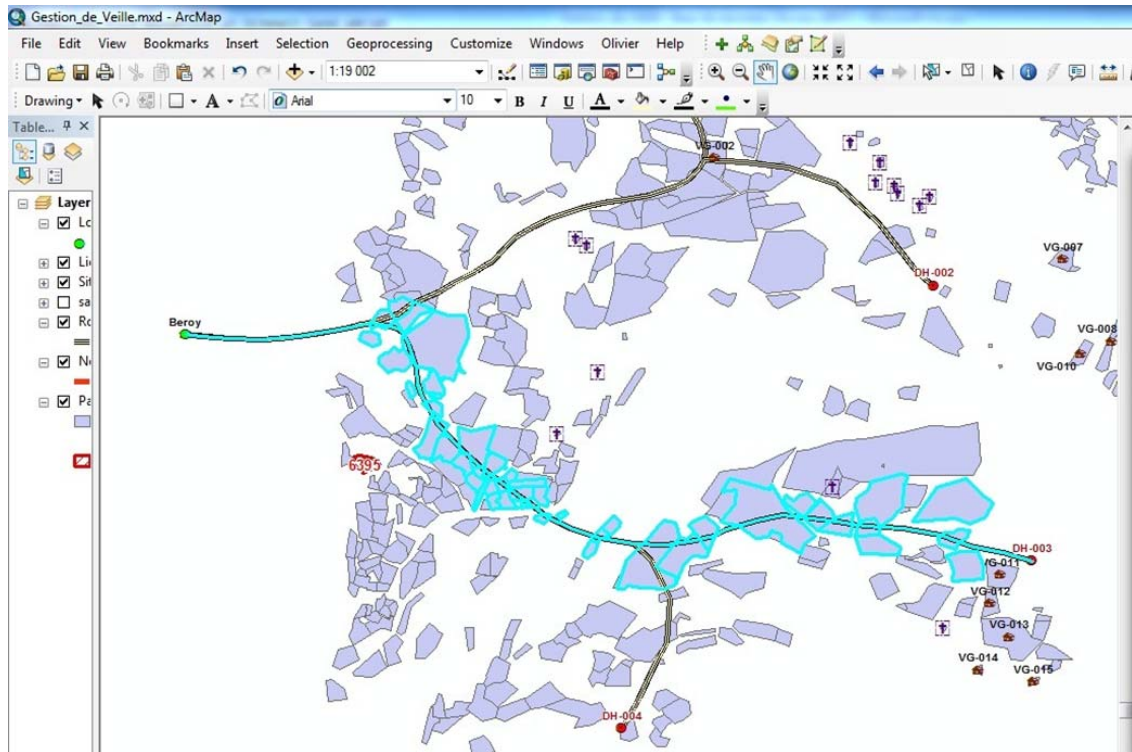Fig.14: Query to Seek Parcels Affected by a Route

Result:

Fig.15: Result of Parcels of Landintersected by a Route

Fig.16: Example of Result Cross Question

This kind of result is very important in the social conflicts management because it allows to know exactly the population affected by the work carried out by the mining company. The social responsible a the company can anticipate the approach to be set up. If we know the persons affected, their address, then we can ask the system to indicate the traditional chief in charge of this village and the local authority to be informed. We can solve the eventual conflict in advance.

Authorization and blessing to access to a parcel of land are very important to avoid conflict. Authorization is the legal procedure from the local authority but in addition of that the blessing from local traditional Chief is more important also. In fact the mining company need both to work in peace. We have written algorithms to query if the mining company got already these kind of things before accessing to a site. The following form is used to check before going to a given site, like drilling site for instance. The responsible at the mining company enters the name of the site and ask the system the status and he will take the appropriate action accordingly.

Fig.17: Form to Check Before Departure to the Site

IV. DISCUSSIONS

A. Gathering Information

The effectiveness of my proposed method relies on the accuracy and reliability of information collected. Collecting information thus requires the making available to the company with the necessary human and material resources. There are two categories of information collection: the database collection for filling different tables and collecting data for the update of this data throughout the lifecycle of the project.

1) basic data collection

This is an operation which must be conducted at the beginning of the mining project. It allows to know all the parameters of the initial conditions. This is very important insofar as we are dealing with a complex system. This type of system is very sensitive to initial conditions. A large volume of data is to be obtained through a baseline survey and it covers both the semantic and geometric data.

For semantic data, the implementation of this software requires knowledge of real data on local populations. If census data are not available at the municipalities concerned, we recommend the mining company to do it for all socio-economic information of the area. The cost thereof shall be to

amortize with reducing conflicts to manage. Besides this information is necessary for the design of any development project. If these data are accurate and up to date, the crooks who want to subtract the company money by inventing complaints while they may not be actual inhabitants of the area will be immediately detected during entry complaints with the software we designed because the name of filing complaints is directly related to a person of "local people" table. As part of this study, we have simply used the data available at the Communes. It is sure that they are outdated and reliability is not confirmed. The key for us was to have data with which we can test the method.

