

A REVIEW OF CURRENT PRACTICES OF REVENUE GENERATION FROM NATURAL RESOURCES FOR THE LOCAL BODIES OF NEPAL



**Ministry of Local Development (MoLD)
Local Governance and Community Development Programme (LGCDP)
United Nations Development Programme (UNDP)
United Nations Environment Programme (UNEP)**



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ABBREVIATIONS

B/C	Benefit/Cost
CA-NR	Constituent Assembly – Natural Resources Committee
DADO	District Agriculture Development Office
DDC	District Development Committee
DIO	Department of Irrigation
DTCO	District Treasury Control Office
DTO	District Technical Office
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
FIRR	Financial Internal Rate of Return
GoN	Government of Nepal
HDI	Human Development Index
HDR	Human Development Report
IEE	Initial Environmental Examination
IRR	Internal Rate of Return
LB	Local Bodies
LDO	Local Development Officer
LGCDP	Local Governance and Community Development Project
LSGA	Local Self-Governance Act
LSGR	Local Self-Governance Regulations
MoF	Ministry of Finance
MoLD	Ministry of Local Development
NPC	National Planning Commission
NPV	Net Present Value
Rs.	Nepali Rupee (one US\$ = Rs.75)
SDC	Swiss Development Cooperation
SG&S	Sand, Gravel and Stone
UNDP	United Nations Development Programme
VDC	Village Development Committee

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EXECUTIVE SUMMARY

Background

Sand, gravel, stones (SG&S), and other mined natural resources are the foundations of both the ancient and the modern world. The great structures and wonders of the world would not have been possible without these resources. However, the reckless use of these resources has also led to serious human and property consequences in many countries. Nepal, a mountainous country, has an abundance of SG&S resources which, if utilized judiciously, could help to shape Nepal's development and affluence. However, a balanced outlook on Nepal's SG&S sub-sector seems to be lacking. There are two extreme outlooks – one that tries to accumulate wealth at the cost of the environment, and the other which opts to keep the resources intact and untouched.

In this situation, it is imperative for the country to seek a prudent outlook on the sub-sector so that the undesirable extremes of “quick-and-dirty extraction” and “non-extraction” are substituted by “environmentally regulated extraction,” for which to become feasible, the sub-sector must be observed and studied thoroughly. This realization has led to the production of this report.

Objective

The objective of this study is to produce economic evidence on the economic, social and environmental impacts of current practices of revenue generation from the extraction and use of natural resources such as sand, gravel, and stone (SG&S), with a particular emphasis on rock and stone mining at the local level, and to recommend ways for optimal generation and use of local bodies' (LB) fiscal revenue.

Methodology

The study started with a review of related materials and the formulation of checklists for field-level data collection. Besides a two-day reconnaissance visit to the Sindhupalchok district, five other districts – Kailali, Rupandehi, Makwanpur, Dhading and Sunsari – were selected to ensure geographical variation as well as to capture a broad range of pertinent issues. In each district, stakeholders and the value chain actors like extractors, transporters, processors, end-users and revenue collectors were met individually and in groups to collect specific data and to solicit their opinions. A workshop in each district was also organized within the respective DDC premises where all district level stakeholders participated and discussed the issues and the collected data. The field data were analysed to arrive at quantitative as well as qualitative estimates required to draw policy conclusions for the sub-sector.

System of Revenue Collection and Sharing

Sand, gravel and stone (SG&S) have been an important source of fiscal revenue for the local bodies (DDCs, VDCs and Municipalities) since the year 2000, when the Local Self Governance Act (LSGA 1999) and Local Self Governance Regulations (LSGR 2000) gave ownership of these resources to these bodies. The DDCs collect revenue through tax farmers (out-sourced private contractors), who bid competitively to collect taxes on behalf of the DDCs. The DDCs, in turn, share these resources with the relevant VDCs, municipalities, District Forest Offices and the Buffer Zone Committees in the district.. The revenue sharing formulae is unique to each district and the share that the VDCs and municipalities receive ranges from 35 to 50 percent as specified in the LSGR 2000. Generally, a fixed minimum amount is given to all VDCs and municipalities and criteria are devised to allocate larger shares to those VDCs and municipalities in which SG&S resources are located, or VDCs that make some contribution to the revenue generating process. When no private sector contractors bid for tax collection, the DDCs collect taxes themselves through what is called the amanat system. The amanat system generates less revenue compared to the tax farming system and is only practiced when there are no bids from the private sector. For example, Makwanpur district collected Rs. 81 million from domestic tax contractors in the fiscal year 2009/10. The following fiscal year, however, when the DDC itself collected taxes, it raised less than Rs. 10 million. This large difference

is mostly the consequence of the export ban imposed by the Supreme Court ruling on the advice of the Natural Resources Committee of the Constituent Assembly (CA), because potential bidders did not think they could make profit from the contract, and to some extent, due to the inefficient amanat system. Now that the ban has been lifted, private contractors may be ready and willing to bid again for tax farming

Mandatory IEE/EIA

The CA Committee has also mandated the DDCs to carry out Initial Environmental Examinations (IEEs), or Environmental Impact Assessments (EIAs), of the source rivers and the preparation of environment management plans based on the IEE/EIA findings before domestic tax farming contracts or export permits can be issued. Most districts engaged in SG&S contracts for domestic sales or export have prepared their IEE/EIAs.

The study found that the district IEE/EIA reports followed standard environmental guidelines but differed in content and in their degree of comprehensiveness. In general, the IEE studies that were outsourced to private consultants were more thorough than those carried out by the DDC's own technical staff.

SG&S's Importance as Source of Local Bodies Revenue

Sunsari district is a good example of how important the SG&S sub-sector is to the revenue portfolio of the districts. The income from SG&S ranged from 32.5 percent to 40.5 percent of the total resource-use tax in the entire district. 87 to 99.9 percent of all permit fees collected by the district were for SG&S permits. Similarly, SG&S accounted for 92.6 percent to 98.1 percent of total receipts from sales of resources, 17.1 percent to 36.1 percent of total internal revenues, and 3.6 percent to 7.7 percent of total DDC income, including grants from the central government.

The districts in the Terai were generating more revenue from SG&S because these districts could collect extra export permit fees for SG&S export to India. Makwanpur is the only hill district exporting SG&S to India through custom outlets in Parsa and Bara districts. The maximum annual revenue

record from SG&S is held by Rupandehi district. All terai districts and Makwanpur are exporting 90 percent of the processed SG&S products (mainly gravel and sand) to India.

Environmental Costs vs. Local Bodies Revenue

Crude industry level estimates can be made by multiplying the sample district figures by 4: since there are 15 terai districts – all except Dhanusha, Rautahat, Saptari, Dang and Kanchanpur – and about 8 hill and mountain districts – Sindhupalchok, Kavre, Bhaktapur, Kathmandu, Dhading, Nuwakot, Makwanpur, Kaski and Udayapur – that are dealing with a fair amount of SG&S products. The number of districts handling significant quantities of SG&S products is thus about 5 times the number of sample districts. But, since the sample districts have been chosen from a set of high SG&S transacting districts, multiplying the samples by 4 will provide a reasonable approximation of the overall industry status. The total tax collected from the five sample districts was Rs. 268 million in 2008/09. The industry level approximation from the sample districts will then be Rs.1072 million for that year, as per the above formulation. The claim by SG&S entrepreneurs that they have been paying the government Rs. 2.5 billion in taxes on SG&S products appears to be hugely exaggerated.

The annual value of environmental losses due to SG&S extraction, processing and transport, estimated using the same technique, is at Rs. 206 million, or about 19 percent of the revenue generated. It should be noted that environmental losses were higher in earlier years because of the lack of adequate regulations and monitoring mechanisms. The situation has improved considerably after a mandate was issued to ensure all materials were covered during transport, heavy fines were imposed if sand water was found dripping during transport, and setting strict upper limits on the quantity of SG&S cargo during transport.

Each district had to be considered on a case-by-case basis as it was found that the context of the districts differed greatly. For example, there are problems due to non-extraction of the SG&S resources in some rivers in Makwanpur, Kailali and Sunsari districts while, simultaneously, there were problems of over-extraction, for example, in some rivers in Rupandehi and Sunsari districts. The deep extraction in Seuti river in Sunsari district has caused a virtual collapse of a bridge on the Koshi highway, near Dharan. The Government of Nepal, on the other hand, treated all districts on the

same level with regards to SG&S, with a blanket policy — the export ban of recent past, which has been lifted now, for instance. This study wants to make it clear that the mining, domestic use and export of sand, gravel and stone is beneficial for the country, but should be practiced in a more regulated and monitored way to ensure that environmental costs are kept at the minimum level. The DDCs must comply with the stance taken by the CA's Natural Resource Committee that DDCs should prepare IEE/EIA studies of the source rivers and formulate environment management plans based on IEE/EIA findings.

When it comes to exports of SG&S from Nepal, the destination markets can only be the bordering areas of West Bengal, Bihar, Uttar Pradesh and Uttaranchal states. The export potential is roughly estimated to be for a period of 5 to 10 years, and between 50 to 150 kilometers from the Indian border, until the broad gauge Indian railway system is extended up to the Nepali border. The export boom of the recent past was largely triggered by high economic growth rates in Bihar, which prompted high demand for SG&S products. The broad gauge rail connection up to the Nepali border will reduce transport costs for Indian SG&S products, which are already of better quality because they are quarried, unlike Nepal's river materials which are not of uniform quality. If Nepal is to utilize the SG&S export opportunity, the use of heavy equipment for extraction becomes inevitable because manual extraction with a reduced labour supply will not be sufficient to extract large amounts of annual river debris. However, in order to maintain the pro-poor stance of the sub-sector, some areas, particularly those with relatively steep slopes, need to be designated for manual extraction only.

Resource Pricing

In many districts, only taxes from the transport of SG&S are being collected at road toll points. But, actual extraction of the resource from the river bed or terrace is not taxed. In districts where there are forest buffer zones for protected areas, like in Makwanpur, even resource extraction is directly charged as the price of the resource. In fact, the SG&S resources need to be priced in all districts as this will be one way to increase the revenue for the districts from SG&S. The DDCs in the study districts acknowledged the idea of resource pricing but raised doubts about their ability to administer the prices. SG&S entrepreneurs, however, opposed the idea, claiming that the current tax itself includes the price of the resource, and that further resource pricing would reduce Nepal's competitiveness in SG&S export. This

study recommends introducing a resource pricing system at least for control in resource extraction technology, and a price amount, which could be nominal to start with, in order not to distort the competitiveness in the export market. Moreover, the financial and economic analysis shows that the SG&S trade, both domestic and for export, is highly remunerative. A small extra resource pricing will not reduce the profitability and competitiveness to any significant extent. For resource pricing, a system of extraction permits for each extraction zone (location), identified and recommended by the respective district IEE/EIA reports, can be awarded to the bidders through an auction system similar to the tax farming auction. The auction value can then be the direct price of the resource. The district IEE/EIA reports have recommended safe extraction levels (33 to 50 percent of the annual debris deposit) which will be useful in estimating the revenue the local bodies can expect from resource pricing using the permit system and tax collection. At least Rs. 1.6 million in additional revenues per district can be raised by charging Rs. 0.50 per cubic feet as the price of the resource.

Sub-sector Economics

The financial and economic analysis of different SG&S related activities like processing, transport and export found them to be highly profitable. The economic return in each case was higher than the financial return, indicating that the country is benefitting more than the private entrepreneurs. The attached table prepared from transaction data of various capacity crusher industries in a normal operation year provides a glimpse of the sound economics of the sub-sector. It can be noted from the table that the more labour

Category	FIRR	EIRR
Small crushers	74.4%	87.3%
Medium-size crushers	72.1%	110.7%
Large crushers	76.0%	90.2%
Large digital crushers	77.0%	90.5%

intensive systems, such as the medium-size crushers, have higher economic returns worthy of being supported by the state.

Because of the lucrative nature of the SG&S business, there is “mafia” intervention in many districts – the most notable being in Bara, Sunsari, Kapilvastu, Makwanpur and Kailali districts. “Mafia” activities include capturing contracts, getting large and forced donations from SG&S entrepreneurs, not paying the DDC taxes, etc.

District IEEs/EIAs have recommended 30 percent of the revenue from SG&S to be ploughed back to the source rivers and to compensate those who lose from SG&S resource extraction. The share of SG&S fiscal resources being ploughed back towards river protection works or to compensate the losers has been insufficient. Local governments do not have any specific or planned mechanism for ploughing back SG&S-derived revenues as investments in river management or for compensating the victims of SG&S extraction. Some materials for river training were distributed on an ad hoc basis and upon demand, but the benefits from it have largely been captured by the better-off. After the recent preparation of IEE/EIA reports, districts have started setting aside a budget for river works, but not yet for social protection or compensation. Rupandehi district has set aside a budget for Chure protection while Makwanpur district has allocated Rs. 4.8 million for river works. Similarly, Sunsari district has allocated Rs. 2 million for river training work. Kailali district has not allocated any resources for plough-back investments. Even in districts that have allocated such resources, the share is small compared to the recommended plough-back level of 30 percent. Sunsari district's allocation for river works and other environmental compliance activities is around 15 percent (Annex 2).

It is too early to assess the effects of the plough-back investments because the spendings haven't yet produced their potential returns. The districts have generally placed a high priority on road construction to improve connectivity, and even budgets from other sectors are being allocated towards road construction. Therefore, it is yet to be seen whether these budgetary allocations will be genuinely applied towards environmental management and social work, or whether they will be transferred to finance the construction of roads.

The total estimated cost of environmental management for Kailali district, according to the district's IEE report, is Rs. 1.28 million, whereas the potential annual tax collection is estimated at Rs. 6.16 million. Therefore, environmental management cost is estimated at around 21 percent of the potential tax income from the sub-sector. When the resource is priced, the environmental management cost will become an even lower percentage of the total revenue from the sub-sector. Additionally, there are other benefits, particularly in terms of providing direct full employment to about 1,000 people. Thus, local bodies have the potential to gain considerable amount of additional net revenue from SG&S sub-sector.

