



## Planning for the responsible extraction of natural aggregates

The case of Hoa Binh Province/Hanoi Metropolitan Area

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### **Planning for the responsible extraction of natural aggregates –**

The case of Hoa Binh Province/Hanoi Metropolitan Area

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# **Planning for the responsible extraction of natural aggregates**

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Hanoi Metropolitan Area



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## 1. Introduction

It is recognized in the literature that during the transition process from a primary (retrieval and production of raw materials) to a secondary sector economy (transformation of raw materials), the consumption of natural aggregates (stone, sand and gravel) “increases in the same or even a higher degree than the economic performance” (Tiess and Kriz 2011:63). Both politically and economically, Vietnam is quickly moving towards a market economy. Increased urbanization and industrialization are creating greater markets for the use of aggregates, particularly in high growth urban areas such as Ho Chi Minh City Region and the Hanoi Capital Region (HCR).

Two main concerns have been raised regarding the sustainable extraction of natural aggregates (EU 2000): (a) aggregates are non-renewable minerals, which imply that they will not be available for future generations; and (b) the extraction of aggregates generates high environmental impacts (e.g. inefficiencies in transport, energy usage, CO<sub>2</sub> emissions and large-scale alterations of the landscape). To face these challenges, it is important to implement a comprehensive legal and planning framework for the extraction of aggregates. The absence of an appropriate framework may produce negative social and environmental impacts while encouraging the rise and spread of illegal activities.

Worldwide, little progress has been made concerning the sustainable management of aggregate resources (Langer and Tucker 2013). Shortages or oversupply of materials due to poor planning as well as limited access to deposits, even in more advanced economies, reflect the lack of understanding of the finite character of the resources and of the role of aggregates in fulfilling socio-economic development goals.

As the demand for construction material in Vietnam is expected to continue, it is vital to closely examine local planning mechanisms for the extraction of aggregates. This is particularly relevant when we consider the increasing political focus on promoting a responsible management of the country’s mining resources (Decision 2427/2011/QĐ-TTg; Circular 05/2018/TT-BXD). Vietnam’s Long-Term Strategy for the Exploitation of Mineral Resources until 2020 with the Vision 2030 (Decision 2427/2011/QĐ-TTg) points out that minerals, as non-renewable resources, must be managed, protected, exploited and used rationally, economically and efficiently to meet the country’s aim of further industrialization and modernization.

Against this background, the objective of this report is threefold:

- To analyze the requirements for implementing a responsible and sustainability-oriented planning policy for natural aggregates, based on internationally recognized good practices;
- To provide an overview of the policies and planning instruments affecting the extraction of aggregates in the HCR and one of its provinces, Hoa Binh;
- To propose a planning instrument which may help to avoid land use conflicts and promotes a more responsible extraction of mineral resources.

In the following section, we analyze the conceptual understanding of a sustainable and comprehensive planning approach to mining. Section 3 provides a discussion of national, metropolitan and provincial planning instruments affecting the extraction of aggregates in Vietnam. A new planning instrument is described in Section 4. Finally, some conclusions are offered on the Vietnamese planning systems in order to contribute to a more sustainable mining of natural aggregates. While the analysis is based on the experience of Hoa Binh province, the findings may be more broadly applicable.

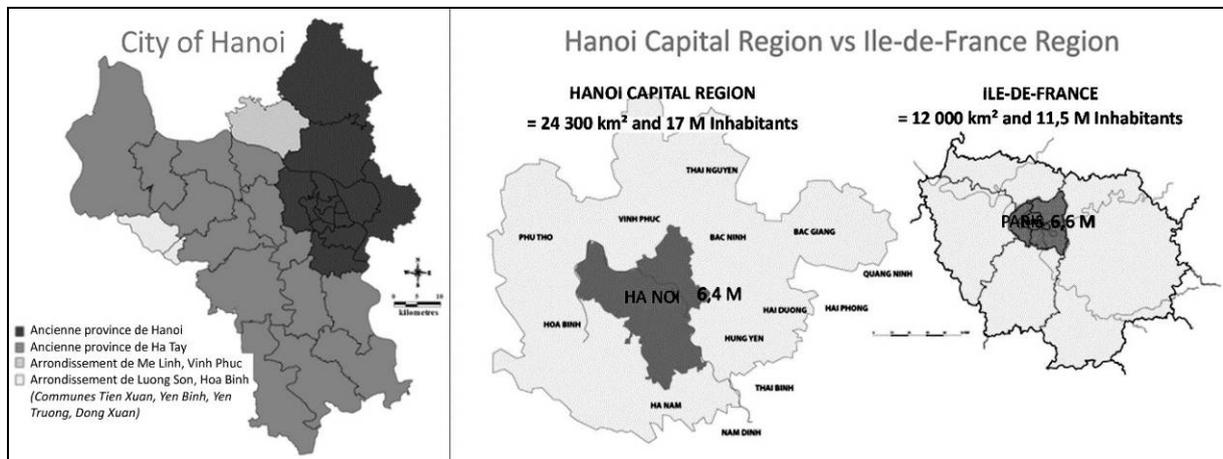
## 2. Responsible and sustainability-oriented management of aggregate mining

### 2.1 Hanoi Capital Region: Urbanization promotion and demand for aggregates

Urban areas contribute around 70-75 % of Vietnam's annual GDP. For this reason, a major goal of the Central Government is to promote and support urbanization. According to a World Bank Report (2011:11): "striving for higher classification standards has become a major preoccupation of local government authorities as urban areas of higher classes receive greater recognition and shares of financial resources." Currently, alongside governmental incentives to cities and towns to move up the urban class ladder, the two main driving forces behind urbanization in Vietnam are public investment in infrastructure and the opening up of land to lease holding.

In general, the production of aggregates is closely linked to a country's population and industrial development. Increased industrialization and urbanization in Vietnam is thus creating greater markets for the use of natural aggregates, particularly in high-growth areas such as the Hanoi Capital Region (HCR). The HCR consists of the City of Hanoi and 9 neighbouring provinces, including Hoa Binh province. (Figure 1). In its actual extension, the City of Hanoi was created by adding Ha Tay province, the Me Linh district of Vinh Phuc province and some districts of Hoa Binh province to Old Hanoi. This territorial restructuring reveals metropolitan dynamics in all respects: economic, demographic and spatial. The expansion took place after a long period of discussion, particularly regarding the planning difficulties of coordinating urban development and transport planning. As urban areas expand, local sources of natural aggregates become less accessible and must be brought from more distant sources at greater costs (USGS, 1999).

Figure 1: Hanoi Capital Region



Sources: Quan Son (2015) and Ministry of Construction (VIUP 2012)

Aggregates for construction are intensively mined in Vietnam. However, there is a lack of systematic knowledge of the location, distribution and quality of deposits, while legislation and land-use planning requirements also affect the extraction of materials. Neither the government nor the relevant industrial mining associations maintain statistics about their location, size and future production and by geological subtype.

In view of the continuing need for aggregates, provisions must be made to assure an adequate supply. And as demand is set to rise, a "comprehensive legal framework as well as advanced technologies have

to be established in order to provide a sustainable supply of mineral resources in the future.” (Tiess and Kriss, 2011: 63)

## **2.2 Responsible mining principles, policies and land use planning**

Some scholars argue that sustainable environmental mining is an oxymoron, i.e. inherently contradictory, as the extraction and selling of a non-renewable resource is clearly unsustainable (Mudd 2007). Others argue that mining is sustainable by considering how mineral resources are shifted between economic sectors and are converted into new forms (e.g. the jewelry industry). However, the concept of sustainability in mining is rather different to sustainability in ecosystems or in the extraction of other natural resources (Solar et al. 2009).

Here we argue for the first-mentioned understanding of sustainability in the mining sector. Therefore, by definition, the extraction of non-renewable resources cannot be sustainable. The focus of the discussion has to be reoriented towards “responsible mining” and to how mining projects can contribute to sustainable development. This approach to sustainability implies a “conceptual shift from a singular analysis on mitigation and impacts to a more comprehensive analysis that looks at the wider contribution of the industry and its products.” (ICCM 2012:5)

There are numerous references to environmentally sustainable mining (green or low carbon extraction and processing of minerals), including issues such as protection, transportation and land reclamation. However, the social costs of development and production as well as transparency are “usually not mentioned” (European Commission – DG Enterprise and Industry 2010). In this context, D’Esposito (2000:1) states that: “to date, too much of industry discussion and debate with regard to sustainability and responsible mining practices has focused on the technical issues of how to mine rather than the larger issues of whether, and where to mine.”

At the Johannesburg World Summit on Sustainable Development of 2002, countries with mining interests decided to demonstrate that the sector can be a significant driver of development. They drafted Paragraph 46 of the Implementation Plan, which recognizes the contribution of mining to sustainable development while identifying at the same time priorities to “ensure and enhance the potential contribution of mining to sustainable development” (Intergovernmental Forum on Mining Minerals, Metals and Sustainable Development 2013).

In practice, mining in a “sustainable way” is linked with the recognition of a set of management principles or practices assuring responsible mining. This is addressed by a number of researchers and institutions, e.g. Wagner et al. (2006), Hendrix (2006), Rajaram et al. (2005), Langer and Tucker (2003), and the European Union (2000). Extraction activities are influenced by other competing land uses such as agriculture, urban development, nature protection and conservation, etc. For this reason, it is necessary:

- To address negative environmental, economic, health/social impacts as well as the benefits of mining throughout the life cycle;
- To reduce inputs such as water and energy, to avoid disruption to landscapes, to diminish outputs such as waste, and to restore environmental functions after mining;
- To foster cleaner extraction and production technologies through the provision of financial, technical and capacity-building support to less developed economies;
- To enhance stakeholders’ participation (whether the government, industry, the general public or non-governmental organizations); they have to resolve conflicts and fully assume specific responsibilities.

The complex challenges to meeting these principles depend on a range of factors such as the administrative structure, the scale of production, the legislation and its implementation.

### **2.2.1 Mineral Policies and Strategies**

Closely linked to the principles of sustainable mining is the question of implementing comprehensive and sustainable national mineral policies and strategies, in other words the implementation of the principles mentioned above. The European Commission – DG Enterprise and Industry (2010:8) defines a National Mineral Policy as “a clear statement of agreed objectives for the management of mineral resources which aim to ensure their supply to meet the needs for those minerals.” The main elements which may define a sustainability-oriented mineral policy are (cf. EU - Enterprise Industry 2010:7; University of Leoben 2010):

- To facilitate the transformation of natural mineral capital into built physical, economic, environmental or social capital of equal or greater value;
- To ensure that environmental and negative social impacts of mining are minimized and their costs incorporated into production functions;
- To account for minerals properly in national statistics;
- To promote transparency and information sharing;
- To reconsider the allocation of rights and the availability of resources across generations;
- To address benefit-risk trade-offs from the perspective of multiple stakeholders and to create contingency plans that will ameliorate the effects of mining market booms and busts; and
- To be correlated and consistent with other governmental policies.

In spite of their relevance, many countries do not possess mining policies. Where these are in place, they do not recognize the basic type of minerals broader type of minerals and the different stages of the mining cycle. For instance, according to a recent EU Report (2014), not all member states have national mineral policies in place, and those which have been adopted are not necessarily aligned with sectoral needs and priorities.

### **2.2.2 Mineral Land Use Planning and Regulations**

Land use planning can be defined as “the systematic assessment of land and water potential, alternatives patterns of land use and economic and social condition, for the purpose of selecting and adopting land use options which are the most beneficial to land users without degrading the resources or the environment, together with the selection and implementation of measures most likely to encourage such land uses.” (FAO 1993)

Most countries delegate the implementation of mining policy issues to lower tiers of government, such as land use planning by regions or municipalities (Wagner et al. 2006). Based on a study made by the European Commission – DG Enterprise and Industry (2010:9), the main elements of a comprehensive land use policy for mineral resources are:

- Geological knowledge of mineral distribution;
- A method for the identification of mineral resources (quality and quantity), and
- A means by which this information can be translated into a spatial plan (especially relevant for construction materials);
- A method for estimating the long-term demand for the minerals as well as recognition of the contribution of recycled materials;
- Protection of actual and potential mineral resources, and avoidance of improper land use and/or sterilization of mineral resources;

- Provision of clear orientations for the access and protection of mineral deposits.

In practice, at least among EU member states, “mineral issues are often allocated a lower priority in land use planning compared to other issues such as environment protection, nature conservation and water protection” (Wagner et al. 2006:615). The respective set of regulations (Mineral Acts) affecting the mining cycle has to cover all types of minerals as well as be clear and understandable regarding the set of necessary procedures to get authorization for mineral prospecting, exploration and extraction. Finally, regarding legislation, almost all EU member states already have statutes governing mineral rights, licensing for exploration and exploitation as well as the monitoring and supervision of mine closure (Wagner et al. 2006).

### **2.3 Responsible Management of Mining Aggregates**

The debate on sustainable mining is even more intensive regarding the extraction of aggregates, as this is a crucial resource for the long-term development of countries. On the one hand, from an “ecocentrist” perspective (Drew et al. 2002), it is argued that aggregates have to be protected as a geological product created over millions of years, and yet they are “currently extracted at a rate far greater than their renewal” (UNEP 2014:1). Some scholars view the depletion of aggregate deposits as a minor problem when weighed against the environmental impacts associated with the extraction, processing and transportation of materials (McEvoy et al. 2004; Bahn-Walkowiak et al. 2012:2). From this perspective, aggregate extraction is considered a locally undesirable land use (LULU) and a source of conflict due to the environmentally damaging impact.

From an “anthropocentric” (Drew et al. 2002) point of view, however, aggregates are seen as an essential component of economic development, necessary to promote and provide societal benefits (McEvoy et al. 2004; West and Cho 2006). Mining is encouraged and environmental problems are acknowledged and identified before mining activities begin.

To promote the responsible management of aggregates, it is vital to recognize the “complex” character of the industry (Shields and Solar 2004 in Langer 2009), represented by the following aspects:

1. Resources are not abundant (University of Leoben 2010). While geology dictates the location of minerals, other factors such as quality/quantity and environmental considerations might limit access (Wrighton et al. 2014).
2. The quality and quantity of aggregate deposits are key factors behind the long-term planning perspective of companies to ensure the supply of materials and to obtain exploration and mining licenses (Wagner et al. 2006).
3. Since aggregates are not an end product, the success of the sector is determined by the activities of downstream industries such as cement and concrete production. Thus, the market is highly affected by recession in the construction market as “consumer demand has to pick up before new orders for plant and machinery are made” (Bleischwitz and Bahn-Walkowiak 2006:8).
4. Legal and planning instruments are additional location factors to be considered. New legislation and a growing green lobby are making the global mining of new resources “difficult, time consuming and costly with no guarantee of success” (Lusty and Pilegis 2012).
5. Access to aggregate deposits is becoming more difficult to obtain because of competing land uses (Tiess and Kriz 2011). In countries with weak (such as Vietnam) or no land use regulations, illegal extraction activities proliferate near big cities to minimize transport costs. Therefore, to

the provision of access to resources is a “key, fundamental and critical issue” (Tiess and Kriz 2011: 63).

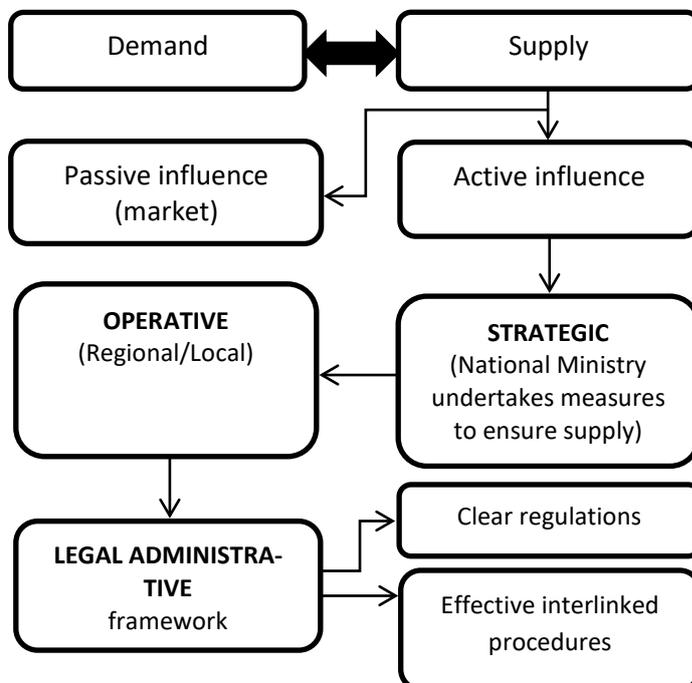
6. Prices are extremely sensitive to location because minerals are bulky with a low unit-value (Poulin et. al 1994). Thus, the transportation of aggregates to a construction site can add significantly to the final cost of the product.
7. Conflicts frequently arise between regional needs and local opposition to extraction activities due to their negative impacts. Such conflicts are recognized in the literature as the “dispersed benefit riddle” (Dunn 1983 in Langer et al. 2005).
8. While the recycling and substitution of materials is a reality in many developed countries, in others it will take years to implement these processes.

