

MAREX Workshop

16.05.2016 | Dresden | Germany

Aggregates mining – Managing the impacts on environment and regional development

In the framework of the Dresden NEXUS Conference from 17 to 19 May 2017

– Summary Report –

Peter Wirth/Anh Minh Vu

using interim results of the MAREX project provided by

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The Background

Following the concept of the MAREX project application, the IOER organized in close cooperation with the German consortium (TU Dresden, TU Dortmund, C&E Chemnitz) and the United Nations University, Institute of Integrated Management of Material Fluxes and of Resources (UNU FLORES, an associated MAREX partner), a workshop on 16 May 2017. The meeting was arranged as a side-event of the Dresden NEXUS Conference 2017, held from 17 to 19 May 2017.

The event provided a summary of the interim results of the MAREX project and to discuss them with an international audience – during the side-event as well in the framework of the conference. From the Vietnamese side, a delegation from the Vietnam Institute of Urban and Rural Planning (VIUP) led by the director, Dr. Ngo Trung Hai, contributed in a substantial way to the side-event as well as to the conference.

The MAREX project is dealing with the impacts of urban growth in Hanoi City on the hinterland. The main focus is on the extraction of building materials (sand, gravel, crushed stone), the most important bulk material for street works, water engineering as well as the fabrication of concrete and asphalt (www.marex-project.de).

Some Interim Results

From 2006, an extensive run on mineral aggregates (mainly crushed limestone) started in Hoa Binh province/Vietnam. Until 2013, about 50 licenses were given to private and state-owned enterprises. The reasons for this booming are manifold. Firstly, the rapid economic development in Vietnam is causing a building boom, first and foremost in the capital Hanoi. Secondly, the accessibility of Hoa Binh was improved in the last decade significantly and the raw materials have become accessible. A third reason is seen in the decentralization of decision making from national to provincial level in the framework of the revised Minerals Law 2005, enabling the province governments in Vietnam to grant licenses for construction materials.

It is striking that most of the administrative districts in the province show only one or two quarries to satisfy the local needs, whereas we can find a high concentration (more than 30 quarries) in Luong Son district which is located closest to the boundary of the Vietnamese capital Hanoi. This is an evidence that the extraction of raw materials in this district is strongly connected with the booming Hanoi construction market which, thus, can be seen as the main driver of aggregates extraction in Hoa Binh province. The expansion of construction activities in Hoa Binh province should also be considered, as an outcome of the government-controlled development of the Hanoi Capital Region that is including an intense catching up of local infrastructure investment, especially in Luong Son as the gate way to the national political center.

A reliable monitoring of resource extraction and the related impacts is a precondition for the reduction of negative environmental and social impacts in Hoa Binh province when we take into consideration that the mining area in the province was extended from 390 hectares (2007) to 1160 hectares (2015), which means almost a tripling in size within less than 10 years. Therefore, monitoring was and is urgently needed, particularly in Luong Son district where a high number of quarries is causing adverse impacts on the quality of life of the local population, degradation of the technical infrastructure, and intensive landscape alteration. But this did not really happen. Our investigations show a lot of relevant shortcomings and inconsistencies in the monitoring practice: licensing documents do not record size and location of operations accurately, the existing system of environmental measurement stations does not display the pollution situation of the quarries, the pollution is measured at the quarry site but not in its surroundings, and difficult to get access to relevant data.



Figure 1: Aggregates mining in Luong Son district, Hoa Binh province (Photo: J. Albrecht)

Having a look at the single mining operation areas, we have to consider that they are in the most cases too small to install the needed extraction technology as required by national and international standards. As about 70 % of the companies have an operation area of less than 10 hectares, a continuous extraction process is hardly possible, and a large part of the mineral resources are now blocked. Moreover, the low capital endowment of the companies hampers the respective investments in on-site infrastructure as submitted and approved during the procedure of licensing the mining right. In the present circumstances, the application of „Cleaner Production Technologies“ is highly restricted.

The mentioned facts affect also material flows in the building industry and resulting environmental impacts sensitively. Material deposits are not used efficiently, thus more land use change and landscape consumption occurs. In addition, the mentioned facts may affect the achievable quality of mining products (inefficient proportion or grading of the aggregate).

These aspects would merit closer consideration and should be incorporated into the overall MFA Model.