Conclusion

The study concludes that SG&S mining is beneficial for the country, provided that illegal practices are controlled through a stringent monitoring & supervision system that involves the local stakeholders, and by appointing a river warden. The cost of monitoring should be considered as a plough-back investment.

There is considerable evidence to prove that SG&S mining is beneficial for Nepal:

- i) All actors – except the poor manual crushers – in the SG&S value chain are realizing high incomes;
- ii) The economic returns are higher than the financial returns at all levels, meaning that the country and local communities are gaining more than the entrepreneurs;
- iii) Kailali's IEE report revealed that the environmental management cost is considerably low, at only about 21 percent of the potential revenue from the recommended safe extraction quantity;
- iv) Extraction of SG&S will help to maintain the bed level of the rivers, thus reducing the effects of annual floods; and,
- v) SG&S have been a significant source of revenue for about one-third of Nepal's districts, and these revenues are financing local development works.

There has been some tradeoff over time in the extent to which the sub-sector is pro-poor, largely due to increased mechanization – this, however, is inevitable if production and export are to be increased, because the availability of labour is declining while wage rates are increasing. To compensate for this, the government can finance other pro-poor initiatives from the enhanced revenues derived from the SG&S sub-sector.

The export of SG&S to India should be considered as an opportunity in the short to medium terms because:

- i) Our abundant and often wasted resources can not only generate income, but also bring in foreign currency in the form of Indian Rupees;
- ii) Such an opportunity may not be available after about 5 to 10 years, when India's broad gauge railway system is extended up to the Nepal border, because Nepali SG&S is at present competitive in price within 50 to 150 kilometers across the Indian border, but not in quality; and,
- iii) Bihar's current high growth rate, which is the impetus behind the high import demand for Nepali SG&S products, may not continue for an indefinite period.

The export ban of recent past, which lasted for about a year, affected 15 terai districts and one hill district. Average annual loss in local government revenue at that time was nearly Rs.1 billion. It should be ensured, however, that the raw materials are not exported directly. There should be maximum value addition within Nepal before SG&S resources are exported.

As has been mandated by the CA's Natural Resource Committee report, IEE/EIAs of district rivers should be the basis for environmental management plans before tax collection contracts and export permits are issued.

After the recommended 30 percent of SG&S revenue is ploughed back into river management and victim compensation, local governments are left with some Rs. 750 million to finance local development works. If this revenue source is lost, the central government will be forced to provide more grant resources to the districts.

Available IEE/EIA reports suggest that the potential safe extraction volume can be higher than what some districts are currently extracting and selling. In Kailali, it was higher by about 30 percent. This means the districts could increase their revenue without damaging their rivers.

It is also found that there are some environmental losses due to non-extraction. Rise in river-bed levels increase the effects of annual floods. Similarly, as seen in Lothar and Churia, the deposition of SG&S in rivers can lead to clogged bridges. The revenue foregone from non-extraction is another loss.

Major Recommendations

This study recommends to the Government of Nepal that:

- i) A stringent Act be promulgated and effectively enforced against illegal SG&S extraction, with a view towards ending the state of impunity;
- ii) GoN mandates the SG&S allocation for local markets; and,
- iii) GoN considers improving road design standards for bulk transportation of SG&S resources.

DDCs are advised to:

- i) Improve the sub-sector monitoring and supervision systems, using local communities and river wardens;
- ii) Plough back SG&S-derived revenues as investments in source river protection;

- iii) Demarcate river rights of way and safe extraction zones, as identified by the respective district IEE/EIA reports;
- iv) Implement IEE/EIA recommendations;
- v) Design and implement social mobilization packages for river side resource extractors; and,
- vi) Introduce a system of resource pricing and permits for extraction.

For SG&S entrepreneurs, the study recommends that:

- i) They redirect their compensation packages towards poor local communities;
- ii) They provide improved safety measures and insurance for their workers; and,
- iii) They allocate SG&S products for the local market.

Other recommendations include

- i) Practice controlled extraction from only one side of the river/stream;
- ii) Strictly follow basic technical and environmental principles during extraction and processing; and,
- iii) Carry out a more detailed study of this nature to understand the seasonal nature of the SG&S business.

1

BACKGROUND

1.1 Introduction

Sand, gravel, stones (SG&S), and other mined natural resources are the foundations of both the ancient and the modern world. The great structures and wonders of the world would not have been possible without these resources. However, the reckless use of these resources has also led to serious human and property consequences in many countries. Nepal, a mountainous country, has an abundance of SG&S resources which, if utilized judiciously, could help to shape Nepal's development and affluence. However, a balanced outlook on Nepal's SG&S sub-sector seems to be lacking. There are two extreme outlooks – one that tries to accumulate wealth at the cost of the environment, and the other which opts to keep the resources intact and untouched.

In this situation, it is imperative for the country to seek a prudent outlook on the sub-sector so that the undesirable extremes of “quick-and-dirty extraction” and “non-extraction” are substituted by “environmentally regulated extraction,” for which to become feasible, the sub-sector must be observed and studied thoroughly. Realising this, LGCDP/UNDP has awarded this study contract to Narma Consultancy (P.) Ltd. This draft final report presents the findings of the study.

Water is Nepal's most important natural resource. There are about 6,000 rivers and rivulets,

altogether covering a length of 45,000 kilometers. The total drainage area of these rivers is about 191,000 square kilometers, of which 74 percent lies in Nepal. The total average annual runoff is estimated at about 170 billion cubic meters. The low gradient levels of these rivers are the source of SG&S resources, which are in abundance in Nepal and can become an important source of revenue for the country's development.

after the promulgation of Local Self-Governance Act (LSGA 1999) and Local Self-Governance Regulations (LSGR 2000) SG&S are also a newfound source of revenue for many local governments like District Development Committees (DDCs), Village Development Committees (VDCs) and Municipalities. Through LSGA and LSGR, local bodies have been given important rights to tax, sell and regulate SG&S exports, the revenues from which are expected to help finance poverty reduction and inclusive/participatory local development.

Growing urbanization and enhanced infrastructure building in Nepal, as well as high import demand from neighboring Indian states, have increased the demand for SG&S. These building materials are extracted from terrace and river-bed mining in several riverine systems in Nepal.

The extraction of SG&S, however, has often been environmentally unsafe and practiced illegally.

Although prohibited, most of the sand in the past came from riverbed excavation mining. The sand found in Nepal is of good quality, except for some high levels of mica content, generally above 8 percent of the acceptable limit (see *Sayami et al*, 2007) The gravel from riverbeds and terraces, however, is of lower quality compared to gravel extracted from quarries.

1.2 Revenue Vs Environmental Costs

While the extraction of SG&S resources has been an important source of revenue for the local bodies for financing their development, it does have environmental and other costs associated with both extraction and transportation. Noise and dust pollution are common near the quarry and crusher plants, thus creating health hazards. People living in the vicinity of the quarries and crusher industries are generally afflicted with eyesores.

The national and local newspapers and media have frequently disclosed accidents in the SG&S sub-sector. Recently, five persons were killed after they were trapped in a landslide at a hazardously run sand mine at Duwakot of Bhaktapur district. Even after the tragedy, hundreds of their colleagues continued to work in hazardous sand mines with no safety measures. Two people died in Tinau river valley, Rupandehi district, after being buried when they were trying to extract sand from the riverbed.

The rivers are getting deeper due to over-extraction, and narrower due to bank encroachment by workers, making it difficult and expensive to build irrigation systems. Debris from sand and gravel blocks up drainage systems.

The upstream Churia hills are also badly affected due to SG&S extraction. The frequency and magnitude of landslides have increased considerably.

Roads that see dense traffic of heavy vehicles used to transport SG&S products to benefit from economy of scale in transportation are deteriorating rapidly, with large potholes on the road surface.

The CA Committee investigation has shown that some 570 kilometers of highway have been badly damaged, purportedly due to the movement of large trucks carrying SG&S. The subcommittee doing the investigation has estimated that the government has earned only Rs. 1 billion in the last two fiscal years from the export of sand and boulders while the estimated cost of road repair is nearly Rs. 11 billion. However, not all road damage can be attributed to the SG&S sub-sector because even larger vehicles carrying other cargoes also ply the same roads. The study team counted the total number of large vehicles and vehicles using the Thankot - Malekhu section of the Prithvi Highway and found that only 27 percent of the large vehicles using that stretch of the highway carried SG&S.

Illegal sand mining on the Bagmati and Bishnumati rivers has damaged crucial bridges in the capital city. While one of the 26 bridges in the Kathmandu valley collapsed recently, according to an assessment by Divisional Road Office (DRO), Kathmandu, three other bridges are also on the verge of falling down due to illegal sand mining near the bridges.

Because of the high profits, and in a bid to accumulate quick wealth, the business is being increasingly criminalized.

On the other hand, there are certain cases where non-extraction of these resources, due to policy or other factors, has led to foregone revenues with negative environmental consequences. For example, the policy of Chitwan National Park in Chitwan district to prohibit the extraction of gravel from the Lothar river has threatened the Lothar bridge because the area under the bridge is virtually clogged. Similarly, some one hundred million cubic meters of gravel, sand and mud, created by Himalayan geo-tectonics coupled with the monsoon regime, flow out of the Chatara gorge in mountainous Nepal every year. As the river slows down in the flat plains beyond the mountains, it deposits sediments, filling up the river's main channel. If this deposit is not extracted, the river overflows and creates a

new course, causing substantial threat to surrounding communities. The recent breach of the Koshi dam was due to the accumulation of fluvial debris.

In order to make the SG&S business a safe source of revenue to the local bodies and central government, some regulatory arrangements and policy reforms to minimize environmental damage are thus inevitable.

1.3 Issues

There are several issues with regard to the ownership, extraction and utilization of SG&S. These issues can be summarized as follows:

- ◆ How do the stakeholders perceive SG&S extraction and the use of heavy vehicles in mining rivers and transporting SG&S resources for export?
- ◆ There is overlap, ambiguity and conflict about who owns the resource and is entitled to extract or award contracts by levying charges. For example, while LSGA 1999 confers exclusive ownership of several district based resources including sand, gravel and stones to the DDCs, the Forest Act 1995 provides the same authority to the Ministry of Forest and Soil Conservation for the same resource lying within forest areas. A clear sense of who is responsible for riverbed quarry management is lacking.
- ◆ Are there commonalities in the SG&S extraction, movement, taxing, and resource valuing practices across districts and regions?
- ◆ Have poor households engaged in SG&S sub-sector been displaced due to technological developments, like the introduction of mechanized crusher industries?
- ◆ Is there a system for assigning zones for resource contracting and extraction?
- ◆ How has the ban on export of SG&S imposed by Supreme Court verdict affected the industry and the country?
- ◆ Is over-extraction and poorly directed extraction leading to negative, environmentally damaging and unsustainable outcomes, such as damage to productive infrastructure, which often have the greatest impact on the poor and the vulnerable?
- ◆ Do inappropriate SG&S transportation practices like overloaded vehicles, water dripping vehicles, open SG&S cargo, etc., exist that have damaged the road infrastructure? If yes, what is the extent and share of damage from SG&S transportation?
- ◆ Is there criminalisation and rent-seeking in what is a highly profitable economic sub-sector?
- ◆ Have those who have been negatively affected by extraction/use duly compensated?
- ◆ Has a reasonable portion of the revenue from sales of the resources been ploughed back into the sub-sector (rivers, forest, agricultural lands, settlements)?
- ◆ Have the resources been valued as per their real worth? Is the cost of their environmental and social externalities reflected in their market value and business operational cost?
- ◆ Are natural resources equitably distributed across the politico-administrative units?
- ◆ Who is profiting from the extraction of these natural resources? Government? Private companies? Communities? Men or women? Foreign investors?
- ◆ Are there effective monitoring mechanisms at various levels to ensure safe extraction?
- ◆ Are technical parameters used for planning and monitoring well researched?
- ◆ Has environmental degradation caused by the sector been adequately compensated?
- ◆ How sustainable are the current practices and extraction volumes? Is there a need for introducing stone quarries for the SG&S industries?
- ◆ What is the market potential for SG&S in the rural, urban, semi-urban and export sectors?
- ◆ Is there carteling in the SG&S business?

1.4 Rationale for the Study

The SG&S sub-sector has not been assessed in a comprehensive manner with regard to its potential as a source of revenue for the government, as well as with respect to the environmental and social costs of the industry. A better empirical and more grounded understanding of what is happening in the sand and gravel quarrying sector, with respect to revenues, management, and social and environmental outcomes is important. It is also necessary to

analyse the various factors – policy, capacity, fiscal and non-fiscal incentives, regulations, mal-practices, etc. – that underlie negative and positive outcomes in the sub-sector in order to devise a better policy and regulatory framework to maximise positive outcomes, to minimise negative outcomes, and to provide appropriate incentives for optimal behaviour. Recognising these issues, LGCDP/UNDP-UNEP, under the Poverty Environment Initiative (PEI) has awarded this study to Narma Consultancy (P) Ltd.

2

STUDY OBJECTIVE

The overall objective of the study, as per the Terms of Reference (see Annex 1 to this document), is to produce economic evidence on the economic, social and environmental impacts of current practices of revenue generation from the extraction and use of natural resources – especially sand, gravel, rock and stone in particular – and others of a similar nature in general, at the local level and to recommend ways for optimal generation and use of fiscal revenue for local bodies.