### 2.3.1 Planning Policies and Strategies on Aggregates

A national mineral policy on aggregates is defined as all governmental operations aimed at influencing the predicted medium- and long-term supply and demand of aggregates within a territory (University of Leoben 2010). Such mineral planning policies (i.e. the instrument to ensure that there is a sufficient stock of accessible aggregates) are part of a mineral policy framework (Tiess 2010 in University of Leoben 2010). Accordingly, and as a reaction to NIMBY (not-in-my-backyard) concerns, three issues must be tackled by a national aggregates policy (University of Leoben 2010):

- To raise awareness of the importance of mining aggregates;
- To consider the predicted medium- to long-term demand and the need to access resources;
- To (environmentally and socially) assess the exploration and development of extractive activities.

Figure 2 National Mineral Policy for aggregates



Source: Tiess 2010

As Figure 2 shows, mineral planning for aggregates based on land use management is first made at a national level (strategic planning) and then at the operative level (regional planning). At the strategic level, it is recommended that “the spatial and temporal priorities for aggregates areas with regard to economic/policy criteria need to be defined.” (University of Leoben report 2010:19)

Although many countries follow different priorities for the strategic management of aggregates, Wagner et al. (2006) stress that in many cases the emphasis is on environmental protection through the promotion of a reduced use of minerals and the recycling of materials (e.g. Sweden and The Netherlands). Drew et al. (2002: 19) summarize this concern, arguing that “ironically, the utility created for mankind by the use of natural aggregate is rarely compared favorably with the environmental impacts of mining it.” Furthermore, and according to the report published by the University of Leoben (2010: 7), the European industry has made significant progress in the environmental management of aggregate extraction, now being considered a “recognized leader in biodiversity”.

At the strategic level, very few mineral policies recognize the necessity of preserving future mining areas at a regional or local level. This is a critical issue in the discussion of aggregates, as most mineral policies do not consider construction minerals (sand, gravel and stones) to be of national high importance, i.e. critical raw materials<sup>1</sup>. For instance, while Sweden declares different types of mineral deposits as being of national interest and protects aggregates from being sterilized by other land use developments, Austria has developed a plan for raw materials whose main objective is to protect access to mineral deposits (Wagner et al. 2006). In England, the Minerals Planning Statement 1 (MPS1) of 2006 states that: “it is essential that there is an adequate and steady supply of material to provide the infrastructure, buildings and goods that society, industry and the economy needs, but this provision is made in accordance with the principles of sustainable development.” (Department for Communities and Local Government 2006: 3)

The European Aggregates Association (UEPG) has long criticized the negligence of the EU in safeguarding aggregate deposits for future generations and has urged the various EU institutions to develop a comprehensive European Raw Material Strategy to ensure a sustainable and long-term supply of aggregates. In 2008 the EU Commission recognized the importance of raw material by establishing the Raw Material Initiative, which covers aggregates for construction, and whose main idea is to develop a strategy recognizing aggregates as an essential component of the material inputs into the European construction industry. The document consists of three pillars (EU 2008):

- Fair and sustainable supply of raw material to global markets;
- Sustainable supply of raw materials within the EU; and
- Resource efficiency and supply of “secondary raw materials” through recycling.

One of the main obstacles to the development of policies and strategies concerning aggregates is that they are not properly accounted for in statistics, mainly because aggregates do not fall under the responsibility of one single authority. However, solid data is essential for determining the importance of the sector in terms of production and consumption at the national, regional and local level.

### **2.3.2 Aggregates and Land Use Planning**

Land use planning refers to the process by which society, through its institutions, decides where different socioeconomic activities should take place. “At the core of land use planning is the joint balancing of competing land uses by all stakeholders (users and those affected from the (changes in) land uses) and the joint identification of those uses for which the highest consensus can be achieved – ideally for the purpose of sustainability.” (GIZ 2012)

Thus, land use plans are required to identify sites where aggregate extraction is permitted, possibly under certain conditions, and where in principle it is prohibited. This process is recognized as the

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<sup>1</sup> Critical raw materials are defined as those with a high supply risk and high economic importance (EU 2014).

operative level of a mining policy, and is expected to be interrelated with the strategic level where the priorities or principles for extracting minerals are specified (Figure 1).

At the operative level, it is vital to take account of geological information “into the land use databases at an early stage to ensure that mineral issues are considered in all land use planning decisions” (University of Leoben, 2010:19). However, not all countries conduct state-led exploration. For instance, the Geological Survey of Sweden, a government authority, provides geological information to companies carrying out exploration. When companies return the areas they were allowed to explore without conducting extraction activities, more detailed information enters into the geological database.<sup>2</sup>

According to the report by the University of Leoben (2010), Germany, Denmark and Sweden all have land use planning laws at national level that consider minerals and oblige all administrative levels to prepare land use plans. However, the specific designation of aggregate sites differs between countries. In Cyprus quarrying zones are designated at the national level, in Greece at the provincial level, while in Germany and Italy quarry zones are designated by regions. For example, Emilia Romagna prepares a Mineral Extraction Plan for aggregates interpreted at a detailed level by the Municipal Extraction Activities Plan (University of Leoben 2010).

In other countries access to aggregates is regulated by the demand for construction material, i.e. at the request of mining companies for the designation of extraction sites. Accordingly, it is easy to find overlapping usages of non-designated deposit areas for other purposes. In addition, it is important to consider the fact that demand projections on aggregates can be inaccurate due to the dynamics of the construction industry.

One of the conflicts associated with land zoning and often mentioned by aggregate producers is that planning instruments do not ensure a balance between different uses and interests. Schulz 2011<sup>3</sup> argues that aggregates’ extraction sites are not designated by competent authorities in the same way as nature and water protection areas. In practice, this means that in Germany “regional spatial planning has the task of designating raw materials extraction areas only after considering predetermined nature and water protection areas. As a consequence, the extraction takes place where other interests play little or no role.” (Schultz 2011:24)

Nowadays, in more developed economies, urban consolidation and expansion, the growing number of protected natural areas, zoning restrictions and the problems associated with noise and dust are limiting access through sterilization. As a consequence, the discussion on aggregates is focused on the fact that access to mining minerals is increasingly limited. According to the University of Leoben report (2010), this can be attributed to the lack of land use management principles (strategic perspective) related to aggregates rather than to geological conditions. Aggregate sterilization and encroachment have been well discussed and addressed in the United States and the United Kingdom (Langer 2000; Mineral Industry Organization 2011) through research on underground mining.

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<sup>2</sup> Webpage of the Geological Service of Sweden

<sup>3</sup> Schulz, M. 2011. Reconciling Mineral Planning with Natura 2000 in Germany. Presentation of the BKS Bundesverband der Deutschen Kies-und Sandindustrie e.V. at the 11<sup>th</sup> European Minerals Forum “The EU Raw Materials Initiative – What next?”

### 2.3.3 Legal and Administrative Regulations on Aggregate Extraction

A mining license or permit is required to explore, explode and process sand, gravel and rocks. The process should allocate aggregates and balance the different stakeholders' interests while protecting the rights and interests of entrepreneurs, communities and individuals. The procedures must encompass the entire cycle and duration of a mining project (including closure). An effective system is characterized by a clear legal and regulatory framework on how licenses are issued, monitored and terminated, including well-defined institutional responsibilities and procedures based on established criteria (Venugopal 2014). Moreover, the set of procedures involved should be linked with national policies and with land use plans (Figure 1).

In general, the system of aggregate mining licensing has two main frameworks, namely legislative and administrative (institutional). The way governments organize and manage the process determines the access to aggregates and may contribute positively or negatively to local socio-economic and environmental development (World Bank Group 2009).

Regarding the legal framework, governments usually have a mining law in place to establish state ownership of minerals (in some cases this is defined constitutionally). The law contains the government's responsibilities and authorities "over the design of the procedures by which licensing takes place and for the administration of the mineral licensing system in a timely, efficient and transparent manner" (Venugopal 2014: 2). Procedures for extension, termination or revocation of licenses and taxation measures are also included. Over the last decade, many legal frameworks have incorporated the submission of integrated social, economic and environmental assessments (describing risks and impacts together with mitigation or management measures) and ways of facilitating public participation at all stages of the assessment. While the legal framework is crucial and necessary, there is considerable variation between countries regarding the handling of permits and what they cover.

With respect to the administrative framework, it is important to understand the different levels involved in getting a permit for a quarry such as national mining authorities, geological agencies, regional governments, local authorities, environmental agencies, etc. Alongside the problems arising from overlapping competences, inconsistent as well as lengthy and complex bureaucracy, there is an ongoing discussion regarding the decentralization of the process for granting licenses. This discussion falls within the framework of transferring natural resource management rights to regional or local levels. Decentralization can include the power to decide local land uses, assign exploration and mining licenses or to collect and manage fees and taxes in connection with the extraction.

Regarding the administration of licenses, Venugopal (2014: 1) states that decentralization "is driven by the wish to improve development outcomes by letting the people directly affected by extractive projects make decisions about the exploration and development of mineral deposits. However, the process can raise unforeseen political, fiscal and administrative challenges."

For instance, Labonne 1999 (in Holden and Jacobson 2006) mentions that sometimes the priorities of local governments (to prevent large-scale mining) may conflict with those of central governments (who may have adopted a mining-based development paradigm).

Additional conflicts can arise between the interest of entrepreneurs, local politicians and/or communities. In Germany, representatives of aggregate producers<sup>4</sup> argue that the decision to transfer legislative power from the regional to the local level in parts of the country was a bad one. When the process takes place at the local level, municipal politicians rather than experts are allowed to decide if an operator is granted a permit based on the regional land use plan. According to the president of the Aggregates' Association, the final decisions should be taken at a higher level, far removed from local politics. Furthermore, local citizens often reject applications for quarries or are even unwilling to open to discuss such projects due to a strong NIMBY factor, which is in turn exacerbated by poor environmental and social practices.

Finally, the University of Leoben (2010) analyzed and compared the administrative procedures for obtaining mining licenses among European countries based on four indicators of effectiveness: land use planning orientation, use of a "one stop-shop" approach, a multi-authority parallel assessment and a standard application form. Results show the mining license systems to be (in most cases) excessively complex and slow, with many licenses too limited in time to justify investment.

From a sustainability perspective, governments require a set of regulations and guidelines to manage social and environmental impacts and to maximize socioeconomic benefits from aggregate mining activities. Additionally, a responsible and accountable institutional capacity needs to be in place to manage the decision-making process for designating sites, to approve licenses for extraction as well as for ongoing monitoring and enforcement.

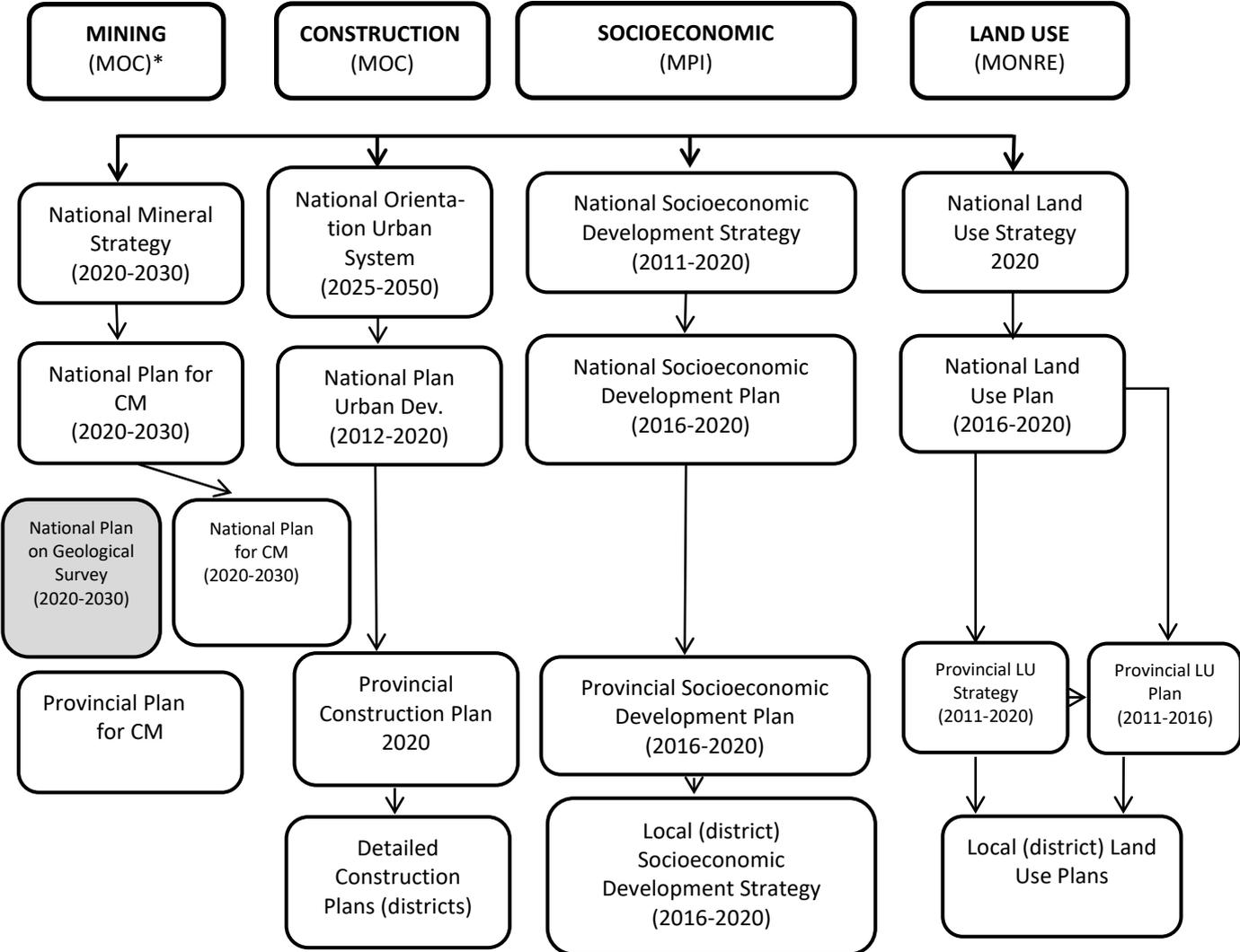
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<sup>4</sup> Raimo Bengler, Chief Executive of the Wbn-baustoffe and Michael Schulz, President of the BKS Bundesverband der Deutschen Kies-und Sandindustrie e.V. The 11<sup>th</sup> European Minerals Forum "The EU Raw Materials Initiative – What next?"

### 3. The influence of socioeconomic development and sectoral planning on aggregate mining in Vietnam

Two types of planning are applied in Vietnam, namely socioeconomic and sectoral planning. Socioeconomic planning, which is rather centralized and hierarchical, is aimed at promoting and regulating the country’s overall socioeconomic development. The set of instruments includes different spatial and temporal scales (Table 1). All the socioeconomic planning documents in different sectors and at different special levels reinforce the message of industrialization and modernization expressed by the national plans or strategies and some actions plans (Figure 3). Master sectoral plans and strategies (e.g. for mineral extraction, urban construction, land use, transportation, technical infrastructure, water supply and drainage, housing, etc.) are prepared by the departments and agencies responsible for each technical sector related departments and agencies.

Figure 3: Socioeconomic and sectoral planning related to the extraction of aggregates



\* The Ministry of Construction (MOC) assumes a planning responsibility in the case of minerals used as construction materials. Mineral planning for the rest of minerals is conducted by the Ministry of Natural Resources (MONRE). MONRE is also responsible for related land use issues. The Ministry of Planning and Investment (MPI) is responsible for socioeconomic planning.

In the case of the Hanoi Capital Region (Figure 1), the Provincial Governmental plans have to be approved by a higher authority before they can be implemented. Main planning instruments include socioeconomic, sectoral (mineral and construction) and land use plans, all applicable at districts levels. These are classified as medium term (5 years) or short term plans (annual). In the following, we discuss the four main forms of planning indicated in Figure 3.

### 3.1 Socioeconomic development planning

The three main instruments used to shape the socioeconomic development of Vietnam and its different provinces are: (a) the National Socioeconomic Development Strategy, (b) the National Socioeconomic Development Plan, and (c) the Provincial Socioeconomic Development Plan. The first two drafting proposals are the responsibility of the Ministry of Planning and Investment (MPI) while the third is led by the Provincial People's Committee.