For geometrical data, one must have a land use map with reliable accuracy and also a fragmented state of land holdings will be linked with the local populations table. If the company follows the recommendations for the implementation of GIS proposed in this study, we can make the land use map by making scans from the orthophoto. We can seek the intervention of a company dedicated to the great works such as aerial photography and photogrammetric operations but can also enhance the internal capacity for other work such as scanning. We will need these human resources in the field for the update.

2) Update

Things are not static, changes are taking place throughout the project life. The updates should be performed periodically to maintain data reliability. There is for example the movement of the local population as the death or change of address. It becomes a bit more complicated when we are in the presence of populations of nomadic stockbreeders. The data on changes in inventories of goods in local markets should be updated periodically.

In all cases, updated or database collection, the effectiveness of the proposed method will depend on the quality of staff that do this. They must work in an objective and meaningful human relationships so that people do not hide the real information.

B. Processing Information

The handling of the software does not require a very specific skill because we have already established forms and algorithms that facilitate the use and also to guide the user in some way. For example, if the user wants to select the parcels of land that may be affected by the opening of a route to a drilling platform, the software asks him immediately specify the buffer from the axis of the track before running the query.

However, the use of the software must have a minimum of analytical ability for the results that should be conveyed to policymakers are meaningful and help make a balanced judgment on a given situation.

C. Perspective

This software, with the actual status, allows for general information about what is happening on the ground in terms of information on relational transactions between entities in

the system formed by the mining project and its hosted area, not in real time, but a way delayed and it could even be a wide gap between the occurrence of an event and the arrival of the findings at the policy level, which is the head office. Assuming that the mining company has access to the internet on ground, then we can imagine placing on cloud system to allow a user located at headquarters to work immediately on the data collected on field.

For the acquisition of geometric data, most major international companies currently require the establishment of a system called IVMS or In Vehicle Monitoring System. Vehicles are equipped with GPS and a data transmission system to the seat and allows the manager located in an office located somewhere in the world to follow a given vehicle. Typically this system has been set up for security reasons. If vehicles of the mining project has a particular type of system, we can imagine the direct integration of data on project vehicles trips in this software.

For the collection of data relating to changes in inventory on the market, we can imagine the establishment of a collaboration with the Municipalities market agents to periodically take stock of every trader and deduct the total stock. This arrangement will reduce the cost of collection but requires a means of control for the data to remain objective and real. Local inflation has created social conflicts between mining project and local population.

V. CONCLUSION

As part of implementation of major industrial projects, usually we always find solutions to technical problems but solve problems related to the social aspect is not easy to manage. For large scale mining projects in Madagascar, despite the efforts invested in social and environmental activities by mining companies, it is clear that social conflicts around these projects are still daily menu, several years after the start of operations . By a systemic approach, the work we have undertaken in the framework of this study helped to clarify these recurrent conflicts. By doing the Hypergraph Based Data Structure model, we can say that the system formed by a mining project and its host environment is a complex social system. This system is dynamic and interaction between its different elements produce unpredictable results. It's the system, not the individual behavior of each element that can cause most of these observable social conflicts. Because the prediction is not possible in the long term with a dynamic system, it is not possible to plan the results of an intervention in a given social system. It is therefore important to have a ground surveillance system that collects relevant information and then analyze for a possible anticipation of conflict or decision to adjust timely interventions. We are convinced that the software that we have established, which is a relational database management system coupled with a geographic information system, which we designed in this study meets this need and this is one of our contributions in the search for social peace for sustainable

development of areas inhabited by large scale mining projects in Madagascar.