The specific objectives, however, are to:

- i) Assess the sustainability of current revenue generation practices for the extraction and use of natural resources;
- ii) Assess the economic, social and environment impacts of current practices of revenue generation from the extraction and use of natural resources with a focus on:
 - a) Economic valuation of environmental and social benefits and costs of such practices in selected LBs over the short, medium and long terms
 - b) Identifying good and bad practices through case studies, and analyzing how the revenues have been utilized or invested back in other assets or capital at the local level, for example, investment in sustainable ecosystem management;
 - c) Proposing specific ways to improve the long-term sustainability of such revenue generation and sharing practices through wiser rev-

enue generation and investment strategies targeting the different stakeholders, i.e. LBs and other related central government agencies; and,

- d) Disseminating and sharing information with central level planners and policy makers, LBs and the private sector about the weaknesses and strengths of present practices of revenue generation and sharing in the light of economic, social and environmental concerns.

The overall objective, specific objectives and the Study Team's interpretations of these in terms of tasks to be done are presented in Table 2.1.

The study team was asked to undertake an in-depth analysis of the potential for environmental and fiscal reform measures to achieve the multiple goals of:

Discouraging over-extraction of resources

- ◆ Generating revenues that can be reinvested into poverty reduction and environmental conservation, and contributing to the general government budget;
- ◆ Promoting the use of improved technology to control pollution;
- ◆ Providing health services to miners and their families, and to local communities;
- ◆ Supplying clean water and sanitation services to miners, families and communities; and,
- ◆ Creating a safer, cleaner physical environment

Table 2.1: Study objectives and interpretations

Objectives (as per terms of reference)	Study team's interpretations
Overall objective: " .. to produce economic evidence on the economic, social and environmental impacts of current practices of revenue generation from the extraction and use of natural resources such as sand, gravel, rock and stone mining and others of the similar nature at the local level and to recommend the ways for optimal generation and use of LBs fiscal revenue."	Document the impact of local taxes and charges levied on natural resource use and extraction; Document the outcomes/impact of the extraction/use of natural resources which are subject to local taxation and/or charges; and, Make recommendations on optimal ways of enhancing the generation and distribution of local government revenues derived from sustainable natural resource extraction/use
Specific Objectives (SO)	
SO1: Assess the sustainability of the current revenue generation practices for the extraction and use of natural resources	Assess the extent to which LB revenues derived from taxation on natural resource use are sustainable; and Assess the extent to which LB revenues impact on the sustainable use of natural resources , for instance, by contrasting the calculated losses in natural and social capital with the revenues generated from natural resource extraction and the investment of such revenues in local economy and local livelihoods.
SO2: Assess the economic, social and environment impacts of current practices of revenue generation for the extraction and use of natural resources with focus on: Economic valuation of environmental and social benefits and costs of such practices in selected LBs over short, medium and long-term; Identification of good and bad practices through case studies, and analysis of how the revenues has been utilized or invested back in other assets or capital at the local level, e.g. investment in sustainable ecosystem management	As in overall objective: Assess the ways in which LB revenues derived from natural resource taxation are re-invested at the local level; and, On the basis of the evidence, highlight good and bad practices associated with LB taxation of natural resource use.
SO3: Propose specific ways to improve the long-term sustainability of such revenue generation and sharing practices in the future through wiser revenue generation and investment strategies targeting different stakeholders, i.e. LBs and other related central government agencies	Make recommendations concerning optimal ways of raising and using LB revenues derived from the taxation of natural resource use; and, Make recommendations concerning ways of raising and using LB revenues derived from the taxation of natural resource use, which contribute to optimal economic, social and environmental outcomes.
SO4: Disseminate and share information with the central level planners and policy makers, LBs and the private sector about the weaknesses and strengths of present practices of revenue generation and sharing in light of economic, social and environmental concerns.	Produce targeted information and policy advocacy materials that can directly inform key national and sectoral policies, plans and programmes, on LB revenues from natural resources, particularly the SG&S, such as policy briefs, policy guidance; and, Disseminate findings, lessons learned and recommendations of the study.

A range of fiscal measures has also been explored as part of the policy recommendations, depending on its feasibility in the Nepali context, as below:

Tax on natural resource extraction

- ◆ Introducing a levy on resource extraction to ensure that incentives are not provided for over-exploitation;
- ◆ Helping cover environmental costs that are not currently covered by the tax regime; and,
- ◆ Using the resources generated to provide health and other services, and for environmental conservation.

Tax exemptions for the use of environmentally friendly technology

- ◆ As a strong incentive for mine operators importing environmentally friendly technology by giving tax exemptions and import duty rebates, and other incentives.

Reform of the tax structure

- ◆ To rationalize the current system of different taxes, royalties and rents collected by different levels of government as well as other charges and fees paid to various governmental departments.

3

METHODOLOGY

3.1 Broad Elements of the Study

The broad content and process of the study, based on TOR provided, have been as follows:

1. **Overview:** sub-sector chain and incentives – from production to consumption

Actors and actions – who does what and at what point in the sub-sector chain?

Incentive matrix – what are the aims of, and incentives for, each of the actors in the chain?

2. **Basic data:** production, consumption and regulation

Production and processing:

- ◆ from raw products to aggregates – techniques, quarry-to-market, numbers, etc.

Consumption:

- ◆ “census” of downstream actors and actions, and,
- ◆ the market: prices, structure and operations.

Regulation of:

- ◆ quarry “ownership”,
- ◆ rents on use, extraction and consumption,
- ◆ revenue streams, revenue collection and administration, and
- ◆ sanctions and incentives.

3. Outcomes for the winners, losers:

Immediate:

- ◆ producers and suppliers: income, expenditure, opportunity costs, etc.,
- ◆ consumers: value-for-money,
- ◆ regulators and managers: revenues, costs, finance, oversight, implementation’
- ◆ environmental: erosion, flooding, landslides, damage to infrastructure, biodiversity loss through loss of habitats and declining water quality, land , etc.,
- ◆ social: land and property losses, crops and livestock, livelihoods, violence and insecurity, etc.,
- ◆ levels of extraction,
- ◆ individual benefits and profits,
- ◆ methods of extraction, and,
- ◆ fiscal analysis: how do existing regulatory practices like rents, revenue administration and active management affect outcomes?

4. **Analysis II:** changing regulatory practices, altered/improved outcomes and implications, analysis of trends and forecasting.

5. **Analysis III:** how to change the rules of the game with regards to policy and regulatory environment.

3.2 Desk Review

The study started with a review of the relevant works and related data in Nepal and elsewhere. The review included, among other documents, LGCDP progress reports, Ministry of Finance archives of budget data, various related Acts and Regulations (existing but not implemented, implemented badly, implemented rightly and policy vacuum), local body data on revenue and expenditure, reports on poverty and social impact analysis of this sector, environmental reports, etc.

It has been noted that the Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) reports of potential rivers/streams have been prepared for each selected district, except for Rupandehi. These reports have been reviewed and data utilized to prepare resource potential, possible annual extraction amounts, and mitigation measures to be followed in the extraction.

Besides the above, a theoretical review of interesting events, laws, cases, which will have some lessons to learn for Nepal, has also been undertaken.

The *Republica* publication house at Sundhara, Kathmandu, and the *Kantipur* office at Subidhanagar, Kathmandu, were used as sources to search newspaper articles related to the exploitation of sand, gravel and stones.

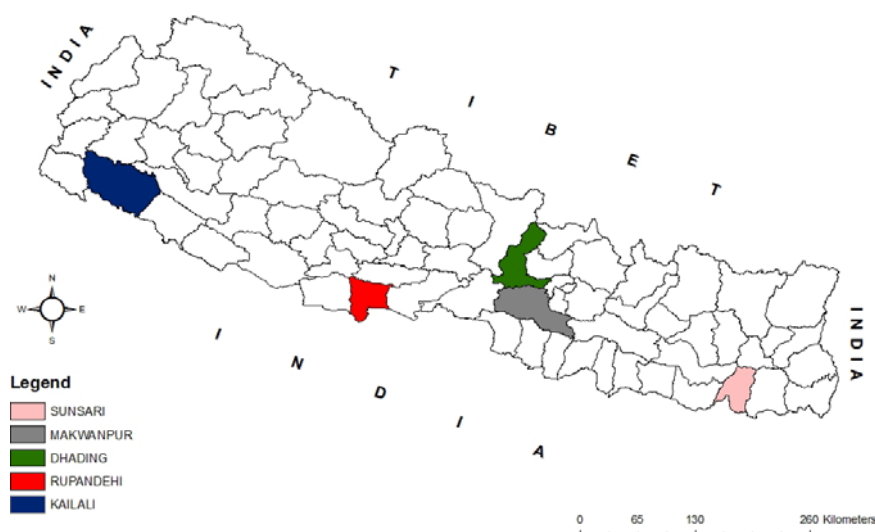
3.3 District Selection for Field Enquiry

As per the Request for Proposal issued by LGCDP, 5 districts, including 2 from the hills and 3 from the terai, have been selected for the study based on the following selection criteria:

1. Potential of sand, gravel and stone resources in the district;
2. Level of extraction of sand, gravel and stone, and the level of resources generated in the district;
3. Level of export of sand, gravel and stone from the district;
4. Level of supply to the largest domestic market (Kathmandu valley);
5. Most problematic district in terms of extraction and sales of sand, gravel and stone; and,
6. Regional representation.

Based on the above criteria, Kailali (criteria 1 and 6), Rupandehi (criteria 2,3 and 6) and Sunsari (criteria 3,5 and 6) were selected from the terai. Dhading (criteria 2,4,5 and 6) and Makwanpur (criteria 2, 3 and 6) districts from the hills were selected. The choice of these districts was endorsed by a meeting of MOLD/LGCDP, UNDP and the study team members, held on November 30, 2010. A map of Nepal showing the selected study districts is presented in Map 1.

Map 1: Map of Nepal showing the study districts



3.4 Data Collection

The data for the project have been gathered from both primary and secondary sources. The secondary sources consisted of data on fiscal revenues collected for natural resources from national data archives and local body income and expenditure records. The primary data were collected from interviews with local body officials, community organizations, NGOs working on environmental projects and other actors and stakeholders in the sub-sector value chain of the selected districts, like contractors, extractors, transporters, labourers, consumers, etc. Some measurements and estimations were also made to assess the annual regeneration levels of the relevant resources within the local body jurisdiction. For each extracted resource, time series data for at least 3 previous years on the level of extraction and the level of resource generation were collected. Checklists for different actors were used for the collection of information.

Both qualitative and quantitative data were collected. While quantitative data were collected as described above using enumerators, the qualitative data included opinions and perceptions of various related stakeholders. For this, Participatory Focused Group Discussion (FGD) tools were used. FGD is a semi-structured small group of between 4 and 12 persons, where consultation is used to explore community average data and parameters, attitudes, feelings, and preferences. It is a compromise between participant observation, which is less controlled, lengthier and more in-depth, and pre-set interviews. In FGD, representative sets of participants were chosen to discuss a limited number of focused questions or topics.

Observations on political mechanisms, political interests, rent-seeking and sources, extent of malpractices, state of impunity and the impact of these practices on the local bodies, central government and the local people were also done at different levels. An attempt was made to document site-specific resources in each district that have the potential but are not presently within central or local body tax nets.

The institutions and persons visited for data, information and opinions are presented in Table 3.1.

3.5 Data Processing

The data/information collected during the study were computer processed to arrive at condempirical statistics such as sums, averages, percentages, frequency counts, etc.

3.6 Data Analysis

3.6.1 Extraction Practices

The practices of revenue generation by the local bodies were split into the bad ones and the good ones, depending upon whether the environmental, social and poverty costs are positive or negative in the aggregate. Thus, this also included social impacts and concerns which examined the effects on poverty, gender, ethnicity etc. Bad and good practices are defined thus:

- i) **Bad practices:** When the estimated cost of environmental damage, to infrastructure, and others, per unit of resource extraction for each resource extracted is more than the amount of revenue raised from sales by companies and local bodies; and,



Consultations in district workshop mode in Rupandehi DDC Meeting Hall



Meeting to mediate in the dispute between Hariyali CF and Sunsari DDC



Meeting with the local people

Table 3.1: List of institutions and persons met for information

Who		Subjects Discussed
GoN	Ministry of Local Development Local Body Fiscal Commission	General context – policy, etc. Fiscal framework – revenue assignments, revenue trends, revenue data
	M. of Industry and M. of Commerce M. of Forest and Soil Conservation Department of Roads Department of Mines	General context – policy, regulation, etc. General context – policy, regulation, etc. General context – policy, market, etc. Resource inventory
	Ministry of Finance – JS Revenues)	General context – revenue policy, revenue assignments, revenue trends, revenue data
	National Planning Commission (Infrastructure Development Division) High Level Commission	General context – policy, economics, etc. General context – policy, problems, etc.
Political bodies	CA – NR committee members Political parties (national and local) LB Associations (Association of District Development Committees of Nepal, National Association of Village Development Committee in Nepal, Municipal Association of Nepal), Federation of Nepal Chamber of Commerce and Industry and local Chambers of Commerce, Federation of Community Forest Users Nepal.	General context – policy, federalism, etc. General context – clients, voters, etc. General context – LB perspectives on policy
Construction sub-sector	Quarry workers Sand/gravel suppliers Sand/gravel transporters Market middlemen Contractors (builders, architects, surveyors, etc.) Building owners, buyers and other consumers	Dimensions of sub-sector production and consumption
Rural society	Villagers (women/men, upstream,	Impacts and outcomes downstream, etc.)
Development Partners/ Projects	SDC (DRSP & Forestry) ILO Helvetas RAP/DFID GTZ World Bank ADB	General context – policy, etc.
Others	EIA experts Resource persons	General context – policy, etc.

- ii) **Good practices:** When the environmental cost is zero or negligible, which is to say, extraction does not exceed the annual rate of regeneration. Good practices also included the provision of appropriate compensation for the losers from the extraction process.

3.6.2 Environmental Assessment

Two approaches were used to assess the environmental costs and returns:

- i) Change in revenue approach; and,
- ii) Loss of earnings approach.