Table 1: Socioeconomic development planning documents that affect aggregate extraction in Hoa Binh Province

| Document  | Characteristics  | Approved by                             | Drafting body  | Document              |
|---|--|---|--|-----------------------|
| Socioeconomic Development Strategy 2011-2020                          | National 10-year political vision for long term development. Set priorities for national, sectoral and regional development, 2011  | Communist Party                         | Development Strategy Institute of MPI                    |                       |
| Socioeconomic Development Plan 2016-2020                              | National 5-year plan. Concretizes the development strategy and sectoral master plan, 2011  | National Assembly                       | MPI  |                       |
| Master Plan on Socioeconomic development of Hanoi City 2020-2030      | Regional 10-year political vision for long term development. Set priorities for regional provincial and sectoral development, 2011 | Prime Minister                          | Hanoi Provincial Department of MPI                       | Decision: 1081/QD-TTg |
| Master Plan on Socioeconomic Development of Hoa Binh Province to 2020 | Provincial 10-year plan. Sets target programs for provinces, 2013  | Prime Minister                          | MPI and Provincial Department of Planning and Investment | Decision: 917/QD-TTg  |
| Local Master Plan (districts) on Socioeconomic Development to 2020    | Local 5-year plan. Sets target programs for districts  | People's Committee of Hoa Binh Province | Provincial Department of Planning and Investment         |                       |

#### 3.1.1 Socioeconomic Development Strategy (SEDS)

Approved by the Communist Party, the SEDS defines the goals to be attained within a 10-year period. The instrument serves as the basis for the formulation of sectoral and local development plans like such as for mining, transportation, energy, telecommunication and tourism. The general objective of the strategy is to ensure that the country has a modern, industrial-based economy by 2020 along with socio-political stability, agreement, democracy and discipline; people's physical and spiritual life is to be improved; the country's independence and territorial unification are to be firmly maintained; Vietnam's position in the international arena is to be continually improved; finally, a strong foundation is created for higher development in the next period (Vietnam Government 2011).

The Strategy gives particular attention to structural reforms, environmental sustainability, social equity and emerging issues related to macroeconomic stability. It defines three crucial areas of development (World Bank 2016):

- I. Promoting human resources/skills development (mainly for modern industry and innovation);
- II. Improving market institutions;
- III. Infrastructure development.

It is important to mention some of the specific objectives regarding economic and environmental development which may, by influencing strategic instruments, affect the extraction of mineral aggregates. These are:

- To promote economic development with environmental protection and green economy development.
- To foster the economic structure transition focusing on restructuring manufacturing and service industries attached to economic zones.
- To quickly develop infrastructure, especially transportation infrastructure.
- To develop sustainable regions and newly built-up urban areas.
- Viewing science and technology development as the key motivation for the process of fast and sustainable development.
- To improve environment quality. 100% of new business and manufacturing facilities will apply clean technology or be equipped with devices that help reduce pollution and waste treatment, and more than 80% of existing business and manufacture facilities shall meet environmental standards.
- Urban areas of type 4 and above and all industrial zones and export processing zones will have a centralized system for water treatment.

The SEDS and related plans are operationalized by sectoral plans prepared by all ministries. Although not clearly specified in its remit, the MPI has a leading role in conducting and influencing sectoral and provincial plans. Fosberg (2007 in Tan 2012: 14) points out that: “the responsible departments in the MPI can even push their will through despite and against the sectoral ministries, unfortunately to the detriment of sectors such as health, education, care of the elderly and the environment, which receive little attention at these high levels of policy-making.”

### **3.1.2 Socioeconomic Development Plan (SEDP)**

The 5-year SEDP, which is based on the SEDS for 2011-2020, lays out the industrialization pathway and is committed to the United Nations’ Sustainable Development Goals. The plan provides the basis for the preparation and approval of annual plans and instruments for determining development investment priorities. It serves as a basis for the preparation of provincial and city development plans.

The SEDP (2016-2020) acknowledges the slow progress in the reform priorities of the previous version and emphasizes the need to accelerate reforms in the new period to achieve the objectives of the SEDS. The current SEDP (2016-2020) sets out 21 macroeconomic, social and environmental targets (Table 2).

### **3.1.3 Master Plan on Socioeconomic Development for Hanoi City 2020-2030**

The Hanoi Capital Region Master Plan on Socioeconomic Development is specified as a sub-region in the SED Master Plan of the Northern Key Economic Region. In 2013 the government assigned the Institute for Regional Urban Development Planning (IAU, Ile de France) to undertake socioeconomic development modeling, regional development scenarios and transportation planning for the Capital Region. Here we analyze the Socioeconomic Plan for Hanoi City (Decision 1081/QD-TTg), which was approved in 2011. The plan for the capital city has the following objectives:

1. To utilize all resources to promote a fast and sustainable socio-economic development that exploits the city's potential and advantages.
2. To combine economic development and urban construction with the development of social/educational infrastructure and health/cultural facilities as well as the promotion of social progress, justice and environmental protection; to consider economic development as the basic task, urban construction as the central task and social development as the important task; to develop and raise the quality of human resources to ensure fast, effective and sustainable economic development.
3. To prioritize investment in industries and sectors that creates conditions for development, and to concentrate investment in sectors with competitive advantages such as tourism, services and high-tech industries.
4. To promote sustainability by combining socio-economic development with the conservation of natural resources and environmental protection.
5. To present economic, social, infrastructure and environmental protection objectives associated with specific targets (Table 3).

Table 2: Selected targets of the Socioeconomic Development Plan 2016-2020 for Vietnam

| Indicator                                       | Target for 2016-2020                     |
|---|--|
| Average GDP growth                              | 6.5-7.0% p.a.                            |
| Annual GDP per capita                           | 3,200-3,500 USD                          |
| Industry, Construction & Service's share of GDP | 85%                                      |
| Total average social investment over 5 years    | 32-34% GDP                               |
| Budget deficit by 2020                          | 4% GDP                                   |
| Urbanization rate by 2020                       | 38-40%                                   |
| Share of agricultural workforce by 2020         | 40%                                      |
| Urban unemployment                              | < 4%                                     |
| Reduction in poverty rate                       | 1-1.5% p.a.                              |
| Forest coverage                                 | 42%                                      |
| Access to clean water                           | 90% in rural areas<br>95% in urban areas |

Source: Vietnam SEDP 2016-2020

Table 3: Selected targets of the Socioeconomic Development Plan 2016 -2020 for Hanoi City

| Indicator                             | Target for 2020  | Target for 2030      |
|---------------------------------------|------------------|----------------------|
| Average GDP Growth                    | 11-12% p.a.      | 9.5-10% p.a.         |
| Annual GDP per capita                 | 7,000-37,500 USD | 16,000-17,000 USD    |
| Industry's share of GDP               | 55.5-56.6%       |                      |
| Construction & Service's share of GDP | 41-42%           |                      |
| Agriculture's share of GDP            | 2-2.5%           |                      |
| Population                            | 7.9-8 million    | 9.2 million          |
| Urbanization rate                     | 58-60%           | 65-68%               |
| Housing area/person                   |                  | 25-30 m <sup>2</sup> |
| Green area/person                     |                  | 10-12 m <sup>2</sup> |

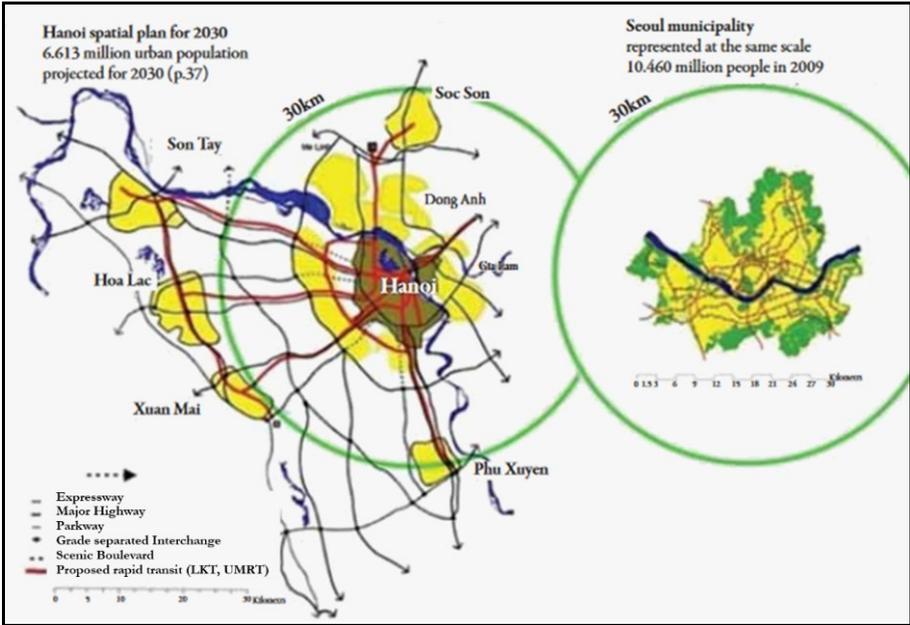
Source: Hanoi City Socioeconomic Development Plan

The specific orientations of the Hanoi Socioeconomic Plan include the shaping of the urban space according to the cluster model of urban centers, including central and satellite centers, townships and rural areas connected by belt roads combined with radial trunk roads and linked to regional and national transport networks. The city center will be separated from satellite urban centers and townships by green corridors (Figure 4). The core urban center will accommodate the head offices of central agencies as well as those of the Communist Party, governmental and other national organizations; foreign diplomatic missions and international organizations; trade, commercial, financial, insurance and security service establishments; leading research institutes; and headquarters of economic groups and major enterprises.

Five urban satellite centers (Hoa Lac, Son Tay, Xuan Mai, Phu Xuyen and Soc Son) will operate independently to support and share the training, industrial, services, housing and other functions of the central urban center. Housing projects and infrastructure work are already underway and will continue through 2030. These urban islands are intended to help Hanoi become a more powerful center of urban economic activity. Yet according to an article published in Vietnam News back in 2012, few people or businesses have committed to moving due to insufficient investment and rising infrastructure costs<sup>5</sup>.

Townships will be newly built according to the model of low-density eco-urban centers as well as from existing district capitals such as Phung, Tay Dang, Lien Quan, Kim Bai, Van Dinh, Dai Nghia and Thuong Tin. Suburban areas are to form greenbelts associated with the development of large eco-parks. The proposal includes developing models of high-tech agricultural farms already implemented in Gia Lam, Dong Anh and Me Linh; to form large eco-tourist resorts in Ba Vi, Soc Son and Huong Son-Quan Son areas; to upgrade and expand the system of infrastructure work, creating useful infrastructural links between the inner city and its suburbs, concentrating on transport, water supply and drainage as well as waste treatment; finally, to improve housing conditions in suburban areas.

Figure 4: Model of clusters according to the Proposed Regional Highway Network for the Hanoi Capital Region 2030 in comparison to the compact metropolitan development in Seoul



Source: World Bank 2011

<sup>5</sup> "New Cities fail to lure investors". Available online at: <http://vietnamnews.vn/Economy/219501/new-cities-fail-to-lure-investors.html>

### 3.1.4 Master Plan on Socioeconomic Development of Hoa Binh Province through 2020<sup>6</sup>

The Socioeconomic Plan of Hoa Binh Province was approved in 2013 (Decision 917/QD-TTg). Based on the socioeconomic goals of the Master Plan, the People's Committee of Hoa Binh province assumes responsibility for and coordinates (with related ministries and sectors) the formulation, approval and implementation of District Socioeconomic Master Plans, Construction Master Plans and Sectoral Master Plans.

The general objective of the plan is to strive for fast and sustainable economic development in order to turn Hoa Binh into a province which reaches the average development level of the whole country with a gradually modernized economic and social infrastructure network and a relatively developed urban system. Local people's lives are to be improved, the environment protected, the special cultural identities of ethnic groups preserved and promoted, and national defense and security assured.

The province's sectoral orientations concentrate on the following areas<sup>7</sup>:

1. Agriculture, forestry and fisheries: to build a highly intensive, specialized and sustainable agricultural sector (rice, sugarcane, tea, groundnut, soybean, fruit trees); to develop animal husbandry on an industrial scale; to implement the program on forest protection and sustainable development; to apply advances in aquaculture technologies for increasing productivity and efficiency.
2. Industry and construction: to accelerate industrial growth toward modernization in association with environmental protection; to concentrate resources on developing industries that exploit the country's natural resources (construction material production as well as agricultural and forest product processing) along with labor and market advantages (electronics, textiles, assembly of automobile and motorcycle components, production of liquor, beer and beverages).
3. Services: to identify types of service and commodities in which the Province is competitive; to complete infrastructure and technical systems serving trade along with the development of urban and rural markets, supermarkets and trade centers; to develop tourism in accordance with the conservation and promotion of cultural identities of ethnic groups.
4. Social sector: to continue building education centers; to improve the physical foundations of hospitals; to build facilities for physical training and sport;
5. Infrastructure: to build a complete and modern infrastructure system (upgrade national highway 6, build Hoa Lac-Hoa Binh city road, several new roads and bridges); to upgrade power grids to ensure an interrupted supply of electricity; to invest in power supply networks for industrial parks; to upgrade existing irrigation works and build new ones; to build and upgrade rainwater and wastewater drainage systems in Hoa Binh City, Luong Son and other urban centers in the city; to efficiently use and exploit water and mineral resources to economic benefit; to intensify the scrutinization and certification of environmental protection work and measures before officially commissioning the projects in accordance with law.

The Hoa Binh Socioeconomic Master Plan aims to accelerate urbanization by upgrading<sup>8</sup> and expanding a number of existing urban centers, by building new urban centers in association with trade centers and transport hubs as well as by developing industrial parks and complexes in a long-term vision. Table 4 shows different macroeconomic, social and environmental targets discussed in the Provincial Master Plan.

<sup>6</sup> English version available online at: <https://luatminhkhue.vn/LMK/attachments/8/42466/917-QD-TTg.pdf>

<sup>7</sup> Selected goals are highlighted

<sup>8</sup> Upgrade Hoa Binh City to center grade II, Luong Son to center grade IV and a number of towns to grade V (Table 6)

Table 4: Selected targets of the Socioeconomic Development Plan 2016-2020 for Hoa Binh province

| Indicator  | Target for 2016-2020                     |
|--|--|
| Average GDP Growth   | 12.0% p.a.                               |
| Including hydropower plant                                     | 9.6% p.a.                                |
| Share of agriculture, forestry and fisheries workforce by 2020 | 15.8%                                    |
| Share of industrial and construction workforce by 2020         | 46.8%                                    |
| Services workforce by 2020                                     | 37.4%                                    |
| Population by 2020   | 870,500                                  |
| Rate of poor households by 2020 (poverty line)                 | Below 4%                                 |
| Households with electricity by 2020                            | 99%                                      |
| Forest coverage by 2020  | 46%                                      |
| Establishments treating waste according to standards by 2020   | 100%                                     |
| Garbage collection and treatment by 2020                       | 100%                                     |
| Reduction in poverty rate                                      | 1-1.5% p.a.                              |
| Hazardous waste treated  | 85%                                      |
| Hospital waste treated   | 95-100%                                  |
| Forest coverage  | 42%                                      |
| Access to clean water  | 90% in rural areas<br>95% in urban areas |

Source: Hoa Binh Socioeconomic Master Plan Decision 917/QD-TTg

The Master Plan divides the province into three sub-areas (Figure 5) to implement and operationalize sectoral strategies and objectives:

- Subarea 1      Hoa Binh City, Ky Son, Luong Son and Lac Thuy districts: hub of socioeconomic development, investment focus on urban, industrial, service and trade development.
- Subarea 2      Kim Boi, Lac Thuy, Yen Thuy and Lac Son districts: trade, services and tourism as driving forces of development. Promote industrial parks and complexes along Ho Chi Minh road. Development of commodity agriculture in combination with small cottage industries (creation of products and services is home-based), traditional craft villages and rural trades.
- Subarea 3      Mai Chau, Da Bac, Tan Lac and Cao Phong districts: agriculture (sugar cane, oranges and tea) and forestry development in combination with the exploitation of aquatic products and tourism. Promote waterway transport, traditional trades and occupations in the subarea.

In 2012 the Provincial People's Committee issued Decision 55/QD-UBND on administrative and directive plans for the implementation of socioeconomic and budgetary tasks. The document focuses on the following aspects: curbing inflation; restructuring the economy; improving the business and investment environment as well as finding investment solutions; enhancing the quality of human resources; developing science and technology; developing industrial zones, urban zones and transport systems; ensuring the continued implementation of agricultural and rural development policies, programs and projects<sup>9</sup>.