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ANNEX 1: ALGORITHM WRITTEN IN PYTHON

```
Ajouter NewTrack dans Route_PAMS.py                                    11/10/2014
1   import arcpy
2   mxd = arcpy.mapping.MapDocument("CURRENT")
3   df = arcpy.mapping.ListDataFrames(mxd, "Layers")[0]
4   ExistRoute = arcpy.mapping.ListLayers(mxd, "Route_PAMS", df)[0]
5   NewRoute=arcpy.mapping.ListLayers(mxd, "NewTrack", df)[0]
    #"F:\OLIVIER\Gestion_de_Veille\Definitive file\NewTrack.shp"
6   Flddate="DateAjout"
7   arcpy.DeleteField_management(NewRoute, Flddate)
8   arcpy.AddField_management(NewRoute, Flddate, "DATE")
9   arcpy.CalculateField_management(NewRoute , Flddate,
    "datetime.datetime.today()", "PYTHON_9.3")
10  fieldmappings = arcpy.FieldMappings()
11  fieldmappings.addTable(ExistRoute)
12  fieldmappings.addTable(NewRoute)
13  #NomRoute append tident
14  fieldmap = fieldmappings.getFieldMap(fieldmappings.findFieldMapIndex(
    "NomRoute"))
15  fieldmap.addInputField(NewRoute, "tident")
16  fieldmappings.replaceFieldMap(fieldmappings.findFieldMapIndex("NomRoute"
    ), fieldmap)
17  #DebutX append x_proj
18  fieldmap = fieldmappings.getFieldMap(fieldmappings.findFieldMapIndex(
    "DebutX"))
19  fieldmap.addInputField(NewRoute, "x_proj")
20  fieldmappings.replaceFieldMap(fieldmappings.findFieldMapIndex("DebutX"),
    fieldmap)
21  #DebutY append y_proj
22  fieldmap = fieldmappings.getFieldMap(fieldmappings.findFieldMapIndex(
    "DebutY"))
23  fieldmap.addInputField(NewRoute, "y_proj")
24  fieldmappings.replaceFieldMap(fieldmappings.findFieldMapIndex("DebutY"),
    fieldmap)
25  #Date append DateRoute
26  fieldmap = fieldmappings.getFieldMap(fieldmappings.findFieldMapIndex(
    "DateAjout"))
27  fieldmap.addInputField(NewRoute, Flddate)
28  fieldmappings.replaceFieldMap(fieldmappings.findFieldMapIndex(
    "DateAjout"), fieldmap)
29  arcpy.Append_management(NewRoute, ExistRoute, "NO_TEST", fieldmappings ,
    "")
30  arcpy.RefreshActiveView()
31  del mxd
```

Selectionner les parcelles a partir d'un proprietaire.py   11/10/2014

```python
1   import arcpy
2   mxd = arcpy.mapping.MapDocument("CURRENT")
3   df = arcpy.mapping.ListDataFrames(mxd, "Layers")[0]
4   InPutFeat = arcpy.mapping.ListLayers(mxd, "Parcels", df)[0]
5   arcpy.SelectLayerByAttribute_management(InPutFeat, "CLEAR_SELECTION")
6   #Value of field plainte=vide
7   fieldNameCal = "Plainte"
8   arcpy.CalculateField_management(InPutFeat , fieldNameCal, "'''",
    "PYTHON_9.3")
9   #selection parcel
10  fieldsel=" NoPropriétaire = 1"
11  arcpy.SelectLayerByAttribute_management(InPutFeat , "NEW_SELECTION",
    fieldsel)
12  df.extent = InPutFeat.getSelectedExtent(False)
13  #df.scale = df.scale*2
14  #Calculate value
15  arcpy.CalculateField_management(InPutFeat , fieldNameCal, "'Yes'",
    "PYTHON_9.3")
16  arcpy.SelectLayerByAttribute_management(InPutFeat, "CLEAR_SELECTION")
17  arcpy.RefreshActiveView()
18  del mxd
```

Selectionner les parcelles concernees par une route.py   11/10/2014

```python
1   import arcpy
2   mxd = arcpy.mapping.MapDocument("CURRENT")
3   df = arcpy.mapping.ListDataFrames(mxd, "Layers")[0]
4   SelectFeat = arcpy.mapping.ListLayers(mxd, "Route_PAMS", df)[0]
5   SelectField=" NomRoute = 'Beroy-DH004'"
6   InPutFeat = arcpy.mapping.ListLayers(mxd, "Parcels", df)[0]
7   fieldName = "ProjetUtilité"
8   BufferDistance="10 Meters"
9   ValFieldName="'Beroy-DH004'"
10  SelectField2=" ProjetUtilité like '*Beroy-DH004'"
11  arcpy.SelectLayerByAttribute_management(InPutFeat, "NEW_SELECTION",
    SelectField2)
12  arcpy.CalculateField_management(InPutFeat , fieldName, "'''",
    "PYTHON_9.3")
13  arcpy.SelectLayerByAttribute_management(InPutFeat, "CLEAR_SELECTION")
14  arcpy.SelectLayerByAttribute_management(SelectFeat, "NEW_SELECTION",
    SelectField)
15  df.extent = SelectFeat.getSelectedExtent(False)
16  df.scale = df.scale*1.2
17  arcpy.SelectLayerByLocation_management (InPutFeat , "WITHIN_A_DISTANCE",
     SelectFeat, BufferDistance, "NEW_SELECTION")
18  arcpy.CalculateField_management(InPutFeat , fieldName, "'" +
    BufferDistance + "'" + "' of '" + ValFieldName, "PYTHON_9.3")
19  arcpy.RefreshActiveView()
20  del mxd
```