In addition to the technical problems, we can also state a number of shortcomings in the governance process, touching the institutional framework conditions, the interactions of actors and the involvement of local population: poor decision making and surveillance (exploration/exploitation licenses), weaknesses in the implementation of environmental and social regulations, a lack of communication/coordination between provincial departments and inadequate participation. Consequently, there are unsolved problems like the legacy of poorly managed operations and un-rehabilitated sites as well as suboptimal conflict resolution, in particular between farmers and the quarry owners.

From a legal point of view, it is of interest that the current Vietnamese legislation, mainly the Laws on Land, on Construction, on Mining and on Environmental Protection define high standards such as mapping requirements, mine design, efficient use of natural resources and related mining technology, land allocation, and procedures for strategic environmental assessment as well as environmental impact assessment. Due to the various reasons mentioned above, there is a clear contrast between a wide range of existing legal environmental regulations, and the widespread poor environmental practice by the mining sector and shortcomings in the state sectoral administration, respectively. This poses future research questions concerning the policy development process in Vietnam in general, and in particular regarding the adequacy of current environmental protection regulations.

The interim results show that the interdisciplinary approach is meeting the needs of the partner country Vietnam to

- improve the monitoring of mining activities and its environmental and social impacts as a basis for decision making of the provincial government;
- investigate the opportunities of Cleaner Production Technologies to overcome shortcomings in the structure of the mining sector, in capital endowment, in technology and in the internal management of the mining companies;
- consider the influence of the regional material-flow analyses on the demand-supply relations of mineral aggregates in Hanoi and its surroundings;
- install a Business-Policy Interface to improve the governance system in aggregates mining, in particular the communication between the provincial government and the mining enterprises.

The MAREX Side-Event on 16 May 2017

The side-event took place in the Leibniz Institute of Ecological and Regional Development with 25 participants from Germany and Vietnam (MAREX project consortium) as well as China, Indonesia and Iran.



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DNC 2017 | **SDGs & NEXUS APPROACH:
Monitoring and Implementation**

WATER, SOIL AND WASTE

17-19 MAY 2017
DRESDEN, GERMANY

DEUTSCHES HYGIENE MUSEUM

f t v

Tuesday, 16 May 2017



Photo: Peter Wirth/IO
Quarry site visit in Hoa Binh Province

MAREX Workshop

Aggregates mining – Managing the impacts on environment and regional development

Convenor: Leibniz Institute of Ecological Urban and Regional Development (IOER)

Location: Leibniz Institute of Ecological Urban and Regional Development, Dresden (IOER) (15-minute walk from Deutsches Hygiene Museum)

Time: 10:00-15:00

Information and Registration: www.marex-project.de/events.html

Figure 2: Announcement of the MAREX Side-event at UNU FLORES Homepage

Program of the MAREX side-event:



MAREX-WORKSHOP - a Side Event of the Dresden NEXUS conference 2017

„Aggregates mining – Managing the impacts on environment and regional development“

- **Date:** 16th May 2017, registration at 10:00 AM
- **Location:** Leibniz Institute of Ecological Urban and Regional Development, Dresden, Weberplatz 1
- **Online registration:** <http://marex-project.de/registration.html>
- **NEXUS website:** <http://www.dresden-nexus-conference.org/2017/programme/side-events/>

Program

10:00 Registration

10:30 **Start of the Side-Event /** Introduction

Prof. Dr. Bernhard Müller, Leibniz Institute of Ecological Urban and Regional Development (IOER), Director

10:50 Urban growth in Hanoi City Region and its implications for construction material supply
Dr. Ngo Trung Hai, Vietnam Institute for Urban and Rural Planning (VIUP), General Director

11:30 Improving the management of aggregates extraction in Hoa Binh Province/Vietnam – a joint German-Vietnamese research concept
Dr. Peter Wirth, Leibniz Institute of Ecological Urban and Regional Development (IOER), Project Manager

12:00 Group photo / Lunchtime snack

13:00 Landscape planning in the Hanoi region and its implications (including raw material extraction)
Dr. Ngo Trung Hai, Vietnam Institute for Urban and Rural Planning (VIUP), General Director

13:30 Challenges and opportunities of aggregates mining in Hoa Binh province – the engineering perspective
Dipl.-Ing. Klaus-Dieter Oswald, Consulting und Engineering GmbH Chemnitz, Executive Board Member