<sup>9</sup> Interview with Mr. Bui Van Tinh, Chairman of Hoa Binh Provincial People's Committee published online by the Vietnam Chamber of Commerce and Industry. Available at: [http://vccinews.com/news\\_detail.asp?news\\_id=28046](http://vccinews.com/news_detail.asp?news_id=28046)

Figure 5: Socioeconomic Plan for Hoa Binh province: Development subareas



Source: elaborated based on Decision 917/QĐ-TTg, 2013

### 3.2 Construction (Urban) Planning

Urban planning (which in Vietnam is also referred to as urban development planning or urban construction planning) is an essential tool for the spatial allocation of land uses in cities and urban areas. The Ministry of Construction (MOC) is formally designated as the lead ministry on issues of urban development. Currently, spatial planning is divided into four linked categories (Construction Planning Law 2013), namely:

- a) Regional Planning (Section 2, Article 22), which is divided into: (i) interprovincial region; (ii) provincial region; (iii) inter-district region; (iv) district region; (v) special functional regions, (vi) regions along highways, and (vii) interprovincial economic corridors;
- b) Special Functional Area Planning (Section 3, Article 24), which is divided into: (i) economic zones: Hanoi Capital Region; Northern Coast; Northern Midland and Mountainous; North Central Coast; Central Highlands; Central Southern Coast; Key Central Economic Zone; Ho Chi Minh City; Mekong River Delta; (ii) industrial parks, export processing zones, high-tech parks; (iii) tourism and ecological zones; (iv) reservation zones; (v) historical-cultural-revolutionary zones; (vi) research-training zones, sport gymnastic areas; (vii) airport, seaport; (viii) technical infrastructure areas; (ix) other specific functional areas;
- c) Rural Planning is planned for rural municipalities and the rural population (Section 4, Article 29);

- d) Urban Planning (defined by the Law on Urban Planning Article 18), which is divided into (i) Regional Planning (General) targeted at centrally-controlled cities, prefecture-level cities, towns, townships and new urban centers; it identifies potential trends, resources and forces driving the development of a region and its urban and settlement system; (ii) Master Planning, which is targeted at areas within cities, towns and new urban centers; and (iii) Detailed Planning, which is targeted at areas in order to meet urban development and management requirements or construction investment needs.

All urban planning instruments are integrated with socio-economic planning and incorporate indicators of GDP, employment and technical infrastructure. Additionally, while all steps are intended to involve public participation, there is not much evidence of this. In practice, citizens are not involved in this process nor are they informed of the existence of these plans.

The Ministry of Construction is now working to review the Law on Urban Planning to match new regulations of the Law on Construction 2013. In the following sections, we introduce and describe in detail various urban (construction) planning instruments that affect the extraction of aggregates in Hoa Binh Province (Table 5).

Table 5: Urban planning documents that affect the extraction of aggregates in Hoa Binh Province

| Document  | Approved by          | Drafting body   | Document   |
|---|----------------------|---|--|
| National Planning Orientation for the development of Vietnam's Urban System in 2025 with a vision to 2050 | Prime Minister, 2009 | MOC, Urban Development Agency   | Decision: 445/QD-TTG<br>New version in preparation |
| National Program on Urban Development for the Period 2012-2020  | Prime Minister, 2012 | MOC, Urban Development Agency   | Decision: 1659/QD-TTg<br>1758/QD-TTg               |
| Construction Master Planning for Hanoi Capital Region to 2020 with a vision to 2050                       | Prime Minister, 2008 | MOC, Urban development Agency   | Decision: 490/QD-TTg                               |
| Construction Master Planning for Hoa Binh Province Region to 2020   | Prime Minister, 2012 | Provincial Department of Construction (DOC) with the assistance of the Vietnam Institute for Urban and Rural Planning | Decision: 1314/QD-UBND<br>1621/QD-UBND             |
| Detailed Construction Master Plan for Hoa Binh City to 2025   | People's Committee   | Provincial Department of Construction (DOC)   | Decision: 1354/QD-UBND                             |

### 3.2.1 National Planning orientation for the development of Vietnam's Urban System in 2025 with a vision to 2050

The National Construction Plan was approved by the Prime Minister in 2009 (Decision 445/QD-TTg). The Urban Development Agency (established in 2008) advises the minister on the formulation of the Strategic Planning for City System Development and the categorization of cities (Table 6). It provides directions, guidance and monitoring of the construction planning for cities and towns throughout the country. The strategic vision of the National Plan is "to achieve integration and sustainable development toward industrialization-modernization strategies in the postindustrial period, focusing on service and tourism development." The main objectives of the Plan are:

- To gradually develop Vietnam's urban system toward an urban network model;
- To develop synchronized and modern technical and social infrastructure; to create good urban living quality and environment; to develop advanced urban architecture with national identity; and

- To achieve a high position and level of competitiveness in socio-economic development at national, regional and international level.

The National Plan indicates specific targets for different issues:

a) Regarding urban population growth: urban population to reach about 35 million (38%) in 2015, 44 million (45%) by 2020 and 52 million (50%) by 2025.

b) Regarding the classification of urban settlements and management levels (Table 6): In 2015 the Vietnamese urban system is shaped by more than 870 centers of which two are central government cities (metropolitan municipalities); nine of Type I; 23 of Type II; 65 of Type III; 79 of type IV and 687 municipalities of Type V. In 2025 the Vietnamese urban system will have 1,000 agglomerations divided into 17 centers of Type I (especially metropolitan municipalities); 20 of Type II; 81 of Type III; 122 of Type IV and the rest corresponding to Type V (Table 6). Type V is the smallest urban type and constitutes the demarcation between urban and rural.

Table 6: Vietnam: Criteria and indicators for defining urban types

| Criteria/<br>Indicators      | Type I   | Type II  | Type III              | Type IV               | Type V                |
|------------------------------|--|--|-----------------------|-----------------------|-----------------------|
| <b>Population</b>            | a) > 1 million:<br>Central government-run city<br>b) 500,000:<br>Provincial city | c) 300,000 to 1 million<br>If class 2 is central government-run city, population should be more than 800,000 | d) 100,000 to 350,000 | e) 50,000 to 100,000  | f) > 4,000            |
| <b>Nonagricultural labor</b> | 85%  | 80%  | 70%                   | 70%                   | > 65%                 |
| <b>Population density</b>    | a) 12,000/km <sup>2</sup><br>b) 10,000/km <sup>2</sup>                           | 8,000/km <sup>2</sup> or 10,000/km <sup>2</sup> if the city is directly under central government control     | 6,000 km <sup>2</sup> | 4,000 km <sup>2</sup> | 2,000 km <sup>2</sup> |

Source: adapted from World Bank - Cities Alliance, 2011

c) Regarding demand for land for urban construction: In 2015 the demand for urban construction land is 335,000 hectares, accounting for 1.06% of the territory and corresponding to an average rate of 95 m<sup>2</sup> per person; in 2025 the country has 450,000 urban hectares, corresponding to 1.4% of the territory and equivalent to 85 m<sup>2</sup> per person.

d) Regarding urban infrastructure: (i) In cities of Types I and II, the proportion of land used with transportation infrastructure ranges between 20-26% of the total urban area; agglomerations of Type III or higher account for 15-20% of total urban land. In these centers, public transportation serves over 35% of the population in 2015 and over 50% in 2025. (ii) In 2015 over 80% of the Vietnamese urban population has access to water; in 2025 this will rise to over 90%; 100% of the population has access to electricity in 2015; over 80% of main streets are illuminated by 2025; municipal solid waste will be collected and processed to prescribed standards. (iii) The infrastructure of information and communication should flourish to meet the requirements of urban development and international economic integration. In 2015 over 80% of the urban population (Type III or higher) has access to internet, rising to 100% by 2025. (iv) All infrastructure targets must comply with the country's building codes and laws.

### 3.2.2 National Urban Development Program for 2012-2020

Decision No. 1659/QĐ-TTg of 2012 approved the National Urban Development Program for the period 2012-2020, describes specific objectives to 2015.

Regarding urban system and urban quality, targets are:

- The national urbanization rate shall reach 38%;
- The national urban system shall meet the socio-economic development requirements;
- Urban administrative management authorities shall be established place, in order to meet the development management requirements in two special cities, 195 urban localities of class I to IV and more than 640 urban localities of class V (Table 6);
- The floor space of the average urban-dwelling-house shall reach 26 m<sup>2</sup> per person and the proportion of permanent housing shall rise to 65%;
- The proportion of traffic land to land for urban construction in settlements Type I and II shall reach 15-20% and 15% or more in Types III to V. Public transportation covers 15-20% of the population in centers Type 1; 6-10% in centers Type II and III and 1-3% in centers type IV and V;
- Targets and standards for water, energy, solid waste rate collection, drainage supply and green space per person are described in detail.

Regarding urban system and urban quality, targets are:

- The national urbanization rate shall reach 45%;
- The national urban system shall meet the socio-economic development requirements;
- Urban administrative management authorities shall be established in order to meet the development management requirements in two special cities, 312 urban localities of class I to IV and more than 620 urban localities of class V (Table 6).

### 3.2.3 Hanoi Capital Region Plan 2020 with a vision 2050

The Ministry of Construction is responsible for drawing up a regional construction plan. The plan, which was approved in 2008 by Decision No. 490/QĐ-TTg of the Prime Minister, encompasses almost the entire administrative territories of Hanoi Capital Region, including Hoa Binh. This constitutes a total area of around 13,436 km<sup>2</sup> and a radius of influence of 100-150 km.

In the Construction Master Plan up to 2030, the population of Hanoi is forecast to grow to 7.44 million by 2020 and to around 9.5 million by 2030. The forecast vision for 2050 is 12.27 million. The region will develop into a multi-polar concentrated urban region with spatial links between Hanoi city and the surrounding provinces (including Hoa Binh), with provincial capital cities being the cores of the counterbalancing development area. The regions' development orientations are to promote the socio-economic development of provincial capital cities in order to activate their role and potential, in particular by developing their technical and social infrastructure systems, thereby reducing the overload pressure on Hanoi city.

The plan promotes the development of two major areas:

1. The core in the following three major sectors: urban area: The City of Hanoi will play a leading role in the region, accommodating largely political, administrative, cultural, commercial, financial, service and hi-tech centers, research institutes and creating a tourist center for the whole region and the country at large. The central areas will be developed

- The urban area to the south of Red River, which will be improved and expanded west-southwest of Hanoi city;
- The urban area to the north of Red River, which will form a new commercial-urban center and a national traffic hub on the Kunming-Ha Long economic corridor;

- The urban area to the east of Red River and the south of Duong River, which will provide residential houses linked with industrial, small and cottage industrial zones and commercial service centers.

## 2. Hanoi adjacent areas, including:

- Adjacent areas extending 25-30 km will have the function of supporting the development and expansion of the core urban area, also serving to strengthen links between the City of Hanoi and surrounding provinces. These areas will function as greenbelts to supply farm produce and foodstuffs to the capital. At the same time, small and cottage industries, traditional craft villages as well as cultural and ecological tourism will be developed in these areas.
- The counterbalancing development area extending 30-60 km will be formed from three smaller areas with provincial capitals as their development cores.
- The counterbalancing area to the west of Hanoi: Half of this area in Hoa Binh province is mountainous with the rest plains and diversified natural landscapes. The area has great potential for the development of tourist resorts and cultural villages, etc. as well as for the construction of major technical infrastructure.
- The counterbalancing area to the east and southeast of Hanoi: This area covers delta provinces linking the Red River delta with the northern coastal region, including Bac Ninh, Hung Yen, Hai Duong and Ha Nam. Lying on economic axes linking Hanoi with the northern seaports, it has potential for agricultural and industrial development.
- The counterbalancing area to the north and northeast of Hanoi: This area is mainly the half-mountainous and half-plain area in Vinh Phuc province to the north of Red River and along national highway 18. With vast extents of hills, this area has potential for the development of industrial and urban service zones.
- Regional and sub-regional cities, including Hai Duong, Vinh Yen and Hoa Binh cities, with Hai Duong city being a regional city and Bac Ninh, Hung Yen and Phu Ly being provincial capital cities. To develop provincial capital cities and locally-run cities in the direction of concentrated investment, it is necessary to ensure higher architectural quality and better urban and infrastructure service conditions. This will attract investment, develop the population, expanded the workforce and kickstart major central works in the region.
- Specialized urban areas, which are mainly new urban centers attached to training and hi-tech centers (Hoa Lac), industrial zones (Pho Noi, Dong Van, etc.), tourist sites (Son Tay, Sao Do-Chi Linh, Tam Dao, Luong Son, Quan Son, etc.) or commercial service and housing development zones (An Khanh, Me Linh, Van Giang, Tu Son, etc.).
- District-level urban areas and townships, which are medium- and small-sized industrial and agricultural and rural service centers.

By 2020 the urban construction land area will be around 111,500 hectares, including around 15,000 to 24,000 hectares for industrial construction, with an average per capita land use of 120 m<sup>2</sup>. The land area for construction of rural residential areas will be around 45,000-50,000 hectares.

By 2050 the urban construction land area will be around 172,800 hectares, including around 32,000-34,000 hectares for industrial construction, with an average per capita land use of 115 m<sup>2</sup>. The land area for construction of rural residential areas will be around 24,000-33,000 hectares.

Decision No. 1758/QĐ-TTg of 2012 introduces adjustments to the regional scope. Accordingly, the Plan includes Hanoi Capital and the nine provinces of Vinh Phuc, Bac Ninh, Hai Duong, Hung Yen, Ha Nam, Hoa Binh, Phu Tho, Thai Nguyen and Bac Giang (covering an additional three provinces of Phu Tho, Thai Nguyen and Bac Giang compared to the original Decision).

The drafting of Hanoi Capital Region includes 10 centrally-controlled cities/provinces: Ha Noi, Phu Tho, Vinh Phuc, Thai Nguyen, Bac Giang, Bac Ninh, Hai Duong, Hung Yen, Ha Nam and Hoa Binh. The extension of the city's boundary means that the Hanoi People's Committee now has jurisdiction over the geographical area proposed for urban expansion up to 2050. This reform facilitates the integration of spatial and transport policy, planning, development and investment. Hanoi's long term strategic urban planning and transport plans (Master Plans) were until recently the responsibility of the National Government, while detailed tactical and operational plans for land use and transport were the responsibility of the city and district governments.

### 3.2.4 Construction Master Planning for Hoa Binh Province Region to 2020

The Hoa Binh Provincial People's Committee issued Decision No. 1314/QD-UBND (dated 25 September 2012) on the approval of Hoa Binh area construction planning to 2020. The regional vision of the plan is to develop a region of economic and cultural importance with urban development and modern infrastructure. Table 7 shows the different targets specified by the Provincial Construction Plan.

Table 7: Selected targets for construction planning in the Hoa Binh province for the period 2015-2030

| Indicator                               | 2015           | 2020           | 2030             |
|---|----------------|----------------|------------------|
| Population                              | 850,000        | 910,000        | 1,000,200        |
| Urban population (%)                    | 36.5           | 47.3           | 55.9             |
| Rural population (%)                    | 63.5           | 52.7           | 44.1             |
| Land demand for urban construction (ha) | 6,000 to 6,500 | 7,700 to 8,000 | 11,000 to 11,500 |
| Land demand for rural construction (ha) |                | 4,500 to 4,800 | 4,000 to 4,500   |

Source: Construction Master Planning for Hoa Binh Province, 2012

The scope of the planning instrument are the following 11 districts: Lac Thuy, Kim Boi, Luong Son, Ky Son, Da Bac, Mai Chau, Cao Phong, Tan Lac, Lac Son, Yen Thuy and the city of Hoa Binh as the capital of the province (Figure 5).

The general orientation for economic regional development is to promote high-tech industries, cultural ecotourism, trade services, education and agriculture, forestry and fisheries in three main areas identified by the Provincial Socioeconomic Master Plan (Figure 2).

Regarding industrial development, the province has allocated 2,143 hectares for the development of eight Industrial Zones (IZ) and 16 Processing Zones (PZ). The targets for 2015 are:

- To complete and attract investment to Luong Son IZ (81 ha) and Nam Luon Song IZ (200 ha), both in Luong Son district;
- To develop a number of industrial clusters along the route connecting with Ho Chi Minh;
- To complete and attract investment to Thanh Ha IZ in Lac Thuy district (300 ha);
- To study the feasibility of building Dong Tam IZ in Lac Thuy District (300 ha).
- To study the feasibility of building Dong Tam IZ in Lac Thuy district and Dam Duong IZ in Lac Son district.

The targets for 2016-2020 are:

- To focus investment on developing ecotourism associated with cultural historical monuments, traditional villages, particularly in the following clusters: (i) international tourism: hydropower project and Hoa Binh reservoir, Kim Boi hot spring; Mai Chau Valley, resort Nang Luong; golf course Phuong Hoang, Trung Minh and Mong Hoa Phuc; (ii) Hoa Binh City Luong Son-Ky Son, Kim Boi, Mai Chau, Tan Lac and Lac Thuy; (iii) Intercity tourist routes: Hoa Binh City-Hanoi; Tuyen Hoa

Binh City - Moc Chau - Son La - Dien Bien - Lai Chau; Tuyen Hoa Binh City - Ninh Binh - Thanh Hoa - the southern provinces, and (iv) tourist routes around Da River and Reservoir.