Selectionner une parcelle a partir de son numero.py   11/10/2014

```python
1   import arcpy
2   mxd = arcpy.mapping.MapDocument("CURRENT")
3   df = arcpy.mapping.ListDataFrames(mxd, "Layers")[0]
4   InPutFeat = arcpy.mapping.ListLayers(mxd, "Parcels", df)[0]
5   arcpy.SelectLayerByAttribute_management(InPutFeat, "CLEAR_SELECTION")
6   #Value of field plainte=vide
7   fieldNameCal = "Plainte"
8   arcpy.CalculateField_management(InPutFeat , fieldNameCal, "''",
    "PYTHON_9.3")
9   #selection parcel
10  fieldsel=" NoParcel = '6386'"
11  arcpy.SelectLayerByAttribute_management(InPutFeat , "NEW_SELECTION",
    fieldsel)
12  df.extent = InPutFeat.getSelectedExtent(False)
13  df.scale = df.scale*30
14  #Calculate value
15  arcpy.CalculateField_management(InPutFeat , fieldNameCal, "'Yes'",
    "PYTHON_9.3")
16  arcpy.SelectLayerByAttribute_management(InPutFeat, "CLEAR_SELECTION")
17  arcpy.RefreshActiveView()
18  del mxd
```

Selectionner une route.py   11/10/2014

```python
1   import arcpy
2   mxd = arcpy.mapping.MapDocument("CURRENT")
3   df = arcpy.mapping.ListDataFrames(mxd, "Layers")[0]
4   SelectFeat = arcpy.mapping.ListLayers(mxd, "Route_PAMS", df)[0]
5   SelectField=" NomRoute = 'Beroy-DH002'"
6   arcpy.SelectLayerByAttribute_management("Parcels", "CLEAR_SELECTION")
7   arcpy.SelectLayerByAttribute_management(SelectFeat, "NEW_SELECTION",
    SelectField)
8   df.extent = SelectFeat.getSelectedExtent(False)
9   df.scale = df.scale*1.2
10  arcpy.RefreshActiveView()
11  del mxd
```