14:00 Panel Discussion: How to manage aggregates extraction in developing countries in a sustainable way?
Chair: Prof. Dr. Bernhard Müller, Leibniz Institute of Ecological Urban and Regional Development (IOER)

15:00-

16:00 **Get together**

16:00-

18:45 City excursion in Dresden

19:00 Dinner (Lingnerschloss)

Impressions

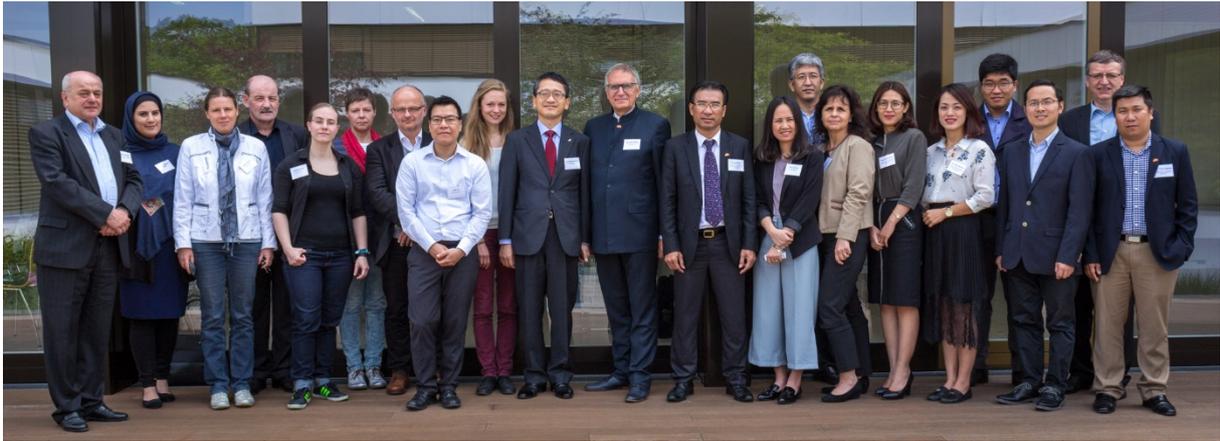


Figure 3: Group photo of the MAREX partners and the delegation from VIUP after the MAREX-Side event (source: Vigh, IOER)

Contributions of the MAREX consortium at the NEXUS Conference 17-19 May 2017

Additionally, there have been four more contributions of the MAREX research partners in the framework of the NEXUS Conference:

Date: Wednesday, 17.05.2017

Time: 14:00-15:30

Session X.2: New and Refined Approaches Supporting the Implementation of a Nexus Approach

Oral Presentation:

Business Policy Interface (BPI) as a Platform for the Sustainable Management of the Extraction of Aggregates – The Case of Hoa Binh Province, Vietnam

Dr. Paulina Schiappacasse, Technische Universität Dresden

Prof. Dr. Dr. Bernhard Müller, IOER/Technische Universität Dresden

Dr. Peter Wirth, IOER

Date: Tuesday, 18.05.2017

Time: 13:30-15:00

Session A.6:

Oral Presentation:

Monitoring of the extraction of mineral resources and its environmental impacts – the case study Hoa Binh, Vietnam

Prof. Dr. Nguyen Xua Thinh, Technische Universität Dortmund

Haniyeh Ebrahimi Salari, Technische Universität Dortmund

Esther Bradel, Technische Universität Dortmund

Date: Thursday, 18.05.2017

Time: 15:00-16:00

Poster Session A.4-A.6

Multifunctional Land-Use Systems

Poster A.5.6:

Management of Mineral Resource Extraction in Hoa Binh Province: A Contribution to Sustainable Development in Vietnam (MAREX)

Dr. Paulina Schiappacasse, Technische Universität Dresden

Prof. Dr. Dr. Bernhard Müller, IOER/Technische Universität Dresden

Dr. Peter Wirth, IOER

Date: Thursday, 18.05.2017

Time: 16:00-17:30

Case Study Vietnam

Management of Mineral Resource Extraction in Hoa Binh Province – a Contribution to Sustainable Development (MAREX)

Presenter/Partner of the IOER:

Ngo Trung Hai, General Director, Vietnam Institute for Urban and Rural Planning (VIUP)



Figure 4: NEXUS Case Study Panel including Prof. Hai (VIUP, second from the left), presenting MAREX project (source: UNU FLORES)