Regarding urban development:

- Hoa Binh City is the administrative center as well as the political, economic, cultural, educational, science and technology hub. The goal is to accelerate the process of core-economic development of the province.
- Luong Son has the role of promoting economic development of the district. It is a hub for transportation, economic exchange, cultural and social activities; reach urban class IV in 2020.
- Mai Chau is a commercial-tourism center with the role of preserving cultural values and the natural landscape.
- Than Ha: located in the eastern sub-region of the province, this is a center of commercial and industrial services to be developed on the Ho Chi Minh route as well as Highway 21.
- Muong Khen: administrative, political, economic, cultural, educational, science and technology center. Its role is to promote economic and social development within Tan Lac district.
- Hang Tram: administrative, political, economic, cultural, education, science and technology center. Its role is to promote economic and social development within Yen Thuy district.

Table 8: Selected targets for urban areas in Hoa Binh province for the period 2020-2030

| Indicator                         | 2020             | 2030             |
|-----------------------------------|------------------|------------------|
| Population <b>Hoa Binh</b>        | 15,000 to 16,000 | 21,000 to 22,000 |
| Land demand for construction (ha) | approx. 3,428    | approx. 3,960    |
| Population <b>Luong Son</b>       | 50,000           | 65,000 to 70,000 |
| Land demand for construction (ha) | 500 to 600       | 900 to 1,000     |
| Population <b>Mai Chau</b>        | 25,000           | 30,000 to 40,000 |
| Land demand for construction (ha) | 400              | 450 to 550       |
| Population <b>Thanh Ha</b>        | 20,000 to 25,000 | 30,000 to 40,000 |
| Land demand for construction (ha) | 300 to 350       | 500 to 550       |
| Population <b>Muong Khen</b>      | 25,000 to 30,000 | 30,000 to 40,000 |
| Land demand for construction (ha) | 400 to 450       | 500 to 550       |
| Population <b>Hang Tram</b>       | 25,000 to 30,000 | 30,000 to 35,000 |
| Land demand for construction (ha) | 300 to 400       | 1,600            |

Source: Construction Master Planning for Hoa Binh Province, 2012

The cities of Ky Son, Da Bac, Cao Phong, Bo (Kim Boi district), Vu Ban (Lac Son district) and Chi Ne (Lac Thuy district) are expected to have around 18,000 to 40,000 inhabitants in 2030. These administrative centers have the role of accelerating the process of core-economic development of the districts in which they are located. The urban land use consumption for construction will rise to around 130-150 m<sup>2</sup> per person in each center.

According to the Provincial Master Plan of Construction, the following eight “new towns” will be constructed:

- In the period to 2020: Cho Ben, Cao Thang commune, district Luong Son; Mong Hoa, Mong Hoa commune, district Ky Son.
- In the period to 2030: Muong Vo, Nhan Nghia commune, district Lac Son; Lam Hoa, Vu Lam commune, district Lạc Sơn; Pho Re, An Nghia commune, district Lac Son ; Lo, Phong Phu,

commune, district Tan Lac; Van Hoa, Mai commune, district Mai Chau; Dung Phong, Dung Phong commune, district Cao Phong.

The number of inhabitants in each town will be around 600-800 and the urban land consumption for construction will rise to around 130-150m<sup>2</sup> per person in each center.

Targets regarding rural development are:

- To develop a model of rural development associated with forestry, using the favorable conditions of water availability to organize clusters of industrial agricultural and forestry operations.
- To develop a model of rural development associated with agriculture; integrated planning of residential, infrastructure, livestock and production areas to ensure environmental sustainability and sustainable development.
- To develop a model of rural development associated with aquaculture; building and development of residential areas along rivers and lakes in order to explore aquaculture and marine fishing.
- To develop a model of rural settlements along the highway; building local transportation networks to create favorable conditions for production (industrial crops).
- To develop a model of social development associated with tourism services, including those communes with cultural and landscape potentials. Planning should promote the preservation of cultural values and the natural landscape.

The Master Plan for Construction in Hoa Binh province mentions development goals concerning infrastructure development (flood management, disaster planning, water and electricity supply, solid waste disposal, cemeteries and the drainage system); environmental protection; investment priorities and administrative organization.

### **3.2.5 Detailed Construction Master Planning**

Based on an approved Provincial Construction Master Plan, the Provincial Department of Construction (DOC) prepares master plans for districts (Table 9), submitting them to the respective authorities for approval. Detailed planning for communes of class II and higher are approved by the Prime Minister while those of class IV and V are approved by the Provincial People's Committee (Table 6). Hoa Binh province has only communes of class IV and V. Due to inadequate capacity, facilities and technical training; the Local People's Committee usually outsources plans either to provincial offices or outside consultants (Konrad-Adenauer-Stiftung, ACVN 2011).

After approval, detailed construction plans are exhibited at DOC and in the city/town offices of the People's Committee. Designed by outsiders without public participation, these plans rarely take into account local characteristics or residents' priorities or concerns. Hence, local authorities typically encounter considerable resistance when trying to implement the plans.

The general public is not involved in any steps of the planning process nor is it informed about the existence or location of these plans (Konrad-Adenauer-Stiftung, ACVN 2011). Furthermore, there are no guidelines on "how" to inform citizens. Information is often passed to block/village representatives rather than to citizens directly.

### **3.3 Mineral Resources Planning**

Before the promulgation of the most recent Mineral Law (2010), many problems could be identified in the licensing process of mineral activities. According to information published in the Official Gazette

News<sup>10</sup>, a total of 3,882 mineral explorations, mining or processing licenses were granted by provinces from 2005 to 2008. This is an impressive figure when compared with the 928 projects licensed by the Ministry of Industry and Trade and the Ministry of Natural Resources and Environment over a 12-year period from 1996 to 2008. For instance, the province of Nghe An granted 127 mining licenses to mine owners who had not yet obtained certificates on land use rights.

Table 9: Hoa Binh Province: Districts and Communes

| Districts, capital      | No. of Communes | Population | Area (km <sup>2</sup> ) |
|-------------------------|-----------------|------------|-------------------------|
| Da Bac                  | 20              | 53,204     | 778                     |
| Ky Son, Ky Son          | 10              | 33,380     | 210                     |
| Luong Son, Luong Son    | 20              |            |                         |
| Mai Chau, Mai Chau      | 23              | 53,944     | 571                     |
| Tan Lac, Muong Khen     | 24              | n/a        | n/a                     |
| Cao Phong, Cao Phong    | 11              | 43,000     | 255                     |
| Kim Boi, Bo             | 27              |            |                         |
| Lac Son, Vu Ban         | 29              |            | 587                     |
| Yen Thuy, Hang Tram     | 13              | 65,780     | 282                     |
| Lac Thuy, Chi Ne        | 15              | 49,460     | 293                     |
| Hoa Binh City (capital) | 15              | 90,920     | 133                     |

Source: website from Hoa Binh Province<sup>11</sup>

Table 10: Mineral planning documents affecting aggregate extraction in Hoa Binh province

| Document  | Approved by          | Drafting body   | Document  |
|---|----------------------|---|---|
| National Mineral Resources Strategy to 2020 with a vision to 2030   | Prime Minister, 2011 | Relevant sectoral ministries: MONRE, MIT, MOC<br>Sectoral Department of MPI | Decision: 2427/QD-TTg<br>Resolutions: 103/NQ-CP; 02/NQ/TW<br>Directive: 02/CT-TTg |
| National Master Plan on Geological Baseline Survey of Minerals through 2020 with orientations toward 2030 | Prime Minister, 2013 | MONRE   | Decision: 1388/QD-TTg   |
| National Master Plan for Exploration, Mining, Processing and Use of Minerals as Construction Materials    | Prime Minister, 2012 | MOC   | Decision: 152/2008/QD-TTg; 45/QD-TTg<br>Circular: 04/2012/TT-BXD                  |
| Plan for Exploration, Exploitation and Usage of Minerals in Hanoi City 2020                               |                      |   |   |
| Master Plan for Exploitation and Use of Minerals for Construction Materials in Hoa Binh Province          | Prime Minister, 2013 | MOC   | Resolution 76/2013/NQ-HDND  |

Clearly, it is important to understand and analyzed how mineral planning is organized and conducted in Vietnam.

<sup>10</sup> Official Gazette, 4 April 2012. Mining decrees stress sustainable development. Available online at: <http://vietnamlawmagazine.vn/mining-decrees-stress-sustainable-development-3931.html>

<sup>11</sup> <http://www.hoabinh.gov.vn/web/guest/home>

Mineral master planning in Vietnam includes the following instruments (Table 10):

- National Mineral Resources Strategy (for a 10-year period and with a 20-year vision);
- National Master Plans on Geological Baseline Surveys of Minerals (for a 10-year period and with a 20-year vision);
- National Master Plans for the Exploration, Mining, Processing and Use of Minerals as Construction Materials (for a 5-year period and with a 10-year vision);
- Plan for Exploration, Exploitation and Usage of Minerals in Hanoi City 2020
- Provincial Master Plans on Mineral Exploration, Mining and Utilization.

### **3.3.1 National Mineral Resource Strategy 2020 with a vision 2030**

Mineral strategies are elaborated for 10-year periods with a 20-year vision, corresponding to the period of relevant socio-economic development strategies (Table 2). The Ministry of Natural Resources assumes the prime responsibility for the strategies, coordinating with the Ministry of Industry and Trade, the Ministry of Construction, the Ministry of Planning and Investment, other ministries and ministerial-level agencies and concerned localities to elaborate mineral strategies for submission to the Prime Minister for approval.

The National Strategy was approved by the Prime Minister in 2011 (Decision 2427/QD-TTg) as a key document to implement the Mineral Law (2010). The overall goal is to combine the sustainable extraction of resources with processing in order to create high economic value.

The National Strategy stipulates that:

- a) Minerals (i.e. state property) must be managed, protected, exploited and used rationally, economically and efficiently to meet the country's requirements for industrialization and modernization;
- b) Survey and evaluation of mineral resources must be implemented in advance to permit efficient planning for the exploration, exploitation, processing and use of mineral resources and national reserves;
- c) Exploration and mining must be linked to the potential for processing and use of each type of mineral, in light of the needs of all economic sectors;
- d) International cooperation must be utilized to gain current scientific knowledge and environmentally-friendly technologies for improved surveying, exploration, mining and processing of minerals.

The Mineral Strategy focuses on:

- Carrying out basic geological survey for minerals;
- Exploring, exploiting and processing groups of minerals such as those used in construction;
- Implementing international cooperation.

With respect to management and planning, the strategy mentions:

- Improving the set of legal documents governing mining, increasing management capacity from the central to local governments and ensuring close coordination between central and local governments, thereby speeding up inspections and the examination of activities;
- Setting up plans on the management of minerals according to the provisions of the Mineral Law.

With respect to technology:

- Carrying out a step-by-step application of advanced techniques as well as modern equipment in the surveying, exploring, mining and processing of minerals;
- Improving the capacity of pit mining technology;
- Developing technical standards for mining and processing equipment as well as technology to protect the environment and preserve natural resources.

With respect to finance:

- Prioritizing the annual allocations of sufficient state funds for basic geological surveys;
- Increasing investment in scientific research and the application of new technologies in geological surveys as well as the exploration, mining and processing of minerals.

With respect to environmental protection:

- Inspecting and supervising the implementation of environmental protection legislation.

Regarding non-metallic minerals used for construction, the Strategy mentions:

- Exploring and exploiting mines for cement projects within the approved Industry Development Master Plan; not exploiting limestone on the mountainsides along highways to protect the landscape;
- Conducting large-scale exploitation and centralized processing of white limestone in Nghe An and Yen Bai; restricting small-scale exploitation and not exporting block limestone;
- Exploring and exploiting granite and gabbro stone in the provinces of Yen Bai, Thanh Hoa, Nghe An, Binh Dinh, Phu Yen, Khanh Hoa, Ninh Thuan, Dak Lak Gia Lai, Kon Tum and Tay Ninh as well as sedimentary rock mines in Cao Bang, Thai Nguyen, Yen Bai, Thanh Hoa and Nghe An to meet construction demands. Block rock should not be exported;
- The exploitation of minerals for standard building materials must be associated with labor safety as well as landscape and environment protection. Building materials must not be exploited on mountain- or hillsides and foothills along national highways.

In addition to the National Mining Strategy, the government has issued the following documents:

- Resolution on the Action Plan for Implementing the Mineral Strategy (103/NQ-CP): The Action Plan sets out the task of disseminating mining legislation and completing the legal system on mining. Two decrees have so far been implemented:
- Decree 158/2016/NC-CP, detailing the implementation of a number of articles of the mineral law,
- Decree 22/2012/NC-CP, describing the principles and procedures for the auction of mining rights. Minerals for construction are not subject to auction.
- Directive on Enhancing State Management for Exploration, Mining, Processing, Use and Export of Minerals (02/CT-TTg): This directive from 2012 was aimed at stopping the export of raw unprocessed minerals. It imposes a complete ban on the export of some minerals (titanium, aluminum) and establishes environmental requirements for mineral processing (gold). Regarding aggregates, the directive temporarily suspends exploration licenses for white marble granite. In addition, the directive confirms that the People's Committees of the provinces are in charge of extending licenses to exploit building stone and sand mines while demanding full compliance with regulations on labor safety and environmental protection. The MOC heads and coordinates with MONRE on all documents and procedures for the exploration, exploitation and use of minerals to make building materials.

### **3.3.2 National Master Plan for Geological Baseline Surveys of minerals with orientation toward 2030**

The MONRE is responsible for the elaboration of the National Plan on Geological Baseline Surveys (Mineral Law 2010 – Article 11). The information regarding the assessment of mineral potential belongs to the state and the users of such information must reimburse state investment in this regard.

In 2013 the Master Plan was approved for the basic geological survey of minerals to 2020 with orientation towards 2030 (Decision 1388/QD-TTg). According to the document, the results of the basic geological survey of minerals must actively serve the management of mineral resources in association

with environmental protection. Further, these results constitute important sources of data to meet international requirements for the formulation of measures to control natural disasters.

The objectives of the plan are:

- a. To make geological and mineral survey maps: complete mineral survey cartography (scale 1:50,000) in concentrated mineral areas and mineral survey maps (scale 1:500,000) in maritime zones as well as to continue surveying for geological hazards and environmental geology.
- b. To complete the overall assessment of the potential of minerals, in particular coal, iron, zinc, gold, tin, manganese, radioactive ore, kaolin, feldspar, walling and flooring stones as well as minerals of high domestic demand.
- c. To enhance capacity and international cooperation, improve the scientific/technological level and formulate projects on geological surveying using cutting-edge technologies and with large investment.
- d. To establish a geological and mineral database by 2020, satisfying the formulation and application of measures for effective environmental protection as well as hazard prevention and control.

According to the most recent version of the Master Plan, 57% of Vietnam's territory is covered by geological mineral maps (scale 1:50,000).

### **3.3.3 National Master Plan for Exploration, Mining, Processing and Use of Minerals as Construction Materials (Decision 152/2008/QD-TTg)<sup>12</sup>.**

In Vietnam, the MOC has the prime responsibility for drawing up and promulgating a list of minerals to be used as construction materials for export as well as their conditions and standards in coordination with MONRE and environment-related ministries and sectors (Decree 15/2012/NC-CP).

The Mining Law (2010 – Article 13) states that national mining master plans should be elaborated for each kind or group of minerals. They are made for a 5-year period with a 10-year vision and are elaborated on the following principles (Mineral Law 2010, Article 13):

- a. Compliance with socio-economic development, national defense and security strategies/plans, regional master plans, mineral strategies and national master plans on mineral exploration and mining;
- b. Assurance of rational, economical and efficient exploitation and utilization of minerals to meet present needs while taking into account scientific/technological development and mineral needs in the future;
- c. Protection of the environment, natural landscape, historical-cultural relics, scenic places and other natural resources;
- d. A mineral which is used for different purposes shall be indicated in only one master plan.

In 2008 the country approved the National Master Plan for “Exploration, Mining, Processing and Use of Minerals as Construction Materials” (Decision 152/2008/QD-TTg). The MOC is responsible for its elaboration (Decree 15/2012/ND-CP). The document provides estimates of the total mineral reserves<sup>13</sup> and the expected demand for construction materials (Tables 6 and 7). In January 2012, Decision 45/QD-TTg

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<sup>12</sup> Since the release of the National Master Plan, only Decision 45/QD-TTg (2012) has been approved to adjust and supplement some articles of Decision 152/2008. Adjustments are incorporated in the analysis.

<sup>13</sup> In international discussion the word “reserve” refers to a mineral resource whose extraction has been authorized. Without such permission no mineral work can take place (British Geological Survey 2013). Thus, aggregated resources for which extraction permits have been issued are also called reserves (Kholer 2006 in Langer 2011)

adjusted and supplemented the figures on exploration, exploitation and use of eight minerals for construction materials: kaolin, white clay, feldspar, fire clay, white sand, dolomite, limestone and granite.