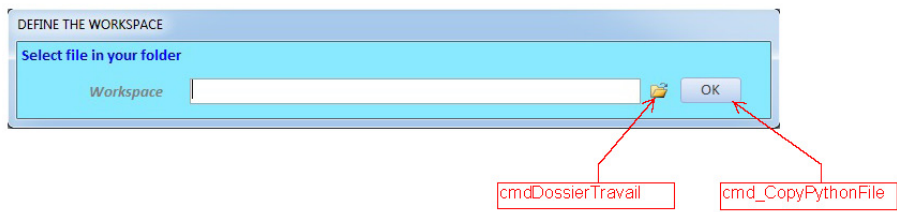ANNEX 2: EXAMPLE OF ALGORITHM WRITTEN IN VISUAL BASIC

```
Form_FRM_BIENVENU - 1

    Option Compare Database
    Option Explicit
'***************************************************************
    Private Sub cmd_CopyPythonFile_Click()
        Dim fso As Object, strFolderName As String
        Set fso = CreateObject("Scripting.FileSystemObject")
        If Not fso.FolderExists("C:\FichierPythonGestionVeille") Then
            fso.CreateFolder "C:\FichierPythonGestionVeille"
        End If
        If txtFolderPath.Value <> "" Then
            strFolderName = txtFolderPath.Value
            fso.CopyFile strFolderName & "Ajouter NewTrack dans Route_PAMS.py", "C:\FichierPythonGestionVeille" & _
            "\Ajouter NewTrack dans Route_PAMS.py", True
            fso.CopyFile strFolderName & "Selectionner les parcelles a partir d'un proprietaire.py", "C:\" & _
            "FichierPythonGestionVeille\Selectionner les parcelles a partir d'un proprietaire.py", True
            fso.CopyFile strFolderName & "Selectionner une parcelle a partir de son numero.py", "C:\" & _
            "FichierPythonGestionVeille\Selectionner une parcelle a partir de son numero.py", True
            fso.CopyFile strFolderName & "Selectionner les parcelles concernees par une route.py", "C:\" & _
            "FichierPythonGestionVeille\Selectionner les parcelles concernees par une route.py", True
            fso.CopyFile strFolderName & "Selectionner une route.py", "C:\FichierPythonGestionVeille\Selectionner une route.py", True
            Set fso = Nothing
        End If
        DoCmd.Close acForm, "FRM_BIENVENU", acSaveYes
    End Sub
'***************************************************************
    Public Sub cmdDossierTravail_Click()
        Dim strFolderName As String, strFile As String
        Dim F As Office.FileDialog
        Set F = application.FileDialog(3)
        F.AllowMultiSelect = False
        F.Title = "Selectionnez n'importe quel fichier"
        Dim SQLUpd As String
        If F.Show Then
            Dim i As Integer
            For i = 1 To F.SelectedItems.Count
                strFile = Dir(F.SelectedItems(i))
                txtFolderPath.Value = Left(F.SelectedItems(i), Len(F.SelectedItems(i)) - Len(strFile))
                strFolderName = txtFolderPath.Value
                SQLUpd = "UPDATE [Domaine de travail] SET [Domaine de travail].PathTravail =  '" & strFolderName & "';"
                Dim dbcurr As DAO.Database
                DoCmd.SetWarnings False
                DoCmd.RunSQL SQLUpd
                DoCmd.SetWarnings True
            Next i
        End If
    End Sub
'***************************************************************


Form_FRM_BIENVENU - 2

    Private Sub Form_Load()
        Dim fso As Object, strFolderName As String
        Set fso = CreateObject("Scripting.FileSystemObject")
        If fso.FileExists("C:\FichierPythonGestionVeille\Selectionner une route.py") _
        And fso.FileExists("C:\FichierPythonGestionVeille\Selectionner les parcelles concernees par une route.py") _
        And fso.FileExists("C:\FichierPythonGestionVeille\Selectionner une parcelle a partir de son numero.py") _
        And fso.FileExists("C:\FichierPythonGestionVeille\Selectionner les parcelles a partir d'un proprietaire.py") _
        And fso.FileExists("C:\FichierPythonGestionVeille\Ajouter NewTrack dans Route_PAMS.py") Then
            DoCmd.Close acForm, "FRM_BIENVENU", acSaveYes
            DoCmd.OpenForm "FRM_ACCUEIL", acNormal, , , acFormPropertySettings, acWindowNormal
        End If
        Set fso = Nothing
    End Sub
'***************************************************************
```
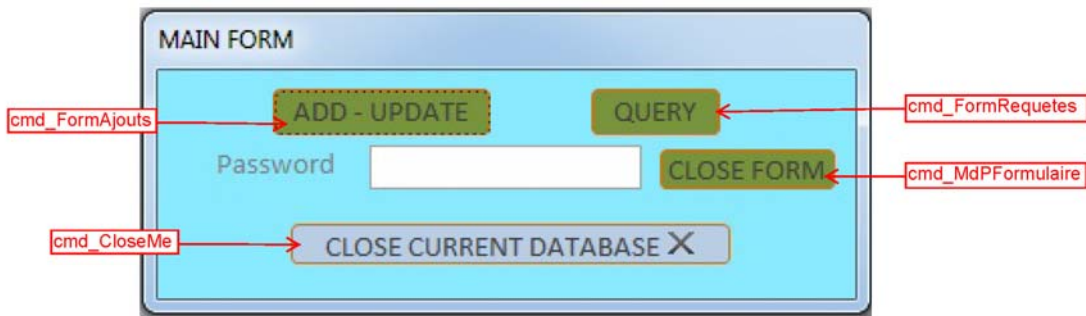

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```
Form_FRM_ACCUEIL - 1

    Option Compare Database
    Option Explicit
'********************************************************
    Private Sub cmd_CloseMe_Click()
        DoCmd.CloseDatabase
    End Sub
'********************************************************
    Private Sub cmd_FormAjouts_Click()
        DoCmd.Close acForm, "FRM_ACCUEIL", acSaveYes
        DoCmd.OpenForm "FRM_AJOUTS", acNormal, , , acFormPropertySettings, acWindowNormal
    End Sub
'********************************************************
    Private Sub cmd_FormRequetes_Click()
        DoCmd.Close acForm, "FRM_ACCUEIL", acSaveYes
        DoCmd.OpenForm "FRM_REQUETES", acNormal, , , acFormPropertySettings, acWindowNormal
    End Sub
'********************************************************
    Private Sub cmd_MdPFormulaire_Click()
        Dim MDPFormulaire As String
        If txt_MDPFormulaire.Value <> "" Then
            If txt_MDPFormulaire.Value = "123" Then
                DoCmd.Close acForm, "FRM_ACCUEIL", acSaveYes
            Else
                MsgBox "MDP Formualaire incorrect", vbExclamation, "Mot de Passe"
            End If
        Else
            MsgBox "MDP Formualaire incorrect", vbExclamation, "Mot de Passe"
        End If
    End Sub
'********************************************************
```