The former is generally the positive outcome while the latter is the cost to the society. There are two facets of positive and negative outcomes from environment: the positive or negative outcomes from the environment to the value chain actors and surrounding communities, and the positive or negative outcomes/effect on the environment from the actions of the actors. A matrix of the outcomes was prepared to document the precise effect heads for possible valuation purpose. The matrix form is given in the table 3.2.

3.6.3 Shadow Pricing and Financial and Economic Analysis

Economic analysis is related to the assessment of the economic performance of any investment scheme or project. It is performed with the help of the stream of costs and benefits involved in the said scheme or project. The analysis can be ex-post, i.e., after the scheme/project has been implemented and all benefits have been realised;

ex-ante, i.e., when an investment has only been conceptualised but has not yet been initiated; or, in between, where the implementation has begun or been completed, but the full benefit streams are yet to be realised and even some costs are yet to be borne. The cost and benefit streams are taken as net incremental income (net profit from activities minus the baseline net income), such that the streams represent the sole share of the given activity.

There are basically two types of economic analyses. **Financial analysis** shows the returns to investment to an entrepreneur calculated on the basis of the actual costs and actual prices (market prices) paid or received by the entrepreneur. **Economic analysis** shows the return on investment to society or nation, which in turn is calculated based on the costs or prices borne or received by the society or nation.

These costs or prices to the society or nation are known as the opportunity costs or shadow prices. The second is the special case of human labour whose financial price is the prevailing wage rate while the economic price (shadow wage) is the average annual rate which the labourer would have obtained if there were no new investment.

The average annual rate means that, if a labourer is employed only 6 months in a year, then his or her average daily wage rate would be half of what he or she would receive on a working day. Thus, there are basically four adjustments needed for converting financial prices into economic ones:

Table 3.2: The matrix form

Effects	Positive effects/outcomes	Negative effects/outcomes
From the environment to the value chain actors and surrounding communities:	Health benefits through a clean environment, Aesthetic value, and, Working opportunities for all.	Death and disability to the extractors, and Loss of life and property of common citizens.
From actors to the environment:	River works to control bank cutting, and Land saved from floods.	Illegal extraction from within 500 meters of existing bridges

- ◆ Adjustments for taxes and subsidies;
- ◆ Adjustments for import or export parity;
- ◆ Adjustments for opportunity cost; and,
- ◆ Adjustments for exchange rate risks and other market distortions.

The price must also be subjected to foreign exchange risks and market distortions, which is represented by the Standard Conversion Factor (SCF). In fully liberalised economies where even the exchange rates are determined by the market forces, the SCF correction is not required. In Nepal, the current value of SCF is taken as 0.95, with 5 percent exchange rate risk and other risks, after the semi-liberalization of the economy after 1990. Before that, an SCF value of 0.9 was used.

When multiple years of income and expenditure streams from an investment are involved, there are broadly two tools to evaluate the returns from the economic analysis – the Benefit/Cost Ratio (BCR), and the Internal Rate of Return (IRR). Both of these tools are used, where applicable, to compute financial and economic returns. For BCR analysis, the discount rate is taken as 10 percent which is the standard interest rate offered by the banks on time-bound deposits.

In the case of IRR, the process itself finds the discount rate at which the benefits and costs will be the same. The IRR becomes Financial (FIRR) if financial costs/prices are used, and the same becomes Economic (EIRR) if the economic costs/prices are used instead.

3.6.4 Trend Analysis

The available data have been analyzed to find trends for each resource extracted from the available time series information. The trend is given by the equation **Slope = (Data series, time series)** in an Microsoft Excel worksheet. Whenever the data allowed, following annual trends, among others, were evaluated:

- ◆ Total revenue and expenditure of local bodies from SG&S resources;
- ◆ Physical extraction of sand, gravel and stones; and,
- ◆ Environmental improvements or damages.

The expenditure part of the revenue was also analyzed to see if some compensatory welfare expenses have been made to those who have been the victims of bad revenue generation practices. Intensive discussions with all stakeholders were held, particularly at the district levels, to identify important issues, and solutions for these issues were discussed in workshops. Case studies of specific natural resources used for revenue generation were also done to identify, understand and explore good and bad practices.

3.6.5 Distributive Analysis

The income and expenditure pattern and benefit sharing arrangements are analyzed under this topic.

3.6.6 Value Chain Analysis

To understand the business more comprehensively, a value chain model of stakeholders was constructed to include the entire range from permits for extraction from the DDC, to the end-users. The roles, earnings, positive and negative outcomes, problems, suggestions from all different actors in the production and trade chain were recorded separately and analyzed. This helped in tracing the losers and gainers from SG&S resource extraction more appropriately. A schematised value chain matrix is presented in Table 3.3.

3.6.7 Relationship Analysis

To understand certain basic relationships among different variables, the relationship analysis were done. For example, why do some district export more sand and gravel, and why aren't others with similar potential doing so? This may be explained by the prices, distance to the source, like in Churia, quality of the material, etc.

The relationship analysis (linkages and revenue sharing) are also extended to vertical geographical dynamics, such as that between the hills (original source of materials) and the terai (major generators of resources) by delving into the issues of revenue sharing.

Table 3.3: Commercial sand & gravel extraction for construction – a schematised economic chain

Aspects	Production		Distribution		Consumption
	Extraction	Transformation	Wholesale Transport	Retail Transport	
Process	➤ manual labour ➤ industrial quarrying	➤ purification (washing sand & gravel) ➤ manual/machine crushing or hammering	➤ transport from production sites to wholesale market sites	➤ transport from production or wholesale market sites to construction sites	➤ use of sand/gravel as aggregates (concrete, road surfacing) ➤ use of gravel directly (road surfacing, ground surfacing)
Technology	➤ unskilled labour with simple tools (shovels, sieves) ➤ diggers or bulldozers	➤ sieves, cleaning pools ➤ hammers ➤ rock crushers	➤ motorised vehicles	➤ motorised vehicles ➤ coolies	➤ manual mixing of aggregates (with bitumen, cement, etc.) ➤ machine-mixing (concrete makers)
Location	➤ sand riverbeds, terraces ➤ gravel riverbeds, terraces	➤ riverbeds ➤ roadsides ➤ elsewhere	➤ rural roadsides ➤ urban areas	➤ urban areas	➤ construction sites (roads, building sites)
Requirements for Operators to Enter the Industry	➤ availability of labour and minimal equipment. ➤ labour contractors, working capital ➤ industrial capital (equipment, working capital)	➤ availability of labour and minimal equipment. ➤ Industrial capital (equipment, working capital)	➤ capital (equipment, working capital)	➤ capital (equipment, working capital) ➤ availability of coolie labourers	➤ capital (equipment, working capital)
Principal Actors	➤ local villagers ➤ non-local villagers ➤ entrepreneurs	➤ local villagers ➤ non-local villagers ➤ entrepreneurs	➤ entrepreneurs	➤ entrepreneurs ➤ urban labourers	➤ entrepreneurs and contractors ➤ building owners ➤ home-owners
(Non-labour) Commodity Markets	➤ n/a	➤ buy/sell raw materials for processing & transformation	➤ buy/sell transformed materials for transport to wholesale market locations ➤ buy/sell transformed materials for transport to construction sites		

Information Needed (by study location)	Production		Distribution		Consumption
	Extraction	Transformation	Wholesale Transport	Retail Transport	
Direct Unit Costs and Inputs	➤ labour (per m³) ➤ running costs (per m³) ➤ other costs (per m³)	➤ labour (per m³) ➤ running costs (per m³) ➤ other costs (per m³)	➤ labour (per m³) ➤ running costs (per m³) ➤ other costs (per m³)	➤ labour (per m³) ➤ running costs (per m³) ➤ other costs (per m³)	➤ n/a
Rents (Taxes, Charges, Tolls, etc.)	➤ for “entry” or access (per m³) ➤ for sales/purchase ➤ other	➤ for “entry” or access (per m³) ➤ for sales/purchase ➤ other	➤ for “entry” or access (per m³) ➤ road tolls ➤ for sales/purchase ➤ other	➤ for “entry” or access (per m³) ➤ road tolls ➤ for sales/purchase ➤ other	➤ n/a
Prices	➤ price of un-processed sand/gravel (per m³) at point of extraction	➤ price of processed sand/gravel (per m³) at point of transformation	➤ price of processed sand/gravel (per m³) at point of onward sale		
Seasonal or Other Patterns in Production, Distribution or Consumption	➤ shifts in extraction sites ➤ fluctuations in output from extraction sites	➤ shifts in transformation sites ➤ fluctuations in output from transformation sites	➤ fluctuations in quantities transported	➤ fluctuations in quantities transported	➤ fluctuations in use of aggregates
Impacts, Indirect or Deferred Costs	➤ immediate site of extraction ➤ upstream ➤ downstream	➤ immediate site of transformation ➤ upstream ➤ downstream	➤ impacts etc. on transport networks and environs ➤ impacts at stock-piling sites ➤ impacts on sites of construction		
Economic Incentives for Actors	➤ location for extraction ➤ seasonal incentives ➤ other	➤ location for transformation ➤ seasonal incentives ➤ other	➤ points of stock keeping and transport ➤ loading levels ➤ other		

3.6.8 Case Studies

Interesting events and facts revealed during the course of the field study were explored in depth using the case study methodology and reported in Case Boxes. Case analysis followed a 4C methodology (Context, Content, Critiques and Conclusion). The cases evolve under certain context and there is body of case called content (statement of a sequence of facts) from which analytical conclusion is derived for lesson learning.

3.7 Study Limitations

The study has certain limitations and hence the study results should be taken cautiously in the light of these limitations. Firstly, there were

some data problems due to aggregated estimates and responses related to the nature of the business. The parameters are also not well refined because the sub-sector is a relatively new industry. Secondly, the study was completed over a short period. Thirdly, the discussions in the field were very cautious, owing to a pervasive sense of threat to personal security stemming from the criminalization of the sub-sector. Fourthly, the study timing almost coincided with the district council meetings, so that senior district officials were often not available. Fifthly, strikes and *bandhas* organized by different protesting groups also frequently disrupted the study. And lastly, more attention had to be directed to the grudges and furies of the crusher industry entrepreneurs who were facing an export ban at that time.

4

SG&S SUB-SECTOR : SITUATION AND PRACTICES

4.1 Historical Review of the Subsector

The history of the sub-sector can be broken up into three stages with some obvious overlaps:

1. Old conventional system;
2. The period of boom and technological changes; and,
3. The phase of virtual demise.

4.1.1 Old Conventional System

Until around 1977, people met their demand for sand, gravel and stones on their own and with the help of petty traders of these products.

Since fiscal year 1977/78, the then Government of Nepal made arrangements to lease, license and exploit these resources from mines and rivers under the supervision of local bodies. Simple extraction technologies were used. Manual crushing was practiced in a massive way in the riverbeds and on road sides by poor and landless labourers. Crushing technologies were restricted to large construction sites only. Although taxes on the extraction and use of these resources were introduced, they were very nominal. The following norms were applied for the exploitation of sand:

1. Five meters must be left on both banks of a river while exploiting sand from the river, and excavation could be done only up to a depth of 1 metre;
2. No excavation should be made within a radius of 200 metres from any infrastructure;
3. Authorized permits must be submitted from the concerned persons or agencies if roads are being used to the mining sites;
4. Leaseholders must submit information about progress and product quantity to the concerned institution;
5. Product of the quarry must give priority to local demand; and,
6. The concerned authority must give information regarding leased and licensed area to the Department of Mines and Geology within 35 days of the date of license issue.

After 1991, the Government banned river mining. Commonly, miners used excavators to dig a channel during the pre-monsoon season, so that sand could be collected in the ditches during the monsoon between June and September. Along the channel, bamboo nets were built in several rows to retard discharge of sand downstream. In addition, diversion channels were dug for trapping sand in the ditch and for collecting water in the floodplain to wash sand. After the

monsoon period, different sieves were used directly in the channel to separate gravel and sand. Generally, domestic tools like shovels, *twangros*, bamboo buckets, sieves and water pumps were used for riverbed mining.

In 1999, the Government of Nepal promulgated LSGA, followed by LSGR in 2000. LSGR conferred full ownership of the resources on the local bodies, to be managed, administrated, shared and utilized by the DDCs. Before this, the Forest Act, 1993, had given the rights to the resources lying within the jurisdiction of the forest areas to the District Forest Offices. The two acts contradict each other, leading to disputes in several districts. This issue is dealt with later in this report. After the implementation of LSGA, the local bodies used taxes on SG&S resources as a major source of revenue. Tax collection contracts were mostly awarded through a complete bidding process to private sector contractors. Revenue collection was also carried out through the *amanat* system of direct tax collection by DDC staff, but only when no bids were offered by outside contractors. By this time, the trade treaty between India and Nepal had recognized SG&S as a major Nepali export item. To take advantage of the export market, and to increase revenues, the terai districts began to export even the raw materials without any extra value-adding processing. For example, there existed 9 large crusher industries in Nautanawa, India, to process Nepali raw materials. Heavy equipment such as excavators began to be imported and used to extract larger quantities for higher revenue.

4.1.2 The Period of Boom and Technological Changes

From about 2008, with the beginning of an economic boom in neighboring Bihar state of India, the prospects for SG&S exports from Nepal brightened enormously. The private sector seized the opportunity for SG&S exports. The demand for construction materials was growing even within Nepal. This called for a major change in technology within the SG&S sub-sector. Beginning from small units, progressively larger

crushing units, including a few fully digitized and automated systems, were established by the private sector with licenses from the government.

This boom lasted for about two and half years until the ban on exports was implemented by GoN through a Supreme Court verdict of January 2, 2010. Those industries which were established early on were able to profit from the booming export opportunity. By this time, an estimated Rs. 40 billion rupees worth of private sector investment had already been made with more than 60 percent involvement of the banking and financial sectors. Before the ban, about 90 percent of the products from terai districts was sold to India, with annual export earnings of over Rs. 60 billion (estimates from Ad hoc Committee of Crusher Industries). About a year ago, in early 2010, the Natural Resources Committee of the Constituent Assembly ruled that the districts could not proceed with sales of SG&S products unless:

- ♦ An IEE/EIA report is prepared as per the legal guidelines and formally endorsed by the appropriate government channel; and,
- ♦ The district prepares plans for extraction, sales and export and an implementation plan is prepared as per IEE/EIA findings and suggestions.