From the minerals listed in the National Plan as construction materials, only limestone, dolomite and igneous rocks (granite) are recognized by international organizations as natural aggregates and minerals for construction. Aggregates such as sand and sandstone (one of the most common sedimentary rock) are not included in National Master Planning. Furthermore, although the text of the document mentions limestone, dolomite and igneous rocks (granite), national statistics only make reference to limestone and stone in general (Tables 11 and 12). Only broad statistics on mineral reserves (Table 11) and the expected material demand until 2020 (Table 12) are available.

Table 11: Vietnam: Number of mines and reserves of selected minerals used for construction material in 2012

| Mineral   | Total mines | Of these mines: |          | Mineral reserves (million tons)* |         |                             |
|-----------|-------------|-----------------|----------|----------------------------------|---------|-----------------------------|
|           |             | Not surveyed    | Surveyed | Total                            | B+C1+C2 | Natural reserves Category P |
| Limestone | 351         | 77              | 274      | 4,473.8                          | 1,255.7 | 3,218.0                     |
| Stone     | 324         | 127             | 197      | 1,056.0                          | 800.0   | 1,048.0                     |

B: Reserves in place have been explored but are only roughly known. The quality and properties of the ore are known in sufficient detail to ensure the basic reliability of the projected exploitation.

C1: Reserves have been estimated from a sparse grid of trenches, drill holes or underground workings; C2: Reserves are based on an extremely widely-spaced exploration grid that provides little data; P: Estimated resources are outside areas explored in detail and are often based on data from trenches.

\*Original figures provided in m<sup>3</sup>. To convert volumes into masses, it was assumed that stones are in their natural state. As no information is provided regarding the type of stone (basalt and granite), the same conversion factor was used for both minerals, namely 2811 kg/m<sup>3</sup>.

Source: adapted from Decision 152/2008/QD-TTG and Decision 45/QD-TTg from 2012 Master Plan for Exploration, Mining, Processing and Use of Mineral for Construction Material

Table 12: Vietnam: Expected demand for minerals for construction up to 2020

| Mineral               | 2008-2010 | 2011-2015 | 2016-2020 | Total   |
|-----------------------|-----------|-----------|-----------|---------|
| Limestone             | no data   | no data   | no data   | no data |
| Stone (million tons)* | 281       | 843       | 843       | 1,967.7 |

\*Original figures provided in m<sup>3</sup>. To convert volumes into masses, it was assumed that stones are in their natural state. As no information is provided regarding the type of stone (basalt and granite), the same conversion factor was used for both minerals, namely 2811 kg/m<sup>3</sup>.

Source: Adapted from Decision 45/QD-TTg from 2012

National Mineral Planning (Decision 45/QD-TTg) provides projections for macro-regions (Northwest, Northeast, Red River Delta, North Central Coast, South Central Cost, Central Highlands, Southeast and Mekong River Delta), provinces, districts and communes. The document also specifies the site location (grid reference) and in some cases a description and the year of discovery.

For the Hoa Binh Province, only the Master Plan version from 2008 (Decision 152 was later replaced by Circular 45 from 2012) indicates the exploitation of dolomite in the Da Bac district (two sites) without providing figures.

In 2012 the Ministry of Construction published a circular on Guiding the Export of Minerals as Building Materials (Circular 04/2012/TT-BXD). Surprisingly, the circular gives a detailed list of minerals banned from export including, in some cases, spatial references. Minerals banned from export are: limestone

and additives named in the master plan or used to produce cement; building stone from mines in south-eastern and south-western provinces; stone blocks; salted sand; building sand (natural sand); gravel; feldspar and clay (Table 13).

Table 13: Vietnam: List of minerals used in construction and banned from export

|   |
|---|
| Limestone and additives included in the master plan or minerals for use as material for cement production |
| Building stone extracted from mines in south-eastern and south western provinces                          |
| Stone blocks  |
| Salted sand   |
| Building sand (natural sand)  |
| Gravel  |
| Feldspar  |
| Clay, hill earth  |

Source: Ministry of Construction, Circular 04/2012/TT-BCT

Summarizing, despite the Vietnamese government's protection of natural aggregates from export (Table 13), no detailed information on production and consumption is available at the national level.

### 3.3.4 Master Plan of the Hoa Binh Province for the Exploitation and Use of Three Types of Minerals as Construction Materials

In 2013 the Hoa Binh Province published a Master Plan for the Exploration, Exploitation and Use of Three Minerals (sand, stones and clay) as Construction Materials (Resolution 76/2013/NQ-HDND). The development of the plan was coordinated by the Provincial People's Committee.

As the objective of the document is to approve planning documents, it largely provides targets to be achieved by 2020.

According to the plan, 1,373 hectares are already being used for the exploration and exploitation of stones for construction and a further 95 for sand (Table 14). The plan expects these figures to increase by 63% and 67% respectively to 2020. This impressive growth is forecast to take place in the 11 districts making up the province (Table 9). Luong Son is expected to produce the highest volume of stones for construction in the province (74%) while Ky Son will produce the highest volume of sand (96%).

## 3.4 Land Use Planning

In Vietnam, the state owns and controls the land. It assigns the main form of use (agricultural, forestry, or residential) to a plot of land and decides who has the right to use the plot for a specified length of time. The legal framework to land usage in Vietnam can be divided into three categories: land ownership<sup>14</sup>, land management<sup>15</sup> and land use rights<sup>16</sup>. The objective of this section is to analyze land use planning, which is designed to accelerate the country's development in terms of urbanization, industrialization and modernization.

According to Hansen (2013), over the past 20 years the government has appropriated land for the following three reasons: infrastructural development, urbanization and economic development

<sup>14</sup> The Land Law of 2003 states that land belongs to the entire people and the state represents the owner (i.e. the entire people) of the land.

<sup>15</sup> Management of land gives the state rights over the control and administration of land.

<sup>16</sup> Land use rights give individuals, families, households and organizations the right to directly control and use the land, enjoy the products of land use and dispose of the land use rights.

(i.e. the establishment of economic zones, industrial zones, etc.). Additionally, the Vietnamese government has the power and right to appropriate land in the national interest, whether for economic, collective, defense or security purposes.

Table 14: Hòa Bình Province: Plan for the exploration, exploitation and use of three types of minerals as construction materials, 2013

| Type of Material & Districts   | Area for exploration and exploitation |                     |                      | Planned area (ha) | Expected production in 2019 (tons/year) |
|--------------------------------|---------------------------------------|---------------------|----------------------|-------------------|---|
|                                | In use (ha)                           | Projected 2019 (ha) | Increase to 2019 (%) |                   |   |
| <b>Stones for construction</b> | <b>1373.45</b>                        | <b>2406.19</b>      | <b>63.6</b>          | <b>3779.64</b>    | <b>32,180,328*</b>                      |
| Đà Bắc                         | 3.0                                   | 88.9                | 96.7                 | 91.9              | 224,880                                 |
| Kỳ Sơn                         | 91.3                                  | 166.39              | 64.5                 | 257.7             | 2,811,000                               |
| Lương Sơn                      | 965.89                                | 1,189.34            | 55.1                 | 2155.23           | 23,789,493                              |
| Mai Châu                       | 7.3                                   | 79.7                | 91.6                 | 87.0              | 281,100                                 |
| Tân Lạc                        | 22.4                                  | 32.6                | 59.2                 | 55.0              | 421,650                                 |
| Hòa Bình                       | 20.64                                 | 6.86                | 24.9                 | 27.5              | 365,430                                 |
| Cao Phong                      | 14.84                                 | 53.96               | 78.4                 | 68.80             | 702,750                                 |
| Kim Bôi                        | 14.0                                  | 227.91              | 94.2                 | 241.91            | 801,135                                 |
| Lạc Sơn                        | 8.0                                   | 84.78               | 91.3                 | 92.78             | 421,650                                 |
| Yên Thủy                       | 51.2                                  | 162.95              | 76.0                 | 214.15            | 885,465                                 |
| Lạc Thủy                       | 164.87                                | 321.37              | 66.0                 | 486.24            | 1,475,775                               |
| <b>Sand for construction</b>   | <b>95.0</b>                           | <b>195.3</b>        | <b>67.2</b>          | <b>290.3</b>      | <b>1,105,150**</b>                      |
| Kỳ Sơn                         | 95.0                                  | 178.0               | 65.2                 | 273.0             | 1,057,100                               |
| Lạc Thủy                       | -                                     | 17.3                | 100                  | 17.3              | 48,050                                  |

\*Original figures provided in m<sup>3</sup>. To convert volumes into masses, it was assumed that stones are in their natural state. As no information is provided regarding the type of stone (basalt and granite), the same conversion factor was used for both minerals, namely 2811 kg/m<sup>3</sup>.<sup>17</sup>

\*\*Original figures are provided in m<sup>3</sup>. As no information is provided regarding the type of sand (wet/dry), the same conversion factor was used for both, namely 1922 kg/m<sup>3</sup>.<sup>18</sup>

Source: Adapted from the Hoa Bình Master Plan for Exploration, Exploitation and Use of Three Types of Minerals as Construction Materials (Resolution 76/2013/NQ-HDND)

According to the Land Law (Article 35), the principles governing the master plan and plans on land use are as follows:

1. To be formulated in a top-down way from the master level to local level. The master plan on land use at the subordinate level must conform to the master plan on land use at the superior level, and the land use plan must conform to the master plan on land use approved by competent state agencies. The National Master Plan must take into account specific characteristics of and links to the socio-economic regions while the district level master plan on land use must take into account the contents of the commune level land use.
2. To use land economically and efficiently.
3. To ensure reasonable exploitation of natural resources, environmental protection and adaptation to climate change.
4. To protect and restore cultural-historical relics and scenic sites.
5. To be democratic and public.

<sup>17</sup> www.simetric.co.uk

<sup>18</sup> www.simetric.co.uk

6. To ensure that the land fund is primarily used for purposes of national defense and security, to serve the national and public interest as well as for food security and environmental protection.
7. Master plans and plans for sectors, fields and localities that use land must conform to the master plans and plans on land use already decided or approved by competent state agencies.

Article 37 of the Land Law states that national and provincial master planning must be drawn up for a five-year period; district level land use plans must be drafted every year. Article 43 of the Land Law demands public consultation on national/provincial master plans as well as plans on land use. This must be implemented by disseminating the contents of master plans and plans on land use on the websites of the Ministry of Natural Resources and Environment and the provincial-level People's Committees. Public consultation on district-level master plans and plans on land use should be conducted by means of meetings and direct consultation as well as by disseminating the contents of master plans and plans on land use on the websites of provincial and district-level People's Committees.

Land Use Plan planning instruments in Vietnam (Table 15) define rights of way and floor area ratios as forms of land usage. They also contain a zone-by-zone projection of the expected future population (Association of Cities of Vietnam 2011).

Table 15: Land use planning documents affecting aggregate extraction in Hoa Binh province

| Document   | Approved by                   | Drafting body                 | Document   |
|--|-------------------------------|-------------------------------|--|
| National Land Use Master Plan to 2020              | National Assembly, 2011       | MONRE, Department of Planning | Resolution: 17/2011/QH13   |
| National Five-Year Land Use Plan 2016-2020         | National Assembly, 2016       | MONRE, Department of Planning | Resolution: 134/2016/QH13  |
| Provincial Land Use Master Plan to 2020            | Prime Minister                |                               | Resolution: 43/NQ-CP   |
| Provincial Five-Year Land Use Plan 2011-2015, 2013 | Prime Minister                |                               | Resolution: 43/NQ-CP   |
| District Land Use Master Plan                      | Provincial People's Committee |                               | Individual Decisions for the districts: Lac Thuy, Kom Boi, Lac Son, Mai Chau, Hoa Binh City, Cao Phong |

### 3.4.1 National Land Use Master Plan to 2020

The master plan has the following main objectives:

- To closely manage land resources; to ensure proper economical and effective use of land. To protect the eco-environment and effectively respond to climate change and rising sea levels, ensuring sustainable development. To promote to the utmost land potential and resources to meet requirements for industrialization, modernization and economic restructuring, ensuring national food security and achieving national socioeconomic development, defense and security objectives.
- To determine the boundaries of, and publicize, areas for rice cultivation and protection and special-use forests subject to strict protection. To regulate and allocate resources, primarily funding from state budgets, in a way that reconciles the interests of localities with industrial development conditions and those with large areas dedicated to rice cultivation; to increase investment in socio-technical infrastructure and build facilities to preserve, process and consume rice in rice-growing localities; to adopt appropriate policies and measures to reduce production costs and raise incomes for rice growers to ensure stable production.

- To closely manage and supervise development master plans for economic zones, industrial parks and clusters, land for non-agricultural production and business starts-ups. Land for non-agricultural production and business must be used economically and effectively under planning.
- To boost administrative reform in the state management of land; to increase the inspection, examination and prompt handling of legal violations to maintain the use of land.

In April 2016 the National Assembly approved the National Land Use Plan for 2016-2020. The government recommended that 3.76 million hectares should be used for rice-growing by the year 2020, a reduction of 270,000 ha from the figure for 2015. In addition, 400,000 ha of land used for rice cultivation should instead be used for growing annual crops, i.e. corn, nuts, soybean, vegetables and flowers. Some land areas along the Central Coast and the Mekong Delta are no longer suitable for rice cultivation due to salinization, flooding, land degradation and drought. The country currently has 4,400,000 ha of protected forests, and will restore and plant around 240,000 ha of forest in critical watersheds, coast and border areas<sup>19</sup>. The introduction of advanced agricultural technology on the remaining rice-growing land is expected to significantly boost production to around 42 million metric tons per year<sup>20</sup>. Unused land should be utilized to build new infrastructures, industries and new towns, as well as for growing other crops. By 2020 Vietnam will have almost 2 million ha of urban built-up area, an increase of approx. 299,320 ha from 2016. Of this land, the proportion used for residential purposes will be the 10%, which implies an average of 50 m<sup>2</sup> of housing land per person. Land for traffic will be more than 779,000 ha, an increase of 87,910 ha on 2016<sup>21</sup>. According to an interview given by the Minister of Natural Resources and Environment<sup>22</sup>, the government will set aside 11,000 ha to build 96 golf courses across the country, one part of the national plan to allocate 46,800 ha for fitness and sports purposes, which is an increase of 2,000 ha on the National Assembly's target.

### 3.4.2 Land Use Plan for Hanoi Region

The Land Use Plan for Hanoi Region defines land use, rights of way and floor area ratios. It also contains, zone by zone, a projection of the expected future population (Figure 6). The zoning plan is overlaid onto a detailed topographic base map. According to Bertaud (2011): "the coordination between the construction of the primary infrastructure network and urban development is excellent", concluding that the land development process in Hanoi is efficient in terms of land use, income mix and land development of primary infrastructure.

### 3.4.3 Land Use Plan for Hoa Binh Province (2011-2020) and Quinquennial Plans

The most recent Five-Year Land Use Plan available for the Hoa Binh province corresponds to the period 2011-2015. The document contains tables and targets yet no maps showing the current patterns or future projections of land use. The land use structure of the province is predominantly agriculture (76, 58%). According to land use projections to 2020 (Annex 2), it will increase slightly (78, 94%). Table 16 shows the projected changes in land use according to next year projections.

<sup>19</sup> Vietnam Express. April 9, 2016.

<sup>20</sup> Tuoi Tre News. March 22, 2016.

<sup>21</sup> Vietnam News. Op. cit.

<sup>22</sup> Tuoi Tre News Op. cit.