```
    Option Explicit
'********************************************************
    Private Sub cmd_GoToAccueil_Click()
        DoCmd.Close acForm, Me.Form.Name, acSaveYes
        Call OpenAccueil
    End Sub
'********************************************************
    Private Sub cmd_MvtPersOK_Click()
        Select Case CadreMvtPers.Value
        Case 1
            DoCmd.Close acForm, "FRM_AJOUTS", acSaveYes
            DoCmd.Close acForm, "FRM_ACCUEIL", acSaveYes
            DoCmd.OpenForm "VEHICULES_USAGE", acNormal, , , acFormAdd, acWindowNormal
            Forms![VEHICULES_USAGE]!txtDateSortie.Visible = False
            Forms![VEHICULES_USAGE]!Étiq_DateSortie.Visible = False
        Case 2
            DoCmd.Close acForm, "FRM_AJOUTS", acSaveYes
            DoCmd.Close acForm, "FRM_ACCUEIL", acSaveYes
            DoCmd.OpenForm "VEHICULES_SORTIE", acNormal, , , acFormAdd, acWindowNormal
        Case 3
            DoCmd.Close acForm, "FRM_AJOUTS", acSaveYes
            DoCmd.Close acForm, "FRM_ACCUEIL", acSaveYes
            DoCmd.OpenForm "VEHICULES_ENTREE", acNormal, , , acFormAdd, acWindowNormal
        Case Else
            MsgBox "Choisissez si ENTREE ou SORTIE des personnels", vbQuestion, "Circulation des personnels"
        End Select
    End Sub
'********************************************************
    Private Sub cmd_OpenFormAddRoute_Click()
        DoCmd.Close acForm, "FRM_AJOUTS", acSaveYes
        DoCmd.Close acForm, "FRM_ACCUEIL", acSaveYes
        DoCmd.OpenForm "AJOUT_ROUTE", acNormal, , , acFormAdd, acWindowNormal
    End Sub
'********************************************************
    Private Sub cmd_ProduitsLocauxOK_Click()
        Select Case CadreProduitsLocaux.Value
            Case 1
                DoCmd.Close acForm, "FRM_AJOUTS", acSaveYes
                DoCmd.Close acForm, "FRM_ACCUEIL", acSaveYes
                DoCmd.OpenForm "AJOUT_ACHAT", acNormal, , , acFormAdd, acWindowNormal
            Case 2
                DoCmd.Close acForm, "FRM_AJOUTS", acSaveYes
                DoCmd.Close acForm, "FRM_ACCUEIL", acSaveYes
                DoCmd.OpenForm "AJOUT_STOCKS", acNormal, , , acFormAdd, acWindowNormal

            Case Else
                MsgBox "Choisissez si ACHAT ou STOCKS des produits", vbQuestion, "Gestion des Produits Locaux"
        End Select
    End Sub
'********************************************************
    Private Sub cmd_RelationsLocalesOK_Click()
        Select Case CadreRelationLocale.Value
```

```
Form_FRM_AJOUTS - 2

        Case 1
            DoCmd.Close acForm, "FRM_AJOUTS", acSaveYes
            DoCmd.Close acForm, "FRM_ACCUEIL", acSaveYes
            DoCmd.OpenForm "AJOUT_AUTORISATION", acNormal, , , acFormAdd, acWindowNormal
        Case 2
            DoCmd.Close acForm, "FRM_AJOUTS", acSaveYes
            DoCmd.Close acForm, "FRM_ACCUEIL", acSaveYes
            DoCmd.OpenForm "AJOUT_BENEDICTION", acNormal, , , acFormAdd, acWindowNormal
        Case 3
            DoCmd.Close acForm, "FRM_AJOUTS", acSaveYes
            DoCmd.Close acForm, "FRM_ACCUEIL", acSaveYes
            DoCmd.OpenForm "AJOUT_PLAINTES", acNormal, , , acFormAdd, acWindowNormal
        Case Else
            MsgBox "Choisissez si AUTORISATION ou BENEDICTION", vbQuestion, "Relations avec les Populations Locales"
    End Select
End Sub
'************************************************************
```
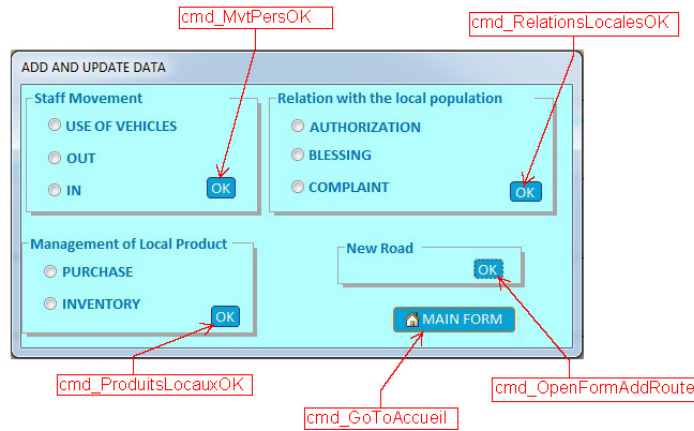