Following this, the districts began to prepare their IEE/EIA reports.

4.1.3 The phase of virtual demise

The export ban has now been lifted, but while it lasted, the export based industries, mainly located in terai districts, were fully paralyzed and faced rapidly deteriorating financial conditions. The huge investments made earlier was almost turned into a sunk cost. Although some industries continued to operate in the hope that the ban would soon be lifted, many industries laid off their employees and either fully closed, or were operating at a very much reduced scale. The ban has finally been lifted with conditions to fully comply with the CA Committee mandate to carry out the environmental study and implement the findings.

4.2 Stakeholders and Their Problems/Perceptions on SG&S Sub-Sector

The stakeholders in the SG&S sub-sectors are the local bodies like the DDCs, VDCs and municipalities, crushers industry entrepreneurs, workers, private raw materials extractors, transporters, SG&S dealers and the end consumers. The

roles, stakes and problems/perception of different direct stakeholders are presented in table 4.1.

In addition to these direct stakeholders, there are several other indirect stakeholders who are also impacted by the SG&S sub-sector. For example, heavy equipment sellers cannot sell their equipment if the use of heavy equipment is banned in SG&S extraction.

Table 4.1: Matrix showing roles, stakes and perceptions of different direct stakeholders

Stakeholders	Roles	Stake	Problems/Perceptions
MoLD	Policy formulation Expenditure Monitoring	Policy failure	Policies are not being implemented properly
DDC	Bidding for SG&S sales Monitoring the SG&S contracts Monitoring the extraction process as per guidelines Generating revenues from SG&S extraction and transport Coordination with all stakeholders Development financing and poverty alleviation from SG&S revenues Carrying out river protection and environmental management	Revenue loss Environment degradation	Potential contractors are carteling Huge demands for donations
VDC	Assisting DDCs	Revenue loss Environmental degradation	Huge demands for donations
Crusher industries	Value addition through processing using environmentally sound techniques Pay SG&S taxes Domestic sale or exports Assist local communities and affected parties	Business loss	Government's biased policy Huge demands for donations Sense of security threat Labour union activities
Transporters	Transport raw materials and final products from site to market	Business loss	Uncertain availability and increasing price of fuel Police harassment Unnecessary donations
Industry workers	Provide labour for processing	Job insecurity	Very low wages
Manual extractors from rivers	Extracting resources from river side Small scale processing	Declining earnings	Displacement due to the use of heavy equipment
DFO	Coordinating with DDC in SG&S extraction and sales	Revenue generation Forest protection	Conflict with DDC over ownership and revenue sharing
DADO		Loss of agricultural land	
DIO		Problems in irrigation systems	

4.3 Value Chain in SG&S Sub-sector

With the growth in the number of stakeholders, the value chain has also been lengthened. Two value chain models – one for the *amanat* system, and the other one for the tax contract system are shown in figure 4.1

In the second contracting system also, processing and wholesaling arrangement is exactly similar to that in the first *amanat* system. The end-users are Nepali buyers of SG&S products and even the Indian buyers. However, the Indian end-use of Nepali SG&S products has not been well documented.

4.4 System of Revenue Generation

Data on local government revenues in Nepal is generally patchy, out-of-date, often incomplete and sometimes inconsistent – this is by no means unique to Nepal, and is frequently the case for many other countries. This needs to be borne in mind while studying the following sections.

4.4.1 Local Government Finance: an Overview

Local government revenues and expenditure in Nepal make up a relatively small proportion of all public expenditure and revenues. Table 4.2

Figure 4.1: Value chain models in SG&S subsector

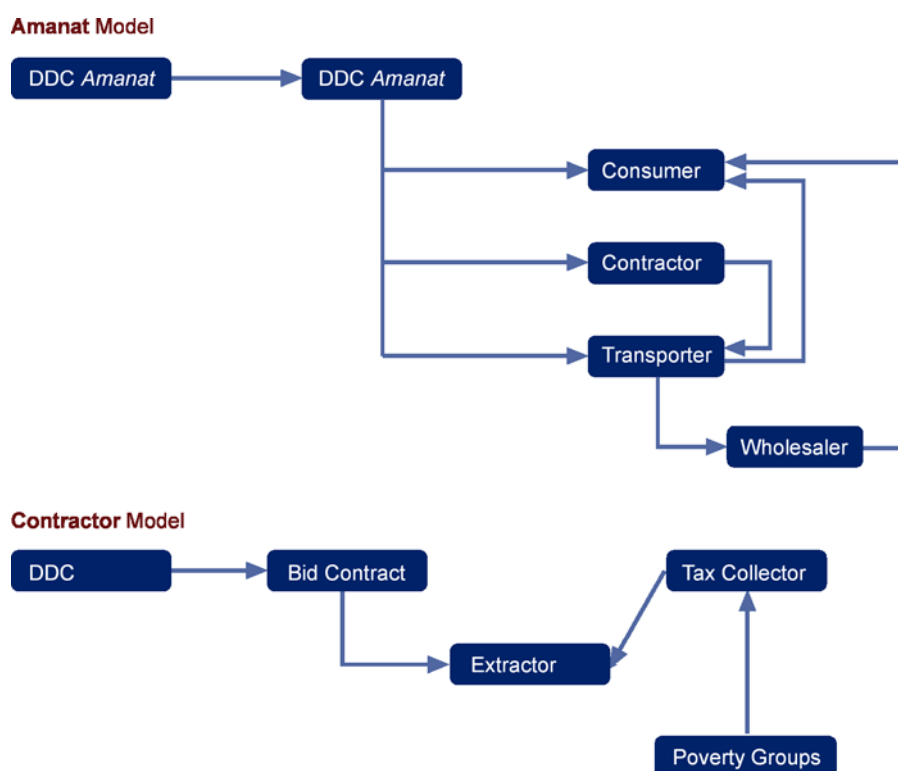


Table 4.2: Local government revenues and expenditure relative to GDP and total public expenditure and revenues

	FY (%)		
	FY 1998-1999	FY 1999-2000	FY 2000-2001
GDP			
Share of CG in GDP	21.12	21.13	23.34
Share of LG in GDP:			
> all LBs	0.83	0.77	0.71
> DDCs	0.20	0.19	0.17
> Municipalities	0.04	0.04	0.03
> VDCs	0.59	0.53	0.50
Total public expenditure			
Share of LG in total public expenditure:			
> all LBs	4.62	4.24	3.37
> DDCs	1.09	1.05	0.84
> Municipalities	0.24	0.23	0.18
> VDCs	3.29	2.96	2.35
Total revenues			
Share of LG in total revenues:			
> all LBs	7.39	6.55	5.66
> DDCs	1.74	1.63	1.41
> Municipalities	0.39	0.35	0.30
> VDCs	5.26	4.57	3.94

Source: Shrestha (2002)

provides data from 1998-2001, and shows that LG expenditures accounted for less than 5 per cent of total public expenditure and about 6 per cent of total revenues. For the same period, LGs accounted for less than 1 per cent of GDP. LGs are, therefore, relatively small players in public finance.

Local government revenue sources—overall

Tables 4.3 and 4.4 on the following pages provide some general information on revenue sources for local governments. Figure 4.2 (below) provides a graphic summary of revenue trends for local governments.

As can be seen from the tables 4.2 and 4.3 and figure 4.2, local government own-source revenues over the period 2001-06 have generally declined as a proportion of total revenues. However, in absolute terms (see table 4.2), own-source revenues have remained relatively stable – what has changed is the proportion of LB revenues

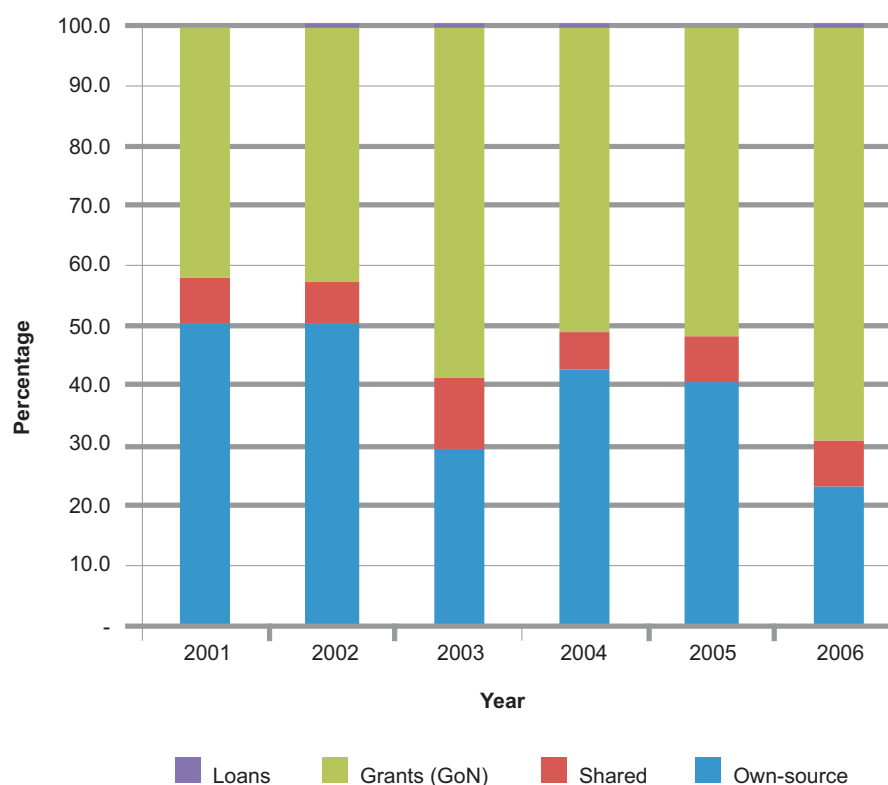
derived from GoN grants, which have increased over time, and very dramatically since 2006-07¹. Although more recent data are not available, GoN policy has maintained a commitment to relatively high levels of centre-local transfers. As a result, own-source revenues almost certainly continue to make up a historically low proportion of total revenues.

Local government own-source revenues

Local government own-source revenues in Nepal are derived from a wide range of taxes, fees and charges – property tax, service charges on LG assets and services, various sales, and, very importantly, resource taxes, on forestry, SG&S, etc.

There is evidence, albeit patchy and scattered, that local government revenues derived from taxes levied on natural resources, like forest products, SG&S, etc., make up by far the largest proportion of local government own-source revenues. Table 4.4 (below) provides a summary of

1 Although the real value of own-source revenues has probably declined if inflation is taken into account.

Figure 4.2: Local government revenue sources (2001-2006)**Table 4.3: Nepal: local body (LB) revenue sources (2001-2007)**

NRs 000,000s

LB	Revenue item	FY					
		2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
VDCs	Own source	766.0	479.6	434.7	534.7	429.5	711.1
	Grants	1,620.0	1,572.0	2,215.1	2,007.5	2,189.8	4,166.6
	Total	2,386.0	2,051.6	2,649.8	2,542.2	2,619.3	4,877.7
Municipalities	Own source	1,368.7	1,707.9	1,765.5	1,933.5	1,867.9	1,946.4
	Grants	-	23.3	28.8	705.7	655.6	1,099.4
	Loans	-	2.6	2.6	2.4	3.9	4.7
	Total	1,368.7	1,733.8	1,796.9	2,641.6	2,527.4	3,050.5
DDCs	Own source	614.4	560.8	325.7	492.6	518.0	909.1
	Shared revenues	417.7	388.3	1,005.9	390.3	539.0	1,099.4
	Grants	663.4	747.0	2,736.3	826.5	765.9	5,325.2
	Total	1,695.5	1,696.1	4,067.9	1,709.4	1,822.9	7,333.7
All LBs	Own source	2,749.1	2,748.3	2,525.9	2,960.8	2,815.4	3,566.6
	Shared revenues	417.7	388.3	1,005.9	390.3	539.0	1,099.4
	Grants	2,283.4	2,342.3	4,980.2	3,539.7	3,611.3	10,591.2
	Loans	-	2.6	2.6	2.4	3.9	4.7
	Total	5,450.2	5,481.5	8,514.6	6,893.2	6,969.6	15,261.9

Source: Sharma & Muwonge (2009)

**Table 4.4: Composition of local government own-source revenues
FYs 2001/02 and 2002/03 data for 62 DDCs**

Revenue item	Average (000,000s NRs)	% of total OSRs	% of total OSRs and shared revenues
Own-source revenues			
Infrastructure usage	116	1.4	0.8
Resource taxes (forestry, mines, etc.)	5,911	70.5	41.8
Service charges	285	3.4	2.0
Fees	374	4.5	2.6
Land revenues	489	5.8	3.5
Sales	294	3.5	2.1
Property sales	166	2.0	1.2
Other	747	8.9	5.3
Total	8,382	100.0	59.3
Revenue sharing (with central government)	5,760		40.7
Total	14,142		100.0

Note: OSR = own-source revenue

revenue sources for 62 DDCs. From the table, it can be seen that just over 70 percent of all own-source revenues for DDCs, underlining the overall fiscal importance of natural resources to local governments. Resource taxes on SG&S probably account for a significant proportion of all resource taxes.

Local government taxes and charges on SG&S

Unfortunately, data on SG&S taxes across all DDCs are not available. It is thus not possible to provide comments on the overall importance of these taxes/fees to DDCs as a whole. There is nonetheless evidence to the effect that the importance of revenues from SG&S taxation/fees varies considerably from one DDC to another. 2007 data on revenues in Kathmandu and Gorkha districts (see Shrestha 2009) show that SG&S taxes accounted, respectively, for 41% and 2% of total own-source revenues— Kathmandu DDC is thus highly dependent on SG&S taxes, while Gorkha DDC is dependent on other sources of revenue.