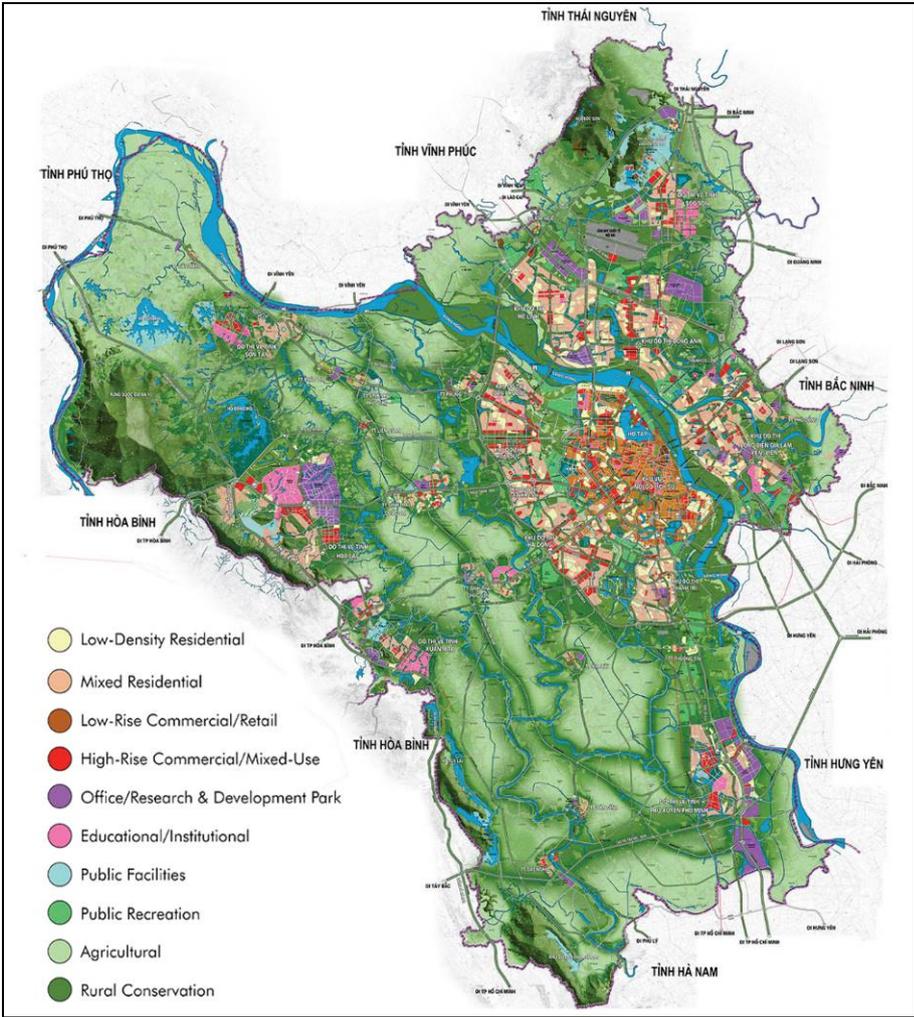
Table 16: Hoa Binh province: changes in land use (hectares)

| Targets                         | 2011-2020 | 2011-2015 | 2016-2020 |
|---------------------------------|-----------|-----------|-----------|
| Agriculture to non-agriculture  | 11,573    | 6,633     | 4,940     |
| Within agriculture land         | 214       | 10        | 204       |
| Unused land to agriculture      | 22,441    | 13,975    | 8,466     |
| Unused land to non-agricultural | 2,426     | 1,712     | 714       |

Source: Hoa Binh Province Land Use Plan, 2013

The plan points out that a land-use map (1:100,000) is available showing the spatial distribution of the forms of land use given in Annex 2 and Table 16.

Figure 6: Land Use Plan for Hanoi



Source: <http://www.perkinseastman.com/dynamic/image/week/asset/liquid/1500x/92/777777/Center/3409990.jpg>

#### 4. Planning challenges for socioeconomic and sectoral planning in Vietnam

There are six key areas in Vietnam's socioeconomic and sector planning system which can be strengthened to address the national goals of urbanization and industrialization in a sustainable and efficient manner:

1. Socioeconomic and sectoral planning is highly centralized, imposing methodological and practical perspectives in a top-down fashion (Lyon Urban Planning Agency 2012).
2. The dominant planning approach is not evidence based. Rather, the process is based on numerical goals and specific targets while ignoring socio-economic realities as well as environmental and geographical contexts. "In Vietnam, planning has been based on demographic indicators. Functional agencies provide forecasts on the number of inhabitants for the whole country and for each province/city. Once approved, these forecasts will serve as the basis for planning activities in all sectors (health care, transport, education, housing...). For example, there must be a health station for a certain number of inhabitants, or a certain number of inhabitants, or a certain m<sup>2</sup> of school per student, etc. Therefore, each locality must reserve a certain area of land and prepare a construction plan to meet the indicators set by the law. Budget and grants from higher levels to the locality are based on this planning." (Lyon Urban Planning Agency 2012:9)
3. The Vietnamese planning system, as in many countries, is fragmented and without sufficient horizontal and vertical integration or coordination across spatial jurisdictions (Figure 2). Strategies and plans often run on different schedules and use inconsistent data or projections (World Bank 2011). With some exceptions at the national and provincial level (MONRE and MOC), there is a lack of horizontal coordination among agencies, which can result in conflicting spatial planning.
4. The whole planning system is prescriptive (not regulatory), laying out specific ways to use land in specific locations.
5. Devolution of political power and decision-making has stopped at the provincial level, meaning that decentralization reforms have not empowered districts sufficiently (World Bank 2011).
6. Although participation and consultation in planning are mentioned by all relevant legal frameworks, there are no clear steps or criteria when and by whom master plans should be discussed or in which ways discussions should be conducted. Local government officials do not always understand plans and laws, and they have limited access to training in practical skills required for public participation (Konrad-Adenauer Stiftung and ACVN 2011). When citizens are informed, this is almost always focused on issues affecting them, limiting their ability to express opinions on other planned developments.

Different international organizations have conducted research projects on topics around socioeconomic and sectoral planning in Vietnam (e.g. Lyon Urban Planning Agency 2012, World Bank 2011, Konrad-Adenauer Stiftung and ACVN 2011). Based on their results, the following aspects are described as recurrent characteristics of sectoral planning.

##### 4.1 Construction/Urban Planning

- Urban planning is understood as construction planning based on quantitative and housing design while ignoring socioeconomic realities and local necessities.
- It is vital to coordinate and simplify the set of planning documents and strategies affecting urban territories in order to promote and facilitate inter-sectoral cooperation. Instruments comprise the construction plan, the land use plan and the sectoral plans (transport and housing, technical infrastructure, etc.).

- Unnecessary public investment goes towards expensive infrastructure while the real needs of the population are neglected. The government established criteria for city/town classification (Table 10) to identify the different roles of urban settlements. This classification has implications for tax collection and the allocation of state funding. However, local governments make investments in infrastructure to meet the requirements to be included in the next higher class rather than to meet the needs of local citizens (World Bank 2011).
- Unclear development and calculation of urban targets. Following an observation of the World Bank 2011 (quoting a study conducted by Bertaud 2011 in Hanoi), none of the norms for land consumption per person (see Section 2.3.3) are based on current consumption of land and floor space
- Provinces are incorporating a risky and expensive “new town” approach not based on integrated and comprehensive planning. New town development supports the national government objective of urbanization through a fast and sudden construction of a city from scratch. The process is socially, financially and environmentally risky for all stakeholders. In addition to these risks, planning of new towns is disconnected from the existing urban fabric. According to the World Bank (2011:174), there is a risk of “building too much too fast on the basis of demographic and economic projections, and future real state valuations”.
- The provision of industrial zones (see Section 2.3.3) seems to be disconnected from demand. This observation made by the World Bank (2011) is based on an analysis of occupancy rates in industrial districts across Vietnam.
- Designed by outsiders without public participation, construction planning at the local level rarely takes into account local characteristics or residents’ priorities or concerns.

## 4.2 Land Use Planning

- According to the World Bank (2011): “Since land sales often comprise one of the largest sources of revenue for provinces, and since increase in administrative boundaries and urban land push a city higher up in the urban hierarchy, there is an incentive to sell land and expand outward (even when there is no clear demand). Land revenues are different from most other revenues since provinces are permitted to keep all their land revenues, while they must send part of other revenues to the central government.”
- As with construction planning, local People’s Committees typically outsource land use planning to provincial offices. Thus, land use plans tend to be based on political targets rather than on local demand or spatial challenges (Konrad-Adenauer-Stiftung and ACVN 2011)
- There is no involvement on the part of municipalities and/or the general public in the preparation of land use plans; the public are not informed about the plans even after they have been approved. Consequently, citizens are often opposing these plans when the authorities try to implement them (Konrad-Adenauer-Stiftung and ACVN 2011).
- The current format of land use planning documents is difficult for a non-expert to understand. They are lengthy heavy documents filled with tables and statistics forms but few maps, and no maps that show land use change.
- According to the Land Use Law (2013), public participation is legally required at commune level, although commune planning depends upon higher level planning. However, this is not currently practiced (Konrad-Adenauer-Stiftung and ACVN 2011).

### 4.3 Conclusions and recommendations

- Mineral planning is undertaken at a high spatial level in Vietnam. Documents promote the management, protection and efficient use of minerals to meet the requirements of industrialization and modernization. Although Vietnam has a National Master Plan for Geological Surveys, the document does not have a spatial expression (only a list of coordinates).
- Planning for aggregates is considered in the National Master Plan for Exploration, Mining, Processing and Use of Minerals as Construction Materials. The document provides general and incomplete figures concerning aggregate reserves and the estimated medium-term demand for different construction materials.
- Planning for aggregates has been decentralized down to the provincial level (master plans). Documents do not address the importance of aggregates or the need to assess (environmentally and socially) the exploration and development of extractive activities.
- Planning for aggregates is based on insufficient understanding of the current situation (demand) and does not consider actors' participation at any administrative level.

In summary, it is recommended to establish a monitoring center to support decision-making, to better estimate demand for aggregates (long- and short-term), to consider longer planning periods (20 years or more), to establish a database on mineral deposits (quality, quantity and local importance) as well as to activate and implement a One-Stop-Shop (OSS) instrument to ensure transparency, effectiveness and efficiency in the management of mining licenses by governmental authorities.

## 5. A New Model of Planning for Mining Aggregates – The District Area Master Plan for Mining and Post-Mining

Based on the above considerations and concerns, for example that aggregates are non-renewable minerals that may not be available for future generations, and because of the environmental impacts associated with their extraction (i.e. inefficiencies in transportation, energy usage, CO<sub>2</sub> emissions, and large-scale landscape alterations), a more comprehensive legal and planning framework is required (EU 2000). The absence of such an appropriate framework can result in negative social and environmental impacts and promote the rise and spread of illegal activities.

Representatives of countries with mining interests already stated in Paragraph 46 of the Implementation Plan agreed at the Johannesburg World Summit on Sustainable Development in 2002 that the mining sector can be a significant driver of development. Further, the plan provides measures to “ensure and enhance the potential contribution of mining to sustainable development” (Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development 2013). This requires processes by which a society, through its institutions, decides where different socioeconomic activities should take place.

As outlined above, land use planning can be of assistance here. At the core of land use planning is the joint weighing of competing land uses by all stakeholders (users and those affected by the (changes in) land use) and the joint identification of those uses for which the highest consensus can be achieved – ideally for the purpose of sustainability (GIZ 2012). Land use plans are crucial to identify where aggregate extraction is allowed and under which conditions, and where in principle it is prohibited.

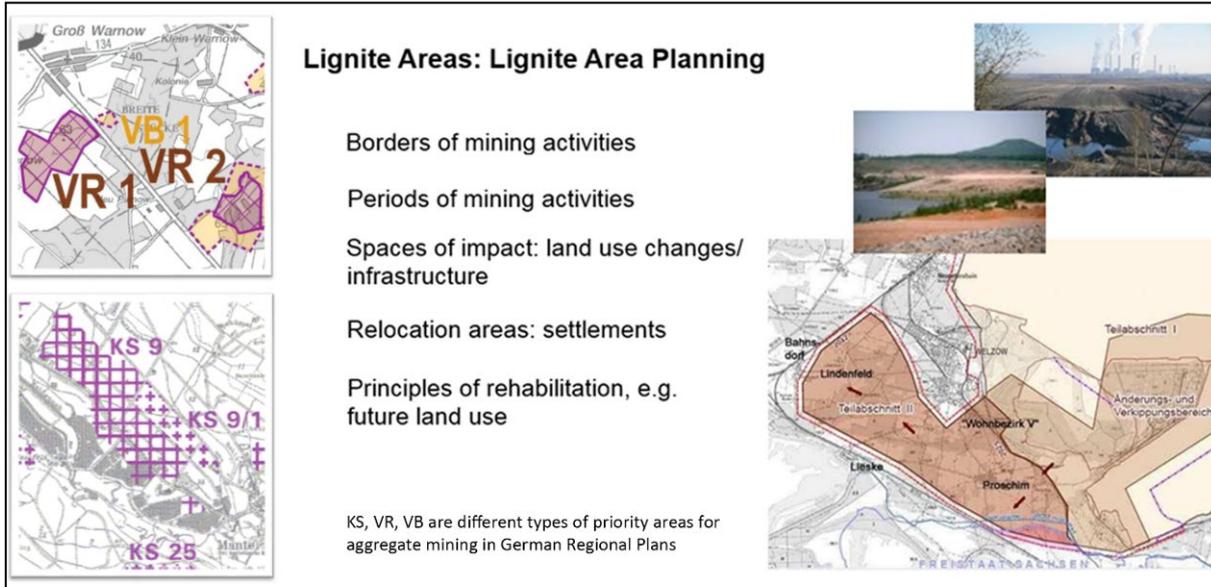
As detailed above, Vietnam has established a very complex system of different plans related to aggregate mining. For example, regional plans for Hoa Binh province indicate those areas where activities of raw material extraction are banned.

- The following should be elements of a comprehensive land use plan incorporating aggregate mining (cf. Study by the EU DG Enterprise and Industry, 2010:9):
- Geological knowledge of mineral distribution;
- Method for identifying mineral resources (quality and quantity) and the means by which this information can be translated into a spatial plan (especially relevant for construction materials);
- Method for estimating the long-term demand for minerals taking into account the recycling of building materials;
- Safeguarding actual and potential mineral resources, avoiding improper land use and/or “sterilization” of mineral resources;
- Providing clear orientations for the access and protection of mineral deposits.

Although Vietnam already possesses an elaborate planning system, some deficiencies should be resolved, namely:

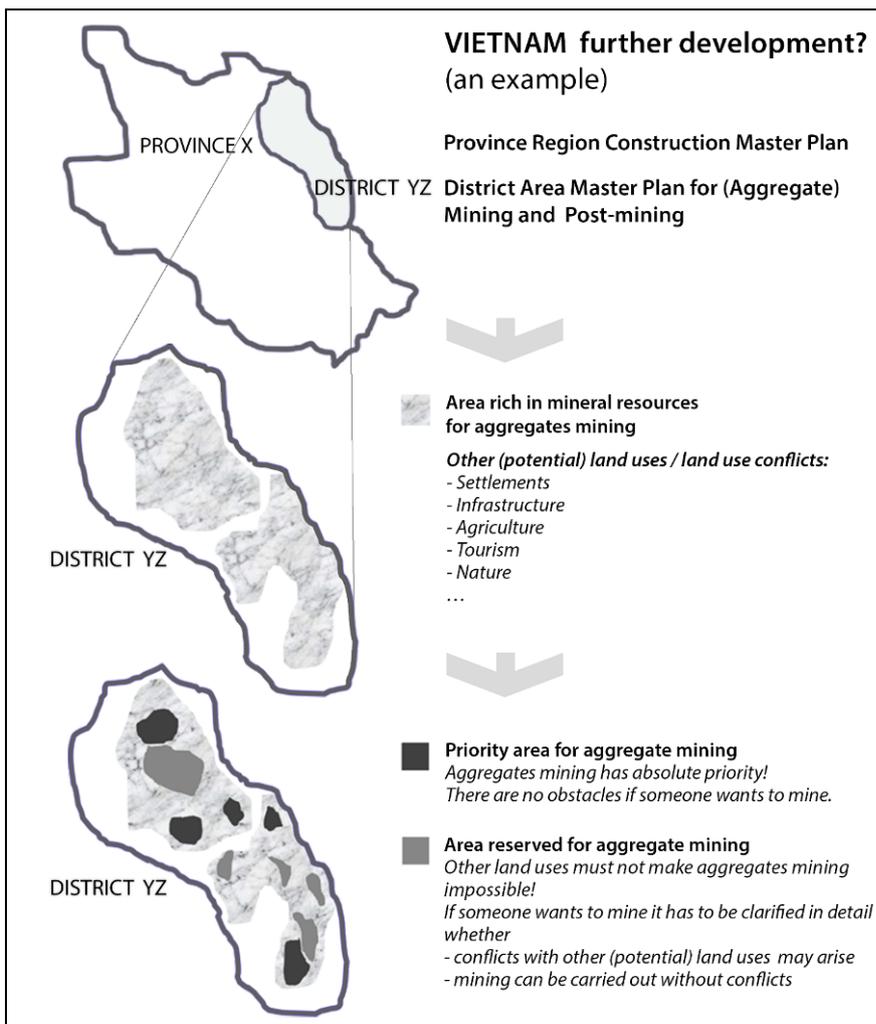
- Socioeconomic and sectoral planning is highly centralized, imposing methodological and practical perspectives in a top-down fashion (Lyon Urban Planning Agency 2012).
- The dominant planning approach is not evidence based. Rather, the process focuses on numerical goals and specific targets while ignoring socio-economic realities and environmental or geographical contexts.
- The planning system is fragmented without sufficient horizontal and vertical integration or coordination across spatial jurisdictions. Strategies and plans often run on different schedules and use inconsistent data or projections (World Bank 2011).
- The planning system is prescriptive (not regulatory), laying out specific ways to use land in specific locations.