```
Option Explicit
'************************************************************
Private Sub cmd_Ajout_Click()
    Dim obj As Control
    For Each obj In Form.Controls
        If Not (obj.Name Like "*tiq*" Or obj.Name Like "cmd*") Then
            obj = ""
        End If
    Next
    SiteAyantBenediction.Locked = False
    DateBénédiction.Locked = False
    DateBénédiction.SetFocus
End Sub
'************************************************************
Private Sub cmd_EnregistrerBENI_Click()
    Dim SiteNum As String, DatyAutorise As Date
    SiteNum = SiteAyantBenediction.Value
    Dim daty As Date
    daty = Format(DateBénédiction.Value, "MM, DD, YYYY")
    Dim Db As DAO.Database
    Set Db = CurrentDb
    Dim r As DAO.Recordset
    Dim SQL As String
    SQL = "SELECT Bénir.* FROM Bénir WHERE (((Bénir.SiteAyantBenediction)= " & SiteNum & ") and  " & _
            "((Bénir.DateBénédiction)= #" & daty & "#));"
    Set r = Db.OpenRecordset(SQL)
    If r.RecordCount > 0 Then
        CurrentDb.Execute "UPDATE Bénir SET Bénir.ObjetBénédiction = '" & ObjetBénédiction.Value & "',  " & _
                "Bénir.ReprésentantSociété = '" & ReprésentantSociété.Value & "', Bénir.Olobe = '" & _
                Olobe.Value & "' WHERE (((Bénir.SiteAyantBenediction)=" & SiteAyantBenediction.Value & ")  " & _
                "AND ((Bénir.DateBénédiction)= # " & daty & "#));"
    Else
        CurrentDb.Execute "INSERT INTO Bénir ( DateBénédiction, ReprésentantSociété,  " & _
                "ObjetBénédiction,SiteAyantBenediction , Olobe ) " & _
                " SELECT #" & daty & "#, '" & ReprésentantSociété.Value & "', '" & ObjetBénédiction.Value & "' " & _
                ", " & SiteNum & ", " & Olobe.Value & ";"
    End If
    lstSiteBeni.Requery
    Call cmd_Ajout_Click
End Sub

'************************************************************
Private Sub cmd_FermerForm_Click()
    DoCmd.Close acForm, Me.Form.Name, acSaveYes
    DoCmd.OpenForm "FRM_AJOUTS", acNormal, , , acFormPropertySettings, acWindowNormal
End Sub
'************************************************************
Private Sub cmd_GoToAccueil_Click()
    DoCmd.Close acForm, Me.Form.Name, acSaveYes
    Call OpenAccueil
End Sub
'************************************************************
```