Fiscal data from the current study confirm that SG&S taxation accounts for a highly variable proportion of own-source revenues across DDCs. In some DDCs, taxes on SG&S account

for a small proportion of total revenues – both own-source and in the form of GoN grants. For the four-year period from 2006 to 2010, SG&S tax revenues accounted for less than 10% of annual DDC income in Sunsari. In Kailali, such revenues made up a relatively small proportion – between 1% and less than 10% – of total annual DDC income. However, in other districts, taxes and export permits levied on SG&S account for a much higher proportion of total DDC revenues – in Rupandehi, they accounted for 16.7% to 20.2% of total annual DDC revenues in 2008-09 and 2009-10; and in Makwanpur, for the same years, for 32.2% and 22% of total annual revenues.

The relative importance of SG&S taxes and revenues from the issue of export permits varies from one DDC to another – and is obviously closely correlated with the proximity of the DDC in question to India, by far the sole export market for SG&S. In many terai districts like Rupandehi, Makwanpur, exports to India account for up to 95% of the total market for SG&S. Revenues from export permits are thus correspondingly important in contrast to regular taxation on SG&S. In other districts such as Dhading and Sindupalchok, where the principal markets for SG&S are domestic, export permits are of no fiscal importance to the DDCs.

That revenues derived from taxes on SG&S are highly variable from one DDC to another is not surprising. Although almost all DDCs in Nepal are probably endowed with significant SG&S resources, only in some DDCs are these resources commercially exploited – either because of nearby urban or export demand and/or because road networks allow ready access. On the one hand, those districts that are either far from urban markets or largely inaccessible are unlikely to be able to generate significant revenues from SG&S taxation. On the other hand, districts that are close to urban/export markets or which are readily accessible by road are able to generate revenues from taxes on SG&S.

There is also patchy evidence from this study that DDC revenues derived from taxes/charges on SG&S have, until recently, been increasing over time. However, that upward trend appears to have been reversed since 2010, especially in the Terai, where the Government's ban on SG&S exports to India has squeezed DDC revenues from taxes and export permits. The available data does not, however, allow this study to determine whether revenues from SG&S in "non-exporting" DDCs such as Dhading or Sindupalchok have continued to increase or not.

Summation

In the overall scheme of things, local government finance in Nepal is a bit player, accounting for less than 6% of all public expenditures and revenues. But, within the more limited universe of local government finance, it is clear that revenues derived from SG&S are an important source of income for local governments, not just for DDCs, but also for VDCs and municipalities, which receive a share of such revenues.

4.4.2 Sand/Gravel Taxes: Revenue Administration

What is being taxed or charged ?

A first key point to note about local government taxes on sand/gravel extraction is that they are, in fact, taxes on the commercial transportation of sand/gravel – and, indeed, not all commercial transportation, but that portion of it which re-

sults in the "export" of sand/gravel from a given tax collection port. This is important to note – such taxes are not levied on sand/gravel extraction *per se* and are not levied at the point of extraction, except in the buffer zones of the protected areas. For example, Rs.1.73 per cubic feet is charged at site in the buffer zones of Makwanpur district by the Protection Office at the time of extraction. Taxes are levied on vehicles which transport sand/gravel out of a given local government jurisdiction, as well as SG&S which is commercially transported within that jurisdiction.

DDCs also charge for the issue of export permits for SG&S. Again, this is levied on SG&S that is being commercially transported out of Nepal – and, for all intents and purposes, constitutes a surcharge on "regular" taxation levied at the point of export.

4.4.3 Revenue Administration: Tax Farming and the Amanat System

A second key feature of the system by which such sand/gravel taxes are administered is that tax collection is almost invariably out-sourced to the private sector except in cases when no bidders are willing to place bids. DDCs generally use a system of tax farming or privatized tax collection to collect taxes on commercial sand/gravel transportation. Tax farming is the term used to describe a revenue collection system that dates back to the Republic of Rome, and which has been used by various states throughout history (see Box 1).

Tax farming is a contractual arrangement between a local government and the private sector, whereby the latter provides the former with a service, for which it is paid. In return, the private agent is entitled to make some kind of surplus out of which operating costs are financed, and profit, provided that it meets its financial obligations to the local government. Box 2 describes the way in which Sindupalchok DDC out-sources the collection of sand/gravel taxes to tax farmers.

Under such tax farming arrangements, DDCs are not involved in the day-to-day management of levying taxes on sand/gravel. A sample bid information of Kailali district (Khutiya river) is presented in Table 4.5.

The three year data on bidding practices show that bid values grew at a very high rate – almost 50% in a single year – from FY 2064/65 to 2065/66. This coincided with the export boom period. In the succeeding year 2066/67, the bid value was reduced by a small amount. The formal data were not available for the recent period but informal discussions revealed that bid values dropped drastically due to the ban on exports. The DDC reported that private sector bidders have been practising the cartel system in bidding, which reduces the revenue for the DDC.

Box 1: Tax Farming: As Old as Rome

"Tax farmers purchase contracts to collect revenue in a given area and time period. ... The tax farmers, if they have calculated correctly, ... make a profit on what they are legally entitled to collect... They are profit maximizers engaged in a business proposition and will not seek contracts if they are not reasonably certain of gain from them. Usually, tax-farming contracts are given out through auctions. Rome began to use tax farming in the third century B.C."

Several forms of tax farming have been practised in a wide range of political and historical settings, among others: Ptolemaic Egypt; the Mughal Empire (the *zamindari* system); 17th and 18th century France; early modern England; modern India and Bangladesh; modern Tanzania and Uganda.

Source: Levi (1988)

Box 2: Sand/Gravel Tax Farming in Sindupalchok District

Sindupalchok district lies to the north of Kathmandu. Two major river systems (the Sun Koshi and the Melamchi) run through the district; their valley floors are major sources of sand and gravel for Kathmandu Valley's construction industry. Sand and gravel from both river valleys are accessible by two motorable roads. Sand and gravel extraction in the two river valleys is carried out either manually or mechanically. In both valleys, but especially the Melamchi valley, industrial gravel crushers are used to break gravel up into calibrated aggregates.

Taxes are levied on all trucks transporting sand/gravel on their way out of Sindupalchok and on their way to Kathmandu, with total taxes based on the volume of sand/gravel (NRs 1.5/foot³). Tax collection is the responsibility of individual private sector contractors, selected on the basis of public procurement procedures. In the case of Sindupalchok, there are two annual procurement packages – one for the Koshi valley and one for the Melamchi valley. These two tax collection "packages" are tendered out by the DDC, which calculates a minimum "floor" bid (i.e. the minimum acceptable bid) – for 2010-11, the "floor" for the Koshi valley package was NRs 3 million, and for the Melamchi package was NRs 5.5 million. These "floors" are what the DDC assumes to be the minimum amount of tax revenue that can be generated – and are presumably calculated on the basis of the assumed minimum volume of sand/gravel that is likely to be extracted from each river valley. Interested contractors place their bids and, all things being equal, the tax farming contract is awarded to the highest bidder. For 2010-11, both tax farming packages in Sindupalchok were awarded to the same individual, who submitted bids of NRs 4 million and NRs 7.8 million for the Sun Koshi and Melamchi packages, respectively. The tax farmer and the DDC have signed contracts for 2010-11, specifying the payment schedule for the contractor including extra 13 percent VAT. The tax collection contractor, or tax farmer, is legally entitled to retain as profit any and all tax revenues over and above the agreed payments to the DDC.

The actual process of sand/gravel tax collection in Sindupalchok is simple – on each of the two roads leading out of each river valley, the contractor has established a tax collection point, manned by 4 staffs working on rotation basis. Trucks laden with sand/gravel stop at these revenue collection points, pay the taxes due on the sand/gravel they are transporting, and are provided with a receipt. The tax rate is set by the DDC, in accordance with the provisions of LSGA/LSGR.

Source: Field notes, December 2010/January 2011

Table 4.5: Bid Information for Kailali District

District	River	Particulars	2064/65	2065/66	2066/67	Slope	Slope (last two years)
Kailali	Khutiya	Bidding amount (Rs.)	875,000	1,252,778	1,250,250	187,625	(2,528)
		Contingency (25%)	218,750	313,195	312,563	46,906	(632)
		Total (Rs.)	1,093,750	1,565,973	1,562,813	234,531	(3,160)
		Equivalent quantity (m3)	10,938	15,660	15,628	2,345	(32)
		DDC Rate (Rs/m3)	80.00	80.00	80.00	-	-
		Total contractor cost (Rs/m3)	100.00	100.00	100.00	-	-

Source: Kailali DDC, 2009/10

Revenue administration: “amanat”

Although tax farming arrangements appear to be the preferred option for DDCs, they sometimes have little choice but to opt for direct revenue administration, known as *amanat*. Even with SG&S taxation, DDCs may have to use the *amanat* system when local contractors are unwilling to bid on tax farming contracts or when the bidding process is perceived to have become highly collusive.

4.4.4 Some Issues in sg&s Revenues

In looking at DDC revenues derived from taxes/charges on SG&S, a number of issues are worth exploring and discussing in more detail.

Purpose of SG&S taxation

To what extent is DDC taxation of SG&S a “regulatory” instrument, aimed at controlling or structuring the consumption and use of SG&S, in ways similar to, for example, taxes on tobacco or alcohol? On the ground, it seems clear that DDC officials do not see SG&S taxes as such – for DDCs, taxes on SG&S are seen as fiscal instruments for increasing local revenues, rather than as a mechanism for limiting or directing SG&S extraction. Indeed, it can be argued that DDCs use SG&S taxes as a way of raising own-source revenues and as a means for extracting rents – the level of revenues raised is largely a function of the supply of and demand for SG&S.

Moreover, the tax rate that is levied is relatively low – representing less than 3% of the total commercial value of a given volume of SG&S – and thus probably only has a very minor bearing on consumption/production². In other words, SG&S taxes are unlikely to constrain consumption and production. SG&S taxes are also levied at the point of transport, i.e., after production and about one-quarter way through consumption, rather than at the point of production. This would imply that they have little impact on production rates or practices. In short, it would be safe to assume that local government taxation of SG&S has very few, if any, regulatory functions. It should, therefore, be seen simply as a way by which DDCs raise own-source revenues.

Given this, the role of these taxes in the management of SG&S resources needs to be examined from the point of view of how they are spent – are the revenues derived from SG&S taxes used to finance investments in SG&S management or to contribute to socio-economic development in general?

Legal and regulatory issues

During the course of this study, the issue of conflicts and overlap between LSGA and other legal instruments has often been raised by national stakeholders. The most frequently cited case is the potential conflict between LSGA and the Forest Act (1993, and amended in 1995), which may be interpreted as contradicting each other. Un-

2 This is in striking contrast to “sin” taxes levied on cigarettes and alcohol in many OECD countries. In the UK, for example, the total tobacco tax “burden” (excise duty plus VAT) accounts for 90% of the value of the cheapest cigarettes. Such high levels of taxation on tobacco are not only intended to discourage smoking, but also to raise significant revenues. (see: <http://www.the-tma.org.uk/tma-publications-research/facts-figures/uk-tobacco-market-summary/>)

der the provisions of the Forest Act – which applies to all forested land in Nepal – forest products are defined as including “boulders, soil, stones, pebbles, sand”. Thus Forest Act provisions that apply to the use or extraction of forest products in general also apply to SG&S in particular. There is, then, a potential conflict between the provisions of LSGA and the Forest Act insofar as the two laws may specify different regulations about the use/extraction of SG&S.

In practice, however, the problem does not appear to be serious – and when problems do emerge, local officials usually find ways of resolving them. Moreover, if there is a problem of regulatory overlap, it is much more likely to concern SG&S extraction (site of extraction, period, etc.), rather than one related to taxation or revenues.

Revenue issues

Revenues

Available evidence shows that taxes related to the extraction of SG&S constitute a variable but often significant proportion of overall DDC revenues. Indeed, in some DDCs, it would seem that such taxes make up the largest proportion of own-source revenues. This is important to note, if only because it implies that – viewed from a fiscal perspective – sand and gravel are strategically important natural resources. Any operationally viable ways of improving the collection of SG&S taxes, then, are likely to be replicated and scaled up. On the other hand, any measure – however environmentally or socially desirable – that might lead to decreases in such revenues is unlikely to gain much traction.

Own-source revenues for DDCs

The absolute, or relative, value of revenues derived from taxes on SG&S extraction is actually increased because they are own-source revenues for DDCs. For DDCs, own-source revenues are the fiscal resources over which they enjoy almost total discretion in terms of use (within the limits of LSGA and its overall provisions with respect to local government functions and mandates). DDCs can use the revenues they obtain from

SG&S taxes to cover any and all legitimate expenditures – salaries, operations, investments, etc. Unlike block grants, which are inevitably ring-fenced for certain types of expenditure, or sector/conditional grants, which are clearly earmarked for specific expenditure items, the use of own-source revenues is almost entirely at the discretion of local officials. This makes SG&S taxes even more strategically important from the local perspective.

Revenue-sharing arrangements

According to LSGA, between 35 and 50 percent of DDC revenues derived from SG&S taxes are expected to be shared with “concerned” VDCs, municipalities, DFOs, and where applicable, Buffer Zone Committees. Although LSGA is not specific about how DDCs should identify “concerned” VDCs/municipalities, evidence from the field indicates that some – but not all – DDCs interpret this as meaning those VDCs or municipalities within whose jurisdictions SG&S has been extracted. Thus, in the case of Sindupalchowk DDC, 40 percent of the revenues obtained from Koshi valley SG&S taxes are shared with 2 VDCs and with 2 other VDCs in the case of taxes levied in the Melamchi valley.