Figure 7: Regional Planning in Germany: Priority areas for aggregate mining and Lignite Plan



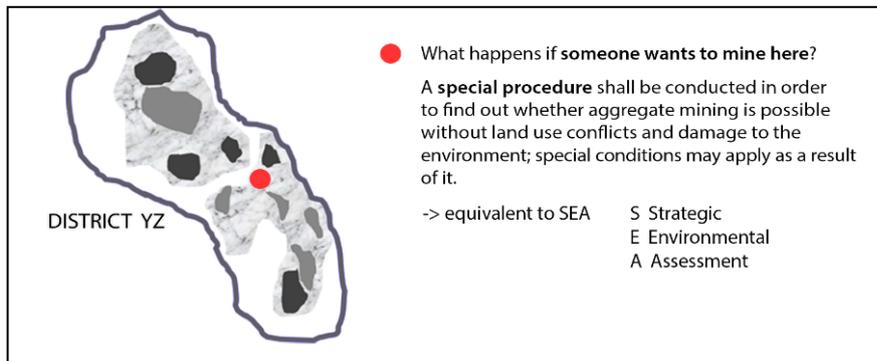
Design: Müller 2018

Figure 8: The District Area Master Plan: Priority areas and areas reserved for aggregate mining



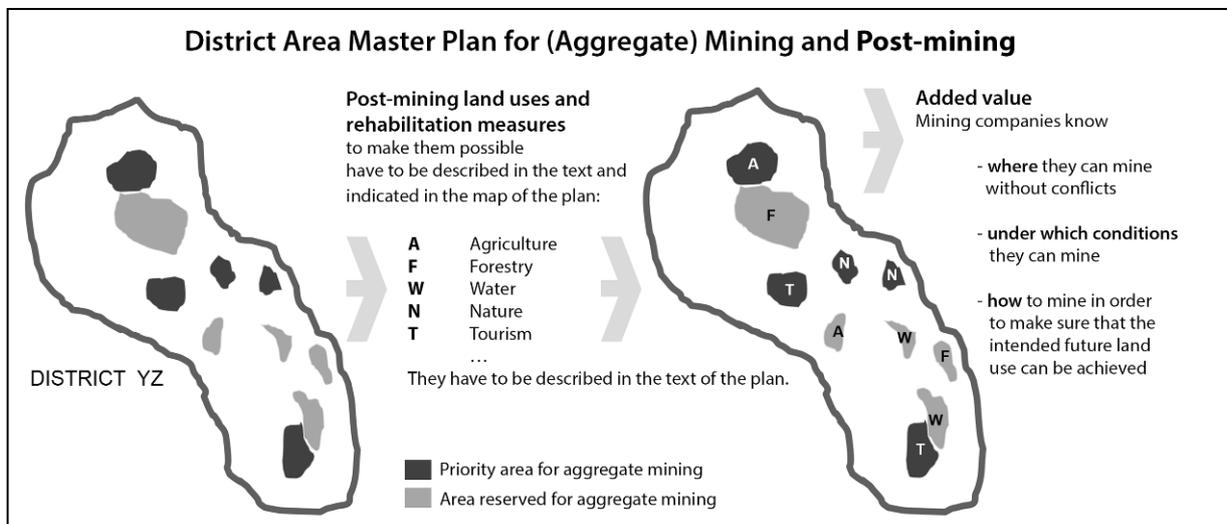
Design: Müller 2018

Figure 9: Special procedure for mining interests outside Priority Areas and Areas Reserved for Aggregate Mining



Design: Müller 2018

Figure 10: The District Area Master Plan: Post-mining land uses



Design: Müller 2018

- Devolution of political power and decision-making stops at the provincial level, as decentralization reforms have not sufficiently empowered districts (World Bank 2011).
- Although mentioned by all legal frameworks, participation and consultation are without clear steps or criteria determining when and by whom master plans are discussed or how the discussion should be conducted. Local government officials do not always understand plans and laws, and they have limited access to training in those practical skills needed to ensure public participation (KAS and ACVN 2011).

In order to improve planning in Vietnam regarding the sustainable extraction of aggregates, it can help to consider the German planning system. In Germany, regional planning is responsible for defining different categories of priority areas for aggregate mining. Moreover, special types of plans are elaborated for surface lignite mining (so-called “lignite plans”) where needed (Figure 7). These regulate not only where mining will take place but also what happens in the post-mining period, e.g. regarding land use and re-cultivation measures (including terrain stability and safety aspects).

There is strong cooperation between businesses, policymakers and environmental NGOs during the planning process, aimed at providing a better and more directed re-cultivation of the land after mining activities have ceased. Planning for and developing strategies to address aggregate mining in a comprehensive manner is a delicate process, requiring a careful weighing of various factors and the

needs of different stakeholders, e.g. the region with aggregate resources, the consumer region, the local community and its livelihood, environmental concerns, and the private interest of the mining companies. Other prerequisites are informed strategic planning, a consensus between stakeholders, resource protection, regulation and a forward-looking orientation.

Following Germany's experience in regional planning (Figure 7), it is proposed to establish a new type of planning instrument in Vietnam, namely the District Area Master Plan for Aggregate Mining and Post-Mining. This will regulate not only the location of mining activities but also what happens in the post-mining period, e.g. regarding land use and re-cultivation measures.

The plan should be elaborated by the provincial authority in charge of the management of natural resources in a transparent and participatory process. All concerned stakeholders, including mining operators, districts and communes, NGOs and special interest groups as well as the general public are involved in drafting the plan.

The following steps should be carried out while elaborating the plan, e.g. for District YZ in Province X:

Step 1: Based on geological information on the location of aggregates as well on the quantity and quality of the mineral resources, and with the assistance of the responsible institutions, the provincial planning authority identifies the areas within District YZ which are suitable for aggregate mining (Figure 8, middle sketch).

Step 2: The planning authority conducts a thorough land-use conflict analysis.

- The analysis includes a medium- and long-term forecast of the demand for aggregates.
- The planning authority chairs a decision-making process in order to determine how much and which type of aggregate shall be provided. The respective district authorities as well as all affected communes shall be involved in the decision-making process.
- The planning authority conducts a thorough and participatory analysis of potential conflicts with other current and future land uses, involving all concerned stakeholders and the general public.

Step 3: The planning authority identifies:

- Priority areas for aggregate mining where mining activities have absolute priority. There are no obstacles for any business intending to extract aggregates.
- Areas reserved for aggregate mining where other land uses may be allowed insofar as they do not prevent mining activities. If a business wishes to mine in such an area, it must first be clarified in detail whether conflicts could arise with other (potential) land uses or whether no conflicts with mining activities are to be expected (Figure 8, lower sketch).

If a business wishes to mine outside of these two types of priority zone, a special procedure to analyze potential land use conflicts has to be carried out before a license can be issued (Figure 9).

Step 4: Regarding post-mining land use, the planning authority shall decide in cooperation with all concerned stakeholders which land uses shall be introduced after mining activities come to an end, e.g. forestry, agriculture, lakes, tourism or nature protection. This enables the mine operators and future land users to decide at the earliest opportunity on appropriate measures and ways of mining which may help to achieve maximum post-mining benefits, e.g. in terms of recreation or nature protection and biodiversity (Figure 10).

Step 5: The District Area Master Plan for Aggregate Mining and Post-Mining should be subject to a Strategic Environmental Assessment (SEA) procedure with the following steps:

- Screening: investigating whether an SEA should be conducted;
- Scoping: defining the boundaries of investigation and assessment as well as the required assumptions;
- Documenting the state of the environment to provide a foundation upon which to base judgments;
- Determination of the likely (non-marginal) environmental impacts, usually in terms of direction of change rather than clear estimates;
- Informing and consulting the public;
- Influencing decision-making based on the assessment;
- Monitoring the effects of plans and measures after their implementation;
- Participation: involvement of all stakeholders!

In summary, the District Area Master Plan for Aggregate Mining and Post-Mining is a tool to reduce land use conflicts, to prevent environmental damage and landscape deterioration, to safeguard future development potentials, to envisage the future of the district, to give security to mining companies, to involve all stakeholders, and to establish open and fair participation for the benefit of all.

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## List of legal documents

| Document                    | Regulatory aspect   |
|-----------------------------|---|
| Decree 158/2016/ND-CP       | Guidelines for the Mineral Law  |
| Decision 490/2008/QD-TTg    | Planning on Construction of Hanoi Capital Region until 2020, with a vision towards 2050   |
| Decision 459/2008/QD-BXD    | Establish and regulate the functions, tasks, powers and organizational structure of the Urban Development Agency                      |
| Decision 152/2008/QD-TTg    | Master Plan for the Exploration, Exploitation, Processing and Use of Minerals for Use as Building Materials until 2020                |
| Decision 2427/2011/QD-TTg   | Strategy for Mineral resources until 2020, with a vision towards 2030   |
| Decision 455/2009/QD-TTg    | Modification of the Master Plan for Development of Vietnam's Urban System to 2025 with a vision towards 2050                          |
| Decision 1081/2011/QD-TTg   | Master Plan on Socio-economic Development of Hanoi Region to 2020, with a vision towards 2030   |
| Decision 1354/2011/QD-UBND  | Adjustment of the Regional Construction Plan for Hoa Binh City to 2025  |
| Decision 1659/2012/QD-TTg   | National Programme on Urban development for 2012-2020   |
| Decision 1758/2012/QD-TTg   | Adjustment of the Regional Construction Plan for the Capital Region Hanoi to 2030 with a vision towards 2050                          |
| Decision 1314/2012/QD-TTg   | Regional Construction Plan for the Hoa Binh Province to 2020  |
| Decision 55/2012/QD-UBND    |   |
| Decision/ 45/2012/QD-TTg    | Adjustment of the Master Plan for the Exploration, Exploitation, Processing and Use of Minerals for Use as Building Materials to 2020 |
| Decision 917/2013/QD-TTg    | Master Plan on Socio-economic Development of Hanoi City to 2020   |
| Decision 1388/2013/QD-TTg   | Master Plan for Geological Baseline Survey of Minerals to 2020 with a vision towards 2030   |
| Decision 198/2014/QD-TTg    | Master Plan of the Northern Key Economic Region to 2020 with a vision towards 2030  |
| Decision 1621/2014/QD-UBND  | Regional Construction Plan of Luong Son District to 2020 with a vision towards 2030   |
| Decision 768/2016/QD-TTg    | Adjustment of the Regional Construction Plan for the Capital Region Hanoi to 2030 with a vision towards 2050                          |
| Directive 02/2012/CT-TTg    | Enhancing the State Management for Exploration, Mining, Processing, Use and Export of Minerals (ineffective)                          |
| Directive 03/2015/CT-TTg    | Increase the enforcement of Policies and Laws on Minerals   |
| Resolution 02/2011/NQ-TW    | Strategic Orientation for Minerals and Mining Industry to 2020, with a vision towards 2030  |
| Resolution 17/2011/QH13     | Master Plan on Land Use to 2020, and the 5-Year Master Plan on Land Use for 2011-2015   |
| Resolution 103/2011/NQ-CP   | Government's Action Programme For Materialization of the Political Bureau   |
| Resolution 43/2013/NQ-CP    | Adjustment of the Master Plan on Land Use to 2020, and the 5-Year Master Plan on Land Use for 2016-2020                               |
| Resolution 76/2013/NQ-HDND  | Master Plan for the Exploration, Exploitation and Use of 3 Kinds of Minerals for Construction   |
| Resolution 121/2015/NQ-HDND | 5-Year Master Plan on Socio-economic Development for Hoa Binh Province for 2016-2020  |
| Resolution 03/2015/NQ-HDND  | 5-Year Master Plan on Socio-economic Development for Luong Son District for 2016-2020   |
| Resolution 142/2016/QH13    | Socio-economic Development Strategy of Vietnam for 2011-2020  |
| Resolution 134/2006/QH13    | Adjustment of the Master Plan for Land Use to 2020 and the 5-Year Master Plan on Land Use for 2016-2020                               |
| Resolution 96/2018/NQ-CP    | Adjustment of the Master Plan for Land Use to 2020 and the 5-Year Master Plan on Land Use for 2016-2020 for Hoa Binh Province         |
| Circular 02/2012/TT-BXD     | Guide for the Export of Minerals as Building Material (ineffective)   |
| Circular 04/2012/TT-BXD     | Guide for the Export of Minerals as Building Material (ineffective)   |
| Circular 05/2018/TT-BXD     | Guide for the Export of Minerals as Building Material   |

Source: compiled by authors

## Annex 1

According to the Mineral Law (2010, Article 64), minerals used as standard construction materials include:

1. Sand of all kinds (except siliceous white sand) with  $\text{SiO}_2$  content of less than 85%.
2. Clay used for the production of bricks, clays (except bentonite and kaolin clays) not suitable for the production of construction ceramics, fireclay materials and cement.
3. Sandstone and quartzite stone with  $\text{SiO}_2$  content of less than 85%.
4. Sedimentary rocks (except diatomite, bentonite and rock containing keramzit), magma rocks (except nepheline syenite rock, column or foam basalt), metamorphic rocks (except mica schist rich in vermiculite).
5. Schist except roofing schist, combustible schist and schist containing sericit, disten or sillimanite minerals exceeding 30% in content.
6. Pebbles, gravel and dust not containing gold, platinum, gemstones and semi-gemstones; laterite not containing native metals or metallic minerals.
7. Limestone, chalky clay and marble (except limestone stalactites, white limestone and white marble) not suitable for use as materials for cement production.
8. Dolomite stone with  $\text{MgO}$  content of less than 15%, dolomite stone not suitable for the production of construction glass or for use as materials for the production of facing stones or fine-art stones according to Vietnamese standards and technical regulations.

## Annex 2

Hoà Binh Province: Land Use Structure in 2010 with projections for 2020

| Land Use type                | 2010           |              | 2020           |              |
|------------------------------|----------------|--------------|----------------|--------------|
|                              | Area (ha)      | %            | Area (ha)      | %            |
| Total Area                   | 460,869        |              | 460,869        |              |
| <b>1. Agriculture</b>        | <b>352,922</b> | <b>76.58</b> | <b>363,806</b> | <b>78.94</b> |
| 1.1 Arable                   | 29,865         | 8.46         | 27,150         | 7.46         |
| 1.2 Perennial crops          | 11,536         | 3.27         | 12,596         | 3.46         |
| 1.3 Forest protection        | 112,253        | 31.81        | 119,050        | 32.72        |
| 1.4 Forest                   | 29,538         | 8.37         | 43,000         | 11.82        |
| 1.4 Forest exploitation      | 144,074        | 40.82        | 140,315        | 38.57        |
| 1.5 Aquaculture              | 1,586          | 0.45         | 2,057          | 0.57         |
| <b>2. Non Agriculture</b>    | <b>59,167</b>  | <b>12.84</b> | <b>73,149</b>  | <b>15.87</b> |
| 2.1 Business (offices)       | 335            | 0.57         | 411            | 0.56         |
| 2.2 Defense                  | 3,529          | 5.96         | 4,427          | 6.05         |
| 2.3 Security                 | 266            | 0.45         | 449            | 0.61         |
| 2.4 Industry                 | 110            | 0.19         | 2,429          | 3.32         |
| Industrial Parks             | 90             |              | 1,616          |              |
| Industrial Clusters          | 20             |              | 813            |              |
| 2.5 Mineral activities       | 511            | 0.86         | 807            | 1.10         |
| 2.6 Monuments and landscapes | 86             | 0.15         | 47             | 0.19         |
| 2.7 Waste disposal           | 61             | 0.10         | 6              | 0.27         |
| 2.8 Religious activities     | 25             | 0.04         | 33             | 0.05         |
| 2.9 Cemeteries               | 2220           | 3.75         | 2,489          | 3.40         |
| 2.10 Infrastructure          | 16,477         | 27.85        | 864            | 27.85        |
| Cultural facilities          | 102            |              | 362            |              |
| Health facilities            | 67             |              | 99             |              |
| Educational facilities       | 508            |              | 789            |              |
| Sport facilities             | 233            |              | 614            |              |
| 2.11 Urban                   | 1,132          | 1.91         | 1,691          | 2.31         |
| <b>3. Unused land</b>        | <b>48,780</b>  | <b>10.58</b> | <b>23,914</b>  | <b>5.19</b>  |
| <b>4. Urban Land</b>         | <b>10,151</b>  | <b>2.20</b>  | <b>13,633</b>  | <b>2.96</b>  |
| <b>5. Nature reserve</b>     | <b>29,538</b>  | <b>6.41</b>  | <b>40,220</b>  | <b>8.73</b>  |
| <b>6. Resort Land</b>        | <b>273</b>     | <b>0.06</b>  | <b>2,772</b>   | <b>0.60</b>  |

Source: Hoà Binh Province Land Use Plan, 2013

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