```
Form_AJOUT_BENEDICTION - 2

    Private Sub cmd_Modification_Click()
        Dim SiteNum As String, DatyAutorise As Date
        If IsNull(lstSiteBeni) Then
            MsgBox "Séléctionner une ligne à modifier d'abord", vbExclamation, "Modification d'un enregistrement"
        Else
            SiteNum = lstSiteBeni.Column(0)
            DatyAutorise = Format(lstSiteBeni.Column(1), "MM, DD, YYYY")
            Dim Db As DAO.Database
            Set Db = CurrentDb
            Dim r As DAO.Recordset
            Dim SQL As String
            SQL = "SELECT Bénir.DateBénédiction, Bénir.ObjetBénédiction, Bénir.SiteAyantBenediction,  " & _
                "Sites.Site_Nom, Bénir.ReprésentantSociété, Bénir.Olobe " & _
                "FROM Sites INNER JOIN Bénir ON Sites.OBJECTID_1 = Bénir.SiteAyantBenediction   " & _
                "WHERE (((Sites.Site_Nom)= '" & SiteNum & "') and ((Bénir.DateBénédiction)= #" & DatyAutorise & "#));"
            Set r = Db.OpenRecordset(SQL)
            DateBénédiction.Value = r![DateBénédiction]
            ObjetBénédiction.Value = r![ObjetBénédiction]
            SiteAyantBenediction.Value = r![SiteAyantBenediction]
            ReprésentantSociété.Value = r![ReprésentantSociété]
            Olobe.Value = r![Olobe]
            r.Close
            Set r = Nothing
            Db.Close
            Set Db = Nothing
            SiteAyantBenediction.Locked = True
            DateBénédiction.Locked = True
        End If
    End Sub
'***************************************************
    Private Sub cmd_Suppression_Click()
        Dim SiteNum As String, DatyAutorise As Date
        If IsNull(lstSiteBeni) Then
            MsgBox "Séléctionner une ligne à supprimer d'abord", vbExclamation, "Suppression d'un enregistrement"
        Else
            SiteNum = lstSiteBeni.Column(0)
            DatyAutorise = Format(lstSiteBeni.Column(1), "MM, DD, YYYY")
            CurrentDb.Execute "DELETE Bénir.* FROM Sites INNER JOIN Bénir ON Sites.OBJECTID_1 = Bénir.SiteAyantBenediction " & _
                "WHERE (((Sites.Site_Nom)='" & SiteNum & "') AND ((Bénir.DateBénédiction)=#" & DatyAutorise & "#));"
            lstSiteBeni.Requery
        End If
    End Sub
'***************************************************
```
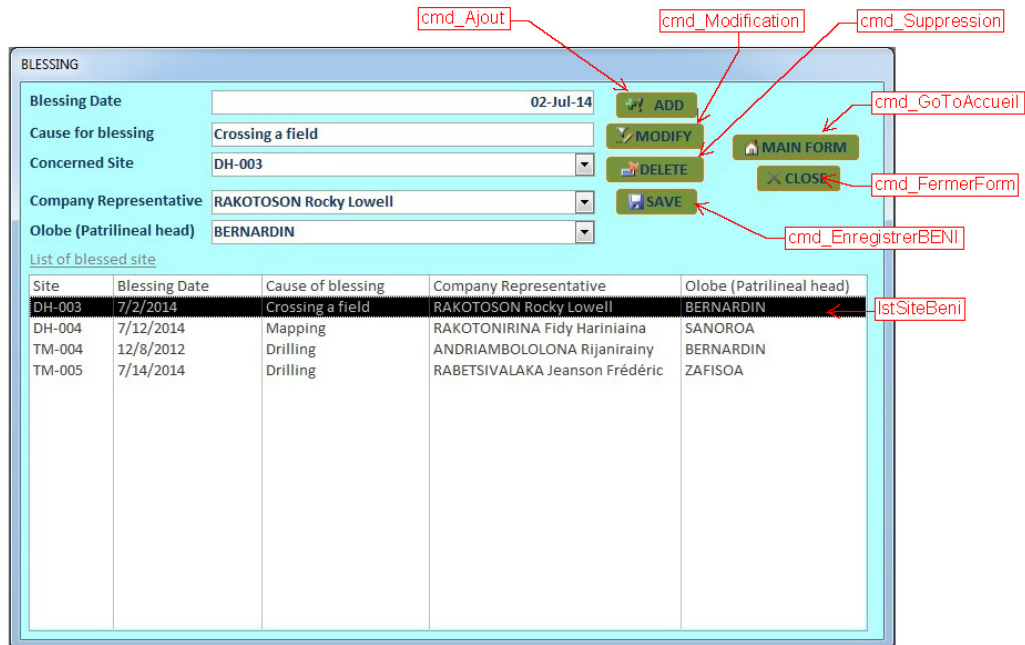
```
Form_FRM_REQUETES - 1

    Option Compare Database
    Option Explicit
'****************************************************************
    Private Sub cmd_BeniAutoriseOK_Click()
        Select Case Me.Cadre2
            Case 1
                DoCmd.Close acForm, "FRM_REQUETES", acSaveYes
                Call CloseAccueil
                DoCmd.OpenForm "Passer", acNormal, , , acFormPropertySettings, acWindowNormal
            Case 2
                DoCmd.Close acForm, "FRM_REQUETES", acSaveYes
                Call CloseAccueil
                DoCmd.OpenForm "SiteAPasse", acNormal, , , acFormPropertySettings, acWindowNormal
        End Select
    End Sub
'****************************************************************
    Private Sub cmd_GoToAccueil_Click()
        DoCmd.Close acForm, Me.Form.Name, acSaveYes
        Call OpenAccueil
    End Sub
'****************************************************************
    Private Sub cmd_OpenFormArcGIS_Click()
        Select Case Me.Cadre1
            Case 1
                DoCmd.Close acForm, "FRM_REQUETES", acSaveYes
                Call CloseAccueil
                DoCmd.OpenForm "ARCGIS", acNormal, , , acFormPropertySettings, acWindowNormal
            Case 2
                DoCmd.Close acForm, "FRM_REQUETES", acSaveYes
                Call CloseAccueil
                DoCmd.OpenForm "REQ_PLAINTES", acNormal, , , acFormPropertySettings, acWindowNormal
        End Select

    End Sub
'****************************************************************
    Private Sub cmd_OpenFormStock_Click()
        DoCmd.Close acForm, "FRM_REQUETES", acSaveYes
        Call CloseAccueil
        DoCmd.OpenForm "STOCK", acNormal, , , acFormPropertySettings, acWindowNormal
    End Sub
'****************************************
```