Revenue sharing is a common practice in all districts. Although the tax collection practice is uniform with the DDC collecting the taxes, the collected taxes are shared with the DFO, Buffer zone Committees and the VDCs. To understand the general revenue sharing practices with VDCs, a detailed account of sharing mechanism was studied in Makwanpur district. The data compiled for FY 2066/67 are presented in Table 4.6.

Table 4.6 shows that Makwanpur DDC collected a total revenue from tax farming in 2066/67 worth Rs. 28 million. Of this, the DDC distributed a minimum amount of revenue of Rs.100,000 to all VDCs as equal minimum sharing. For those VDCs who contributed in revenue generation, they were entitled to receive more, besides the above mentioned minimum sum. For this, the district devised criteria to construct a revenue sharing formula. The criteria included five variables with percentage weight attached to each variable as follows:

First, a broad aggregate distribution sum was fixed from the total revenue. The LSGR recommended sharing 35 to 50 percent of the total revenue with the VDCs. The district set aside 35 percent of the Rs. 28 million revenue and distributed the sum according to the five weighted criteria variables. All VDCs having claims to the revenue share based on the above criteria were given scores on the five criteria variables. For

Table 4.6: Makwanpur DDC collected a total revenue from tax farming in 2066/67

S. No.	Variable criteria	Weight
1	Past collection rate (Av.)	30
2	Number of crusher industries within the VDC jurisdiction	15
3	River area used from the VDC	20
4	Responsibility assumed on sub-sector activity observation (monitoring)	20
5	Previous sharing rate	15
	Total	100

example, Hetauda Municipality received the score of 12 on the first criteria which means that it received 12 percent of the total revenue set aside for sharing under criteria 1. Since criteria 1 has 30 percent weight, the share of Hetauda municipality under criteria 1 is 3.6 percent of the total revenue set aside for sharing. The VDCs' shares were then determined by the weight scores received by each VDC. So each VDC received the minimum common share and additional share based on the set criteria. In total, the DDC distributed about 52.8 percent revenue to the VDCs out of tax contract revenue and retained another 47.2 percent for itself. The revenue share distribution amount based on the above formulae is presented in Table 4.6.

One important issue in revenue sharing is that it is not shared with the central government. The national highways whose construction and maintenance are funded by the central government are used by the SG&S industries to transport the products, and are seriously affected from such trans-

Table 4.7: DDC Revenue sharing mechanism in Makwanpur district, 2066/67

Total weight	N0. of VDCs	613,200	30 Past collection rate	15 No. of crushers	20 River area for extraction	20 Office observations	15 Past sharing rate	100 Base minimum
Conservation	3	1,044,820				22		22
Hetauda Municipality		193,960	12	0	9	13	6	40
Sisneri		251,320	0	0	3	0	2	5
Markhu		915,140	0	0	0	0	2	2
Bhainse		131,320	7	16	5	0	9	37
Palung		131,320	0	0	0	0	2	2
Daman		150,660	0	0	0	0	2	2
Tistung		172,120					1	1
Agra		2,020,960				2	2	4
Basamadi		658,540	18	27	21	11	17	94
Handikhola		622,760	8	0	6	5	5	24
Padampokhari		1,937,440	7	0	5	6	5	23
Manahari		444,200	18	30	20	8	14	90
Raksirang		267,040	5		2	4	4	15
Makwanpurgadhi		872,560				5	4	9
Ambhanjyang		2,031,400	5	12	7	9	6	39
Churiamai		220,000	20	15	22	15	19	91
Hatiya		2,100,000						0
Other VDCs	21	14,778,760	100	100	100	100	100	500
DDC earning		28,000,000						
% shared		52.8						

Source: DDC Makwanpur

port. Therefore, to compensate for the damage done to infrastructures funded and maintained by the central government, the model for sharing revenue from SG&S resources may need to include the central government also in the future.

The average revenue shared per VDC thus works out to Rs. 343,692 in FY 2009/10. A LGCDP report on the revenue and expenditure of the VDCs showed that the average revenue from grant and internal sources in Makwanpur district was Rs. 1,313,000 in 2006/07 (See Annex 4). From this figure, it can be derived that the share of SG&S in the average total revenue of the VDCs is 26.2 percent in FY 2006/07. So, revenue from SG&S is also significant in the total VDC revenue portfolio.

Management and compensation issues

As indicated earlier, DDC taxes on SG&S apply to what is transported out of the district's tax posts – these taxes are not levied on extraction *per se*.

That taxes are only levied on the transport of SG&S, rather than on extraction itself, implies that they are not used as an instrument for regulating the quantity of SG&S that is extracted, the ways in which extraction takes place, or where it takes place. Indeed, there is little evidence that DDCs are particularly concerned about such issues. Revenues from SG&S taxes, as currently administered, simply increase or decrease as a function of supply – which one can safely assume to be largely a reflection of prevailing demand. Although there are very few rules governing SG&S extraction – the main (and perhaps the only) one relates to a proscription on extraction within 500 metres of any bridge – it is clear that even if such rules were to be more comprehensive, the system of taxation would do little, if anything, to enhance their enforcement.

Tax farming and revenue administration issues

Some of the more perplexing issues about SG&S taxes and revenues are related to the way in which they are administered through tax farming arrangements.

Some distinct advantages

However much it might seem – *a priori* – that tax farming is apparently an “old-fashioned” way of collecting tax revenues, the system seems to have some very obvious advantages. Perhaps most importantly, tax farming may be more efficient than using public officials to collect taxes³. By out-sourcing the collection of SG&S taxes to private sector contractors, DDCs are effectively reducing their own transaction and financial costs – DDCs do not need to hire full-time staff to collect the taxes and thus avoid all the direct costs like payroll, operational costs for tax collection posts, and indirect costs of supervision, payroll administration, pensions, etc., associated with additional staffing. Instead of hiring and supervising additional staff for tax collection points, DDCs limit their costs to the procurement and supervision of a single private sector contractor⁴. This may be particularly advantageous in a context where revenues are seasonal in nature, as SG&S taxes appear to be, so that there are periods of little fiscal activity. DDC officials themselves cite the avoidance of transaction and direct financial costs as being one of the main reasons for out-sourcing the collection of taxes on SG&S. And there is anecdotal evidence to the effect that tax farming arrangements tend to generate more revenues than does *amanat* – although this may be a result of low revenue potential discouraging private contractors from taking on tax farming contracts in DDCs where the *amanat* system has to be practiced.

Another important argument in favour of tax farming arrangements for the collection of SG&S taxes is that DDCs effectively pass on a number of risks to private contractors. Where revenues are potentially volatile or unstable, tax farmers have to bear all risks while the DDC continues to mobilise revenues through regular contractor payments. In Sindupalchowk, for example, DDC officials note that it is the Koshi and Melamchi SG&S tax farmers – and not the DDC – who suffer the consequences of strikes (*bandhas*), political instability, and in the past, an armed conflict. Occasionally, however, contractors have formally

3 Historically, tax farming has been associated with pre-colonial states, with a limited capacity to manage large and complex revenue collection bureaucracies (see Levi 1988).

4 See Fjeldstad et al. (2009) and Iversen et al. (2006) for discussions of the same kinds of advantages to tax farming arrangements in local government revenue systems in, respectively, Tanzania and Uganda.

applied for some compensation, like relaxation in contract amount payments, because of the excessive “bandhas”. Apparently, DDCs all over Nepal allowed such relaxation on payment only for 19 days during the Popular Movement of 2006 when the monarchy was ousted.

Another advantage of tax farming is that it provides DDCs with a predictable and regular source of income⁵. The contracts between tax farmers and DDCs make provision for regular and fixed payments by the former. This can be a distinct advantage for DDCs, especially because other sources of revenue, e.g., GoN grants – which are often disbursed behind schedule – and other taxes, especially those that are shared, may be highly unpredictable or irregular. Predictability and regularity signify a robust budgeting process. This advantage is explicitly recognized by DDC officials. The regularity and predictability of revenues from tax farming contracts gain added importance because they are highly discretionary, and can thus be used to finance a wide range of DDC expenditures.

These real and recognised advantages to tax farming arrangements in Nepal should not be under-estimated

But not without some serious concerns and problems

There are two principal concerns in terms of the effectiveness and efficiency of using out-sourcing arrangements for the collection of SG&S taxes:

- ◆ Are private sector tax collection contractors being over-zealous in their quest for revenues, and taxing more than they should ? If yes, does it matter ?
- ◆ Are the contracts between DDCs and private sector farmers too generous towards the latter, thus amounting to a significant forgoing of revenue by the former ?

Over-zealous tax farmers have historically been the Achilles’ heel of such arrangements, and one of the main arguments cited against tax farming systems⁶. Tax farmers have immediate short-

term incentives to over-tax – by illegally increasing the rate of taxation on SG&S, by extracting taxes from more people than should be the case, or by taxing SG&S transporters more often than is legal. The more they collect, the greater their profits. The DDCs, on the other hand, may have a greater incentive to ensure that tax collection does not drive out business or create political dissatisfaction.

In the case of SG&S taxes, however, there seems to be little empirical evidence that tax farmers are being over-zealous. Other than by levying higher-than-legal tax rates, or by establishing more tax-collection points than stipulated by their contracts, it is difficult to see exactly how private sector collectors of SG&S taxes could be over-zealous. How could a tax collection point levy taxes on more transporters than there are? In addition, levying higher rates of tax on SG&S also seems unlikely as receipts are issued and transporters appear to know the prescribed volumetric rates. It also seems unlikely that one or two staff at a tax collection point would be over-zealous since they have no obvious means of coercion and would likely face threats from transporters if they tried to over-tax.

If a SG&S tax farmer in a given district were to become over-zealous, transporters, who are, by definition, highly mobile, could simply “exit” and move to another district to obtain SG&S – and there definitely are plenty of options in this respect.

In the case of SG&S taxation in Nepal, the issue of “under-pricing” is probably far more of a concern than “over-taxing”. When DDCs tender out their SG&S tax farming packages, are they setting contracts to reflect the correct value of the SG&S resources, or are they under-estimating the value of these packages? If contract values are being systematically under-estimated, this would imply that private sector bidders are potentially getting their hands on very lucrative contracts, for which they will pay the DDC much less than the real value. This is best illustrated by way of a concrete example, described in the text box below.

⁵ Indeed, the predictability/regularity of revenues from tax farming arrangements was one of the main reasons why the system of *fermiers-généraux* survived and flourished for so long in 18th century France (see White n.d.)

⁶ See Levi (1988)

There are two potential reasons why DDC estimates may not be very realistic and thus under-price the value of eventual tax farming contracts:

1. The DDC may not have the information necessary to calculate accurately levels/values of SG&S extraction in local river valleys. This would not be in any way surprising. If this is true, it is a question of the capability of DDCs to accurately assess their SG&S tax bases⁷. However, after the mandatory IEE/EIA, the safe extraction volume can be known if the study is done seriously. Another obvious question then is: Has the contracting practice affected the seriousness of IEE/EIA study, so that the studies lend to under-pricing, especially if the IEE is done by the DDC technical staff themselves?
2. DDC officials may be deliberately allowing under-priced contracts to be awarded as a way of extracting larger bribes from successful bidders. The greater the under-pricing, the larger the profit margin, and, the greater the amount that a successful bidder would readily part with as a bribe for contract award.

Under-pricing, either because of a lack of knowledge on the part of DDC officials, or because of rent-seeking and collusions between the contractor and DDC officials, SG&S tax farming arrangements can result in less than optimal revenues for the DDC.

Procuring tax farmers

There are a number of issues related to how DDCs procure private sector SG&S tax collectors. The use of tax farming arrangements may be seen as a way of shifting rent-seeking opportunities like kickbacks, bribes, etc., away from the front-line of civic servants to those higher-up. In the event that DDCs were themselves to collect taxes on SG&S, most rent-seeking opportunities would exist at the point at which taxes are collected, i.e., at collection points on the roads. By opting for a tax farming option through which tax collection contractors are selected by DDC officials in district headquarters, those rent-seeking opportunities are moved towards senior DDC officials, who can then exercise influence through the procurement process.

According to DDC officials, the procurement process for SG&S tax farmers follows regular

Box 3: SG&S tax farming packages in Sindupalchok district

As mentioned in text box 2, in 2010-11, two SG&S tax farming packages were tendered out in Sindupalchok District: one for the Koshi valley, the other for the Melamchi valley. For the Koshi package, the minimum “floor” was calculated by the DDC to be NRs 3 million, and for the Melamchi package, the “floor” was set at NRs 5.5 million. The private sector contractor who was eventually awarded both contracts submitted bids of NRs 4 million and NRs 7.8 million respectively. These were the highest bids submitted and were the values incorporated into the contract drawn up between the tax farmer and the DDC.

Assuming that he is rational, the tax farmer is betting that he can pay Sindupalchok DDC a total of NRs 11.8 million and 13 percent VAT, cover his operational costs, and make some kind of profit. In other words, the tax farmer in Sindupalchowk is assuming that he can collect SG&S taxes of a value of at least NRs 13.4 million (including VAT), plus any operational costs, to break even. But how much more can he make in profit?

If the DDC’s estimate of what can be collected is a serious under-estimation, then the contractor is likely to make a significant profit – effectively the revenue Sindupalchok DDC forgoes by not collecting SG&S taxes itself. The crucial question is: How does Sindupalchok DDC estimate what is the potential value of the SG&S tax farming contract?

DDC officials in Sindupalchok candidly estimate that the tax farmer should, all things being equal and after deducting all operating expenses and all payments to the DDC, make a profit of NRs 1.5 million from the Melamchi package alone. Is that an accurate estimate? It is not possible to know with any degree of certainty. Such estimates would not be based on any real knowledge of extraction/transport levels and the contractor is unlikely to provide accurate information.

7 This, however, should change when new procedures for IEEs are introduced as a consequence of the Constituent Assembly's reforms of the SG&S sub-sector.

GoN procedures following recent Public Procurement Act (PPA 2006, which includes the development and use of e-procurement option), and is thus as transparent as is legally required. Tax collection packages are publicly advertised. It is impossible to know how far bidders collude – and equally impossible to know whether there is any corruption in the process by which bids are evaluated and contracts awarded.

Is it a conflict of interest to allow a tax farmer to also be a SG&S transporter or construction contractor? A person or company would be loathe to tax herself or itself. Viewed in terms of DDC revenues, this makes no difference at all: if a tax farmer, who is also a SG&S transporter, does not tax herself, that in no way changes the financial obligation of the tax farmer towards the DDC. The tax farmer must still pay the same amount of money to the DDC. DDC revenues do not change.

On tax farming in general

On balance, the preferred option of tax farming as a way of collecting taxes from SG&S extraction and transport is probably the most attractive for DDCs – subject to improvements in assessments of revenue potential and in the procurement process. *Amanat*, the alternative, is probably more costly, less efficient, and more onerous for DDCs.

1.5 Local categorization of SG&S products

SG&S products have been categorized based on conventional wisdom without any strict scientific rigour. For example, sand is categorized into red sand and white sand. Red sand generally comes from quarry sources while white sand comes from river beds. Red sand is considered inferior to white sand, and is priced at 20 percent lower than white sand. Within these categories, there are further sub-categories such as: coarse sand and fine sand. Coarse sand is considered superior to fine sand for the purpose of construction, and therefore commands a higher price. Red sand has high clay content and needs

double washing to make it comparable to white sand.

In the case of gravel, there are two categories: crushed gravel and sorted gravel. Crushed gravel is produced by crushing large stones, while sorted gravel is separated from the river debris. Both of these have some favorable and unfavorable characteristics making quality comparison difficult. For example, sorted gravel has a fine surface with a weak grip as opposed to crushed gravel which has a rough surface with good grip. On the other hand, crushed gravel is weakened by the tremors endured during crushing, unlike sorted gravel which remains strong. Crushed gravel is slightly more expensive due to the high cost of crushing. Within these categories, there are further distinctions based on the different sizes that are produced using different sized filter nets.

In stone, there are two categories: small and large stones. Both very small and large stones command a lower value, and manageable medium sized stones command a higher value.

4.5 Consumer Price Trends of SG&S Products

In each district, the study team inquired about the consumer prices of SG&S products as they were 5 years ago and as they are now. The compilation of price data revealed that the prices of SG&S products have risen at an annual rate of 17 to 35 percent (Table 4.8), a rate much higher than the annual inflation rate of about 11 percent. The highest rise is in the case of sand and the lowest is for gravel. Gravel prices have increased at a lower rate due to reduced production costs in crusher industries.

However, the advantages of these price surges have not been reaped by the river/road side manual crushers. Instead, it is the transporters who have profited the most by buying the crushed gravel at around Rs. 200 per cubic metre,

much less than what the end-consumers pay for it. In Kailali district, for example, manual crushers previously sold one tractor-load of crushed gravel at around Rs. 800. But now, under distress, they are compelled to sell the same quantity at less than Rs. 400. In Dhading, the price paid by transporters for manually crushed gravel rose by Rs. 2 per cubic metre over the last five years – an increase of 20 percent – as opposed to nearly a 100 percent rise in rice prices.

4.6 Variations Across Districts in process and Practices

This report highlights the fact that, even within a single industry operating under a common national policy and legal arrangements, there is a high level of diversity as determined by differing contexts. The following table shows these diversities in practices and processes (Table 4.9)

Table 4.8: Consumer price trends of SG&S products 5 years ago and now

Particulars	Kailali	Rupandehi	Dhading	Makwanpur	Sunsari
Price 5 years ago (Rs/m³)					
Sand	300	350	350	350	350
Gravel	500	650	600	650	600
Stone	233	250	250	175	200
Price now (Rs/m³)					
Sand	1,333	1,500	1,450	1,500	1,325
Gravel	1,333	1,500	1,450	1,500	1,325
Stone	667	675	675	710	650
Annual price increase					
Sand	34.8	33.8	32.9	33.8	30.5
Gravel	21.7	18.2	19.3	18.2	17.2
Stone	23.4	22.0	22.0	32.3	26.6

Table 4.9: Variation across districts

Variables	Sunsari	Makwanpur	Dhading	Rupandehi	Kailali	Sindhupalchok
Mode of revenue collection		<i>Amanat</i>	Bid contract	<i>Amanat</i>		Bid contract
Tax rates (Rs./cubic feet)			2			1.7
Sand				1.5		
Gravel				2		
Stone						
Level of extraction	Low	High	High	High	Low	High
Resource value	0	1.73	0	0	0	0
Use of heavy equipment in river	Prohibited	Allowed	Allowed	Prohibited		Allowed
Riverbed situation	raised	Mixed	Lowered	Lowered	Raised	Lowered
Road damage	Low	Moderate	Very high	Low	Moderate	High
Threats to bridges	High	High	Moderate	Low	Moderate	Moderate
Loss of human lives	No	Yes	No	No	Yes	No
Collection potential	High	High	Low	Low	Very high	Moderate
Annual deposition depth	1				0.61	
Daily earnings of manual crushers	100	125	60	250	65	300
Export market share	90	90	0	95	95	0
Revenue ploughed back to river	Yes	Yes	Nominal	Yes	No	No

5

ENVIRONMENTAL MANAGEMENT AND OUTCOMES

This section deals with the environmental practices and consequences influenced by stakeholder activities in the SG&S sub-sector.

5.1 Environmental Pros and Cons of Extraction and non-extraction

The study found that both extraction and non-extraction can have positive as well as negative effects. For example, when there was none or little debris extraction in the Tinau river of Rupandehi district, the riverbed was raised due to large deposits of SG&S. In the monsoon of 2003, devastating floods occurred in Butwal city and caused huge damage. A settlement called Daure Tole was totally swept away by that flood. Now that the river has deepened due to extraction, such floods do not inundate Butwal city, even during the monsoon. There was another major flood in 2009 in the Tinau river valley, even higher and more intense than that of 2003. Yet, no flood water entered the city. Because of the extraction of SG&S the river bed has now been lowered, reducing the impact of floods on lives and property.

The problems of non-extraction are also seen at the Manahari and Lothar bridges in Makwanpur district. Deposition of river debris is about to clog the bridges.

On the other hand, due to over extraction near the bridge on the Seuti river of Sunsari district, the bridge on the Koshi highway is on the brink of collapse, and another bridge with stronger foundations is being built.

Along the Melamchi river in Sindhupalchok district, the advantages and disadvantages of river deepening can be seen simultaneously. One irrigation system has dried up as the water level at the intake was lowered, whereas another 50 hectares of farmland, which used to be flooded every year, is no longer inundated at all. Hence, the problem of extraction and non-extraction are contextual and must be accordingly treated for policy purposes.

5.2 Extraction and Sales Practices

Current extraction and sales practices must be assessed in the light of the country's prevailing Acts and laws, some of which are discussed in the earlier sections of this report.

Better Practices

Better practices are those that extract and utilize SG&S using environmentally sound methods. Observations in the field and a review of related works show the following to be sound and acceptable practices:

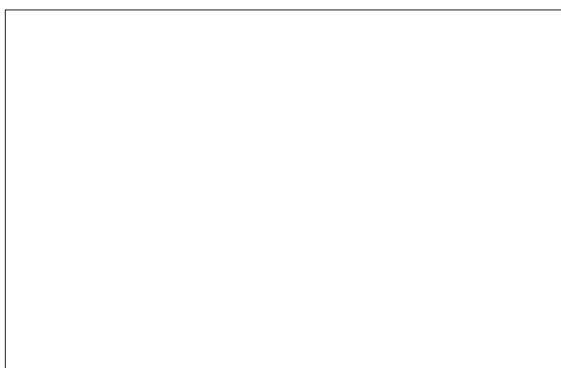
- ◆ The prohibition on the use of heavy equipment directly on the riverbed. Such extraction used to be practised before, but has now been controlled in several areas. For example, it is now fully and effectively controlled in Rupandehi district (Tinau river), partially controlled in Kailali and Sunsari districts, but continues to be used indiscriminately in Makwanpur and Sindhupalchowk districts. The prohibition allows the surrounding poor communities to work in the riverside.
- ◆ Previously, SG&S products were transported in open trippers, trucks and tractors, causing dust pollution in road side settlements. The new arrangement in all districts is to cover the material during transport. This arrangement is working effectively except in the case of a few vehicles.
- ◆ Previously, many vehicles transported wet sand, dripping excess water onto the roads. This practice is reportedly extremely damaging for the roads. Now it is fully under control in all districts. The study team could not locate any sand transporting vehicles dripping sand water on the road.
- ◆ The initial crusher industries operated without any safety and precautionary measures against sound and dust pollution. But now around 80 percent of the crusher industries visited during the study were equipped with precautionary measure like running water jets and zinc sheet covers for the noisier components.

Unacceptable Practices

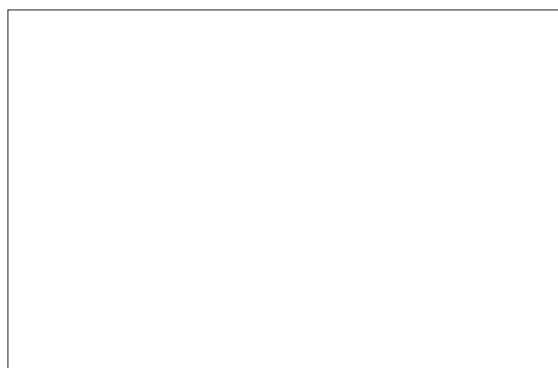
Unacceptable practices cause harm to the environment as well as to the followers of better prac-

tices. These include, among others, the following:

- Letting manual crushers and other unskilled workers work without safety arrangements such as the use of masks, hand gloves, helmets and boots. Unskilled workers in the crusher industries have been provided partial safety measures. Manual crushers interviewed reported that almost all of them had one or the other kind of, or even multiple ailments such as backache, pains in legs, stuffed noses due to dust, and shattered hands for a pittance in earning.
- ◆ “Mafia” practices in the sub-sector such as forceful and illegal capture of tax farming contracts, non-payment of due contract amounts to DDCs, imposition of mandatory donations linked to security threats upon crusher industries and contractors, not paying legal taxes during transportation, etc.
- ◆ Deep digging practices using heavy equipment in the riverbeds and terraces are unacceptable. The diversion of river courses for raw material collection, which still continues in some districts like Sindupalchowk and Makawanpur, is also unacceptable. In Makawanpur district, a child drowned in the deep burrow pit dug by extractors.
- ◆ Transporting of wet sand dripping water has caused road damages and transporting SG&S products in open trucks has caused dust pollution.
- ◆ The displacement of large numbers of landless and poor manual crushers by highly mechanized crusher industries on the road sides has increased the effects of poverty.
- ◆ In almost all districts, the prohibition of extraction within 500 metres up-stream and



Zinc sheet covered crusher industries



Bridge warning

down-stream of bridges has been neglected, compromising infrastructure like bridges. This practice is more serious in Sunsari and Makawanpur districts and less so in Rupandehi district.

- ◆ The piling-up of SG&S products on the road-side reaching the shoulder level has not been controlled. The study team learned that a motorcyclist met with an accident and died due to this practice in Kailali district.
- ◆ Removal of large stones from the rivers has been found to erode the river bank causing loss of forest and farm lands. This problem is more serious in Sunsari district.
- ◆ Practices of the media which exaggerate the negative outcomes, often with partisan interests including rent seeking, and often done with strong nationalistic fervour. This sends the wrong messages to national policy makers.

1.3 Crude Estimates of Annualized Environmental Losses in the Study Districts

The estimation of the environmental losses in the study districts was not easy. Nonetheless, enquiries about such losses were made during field level interviews and also during the district level workshops. The estimates along with the assumptions underlying them, however crude these may be, are presented in Table 5.1 to estimate environmental losses as a percentage of the revenues derived from SG&S products. The analysis shows that the environmental losses varied from a minimum of less than 2 percent of the revenue from SG&S in Rupandehi, to a maximum of 70 percent in Dhading district, with an average of about 18 percent. The estimates show that environmental losses in each district are below the revenue generated by tax farming.

Table 5.1: Crude estimates of environmental losses in the study districts

Environmental loss heads	Unit	Kailali	Rupandehi	Makwanpur	Dhading	Sunsari
Roads damaged						
Total	km					
Partial	km	20	10	25	35	20
Valuation rate	Rs./km	250,000	125,000	300,000	450,000	200,000
Value		5,000,000	1,250,000	7,500,000	1,5750,000	4,000,000
Forest damaged	Ha	20	5	15	15	30
Valuation rate	Rs./Ha	50,000	50,000	70,000	60,000	40,000
Value		1,000,000	250,000	1,050,000	900,000	1,200,000
Agricultural land lost	Ha	5	1	20	5	15
Valuation rate		50,000	120,000	100,000	125,000	75,000
Value		250,000	120,000	2,000,000	625,000	1,125,000
Agricultural land damaged		20	5	60	15	40
Valuation rate	Rs./Ha	25,000	45,000	40,000	65,000	30,000
Value		500,000	225,000	2,400,000	975,000	1,200,000
Value of loss of aquatic habitat		50,000	100,000	250,000	500,000	50,000
Human deaths and disability		1		1		
Valuation rate		260,000	1,425,000	500,000	386,400	325,000
Value		260,000	0	500,000	0	0
Others (value 5% of total)		353,000	97,250	685,000	937,500	378,750
Total		7,413,000	2,042,250	14,385,000	19,687,500	7,953,750
DDC Revenue (2009/10)		462,316,550	736,530,070	127,520,000	474,278,104	863,224,415
Tax from SG&S		40,000,000	149,080,824	28,125,356	28,125,356	22,000,000
Loss as % of DDC revenue		1.6	0.3	11.3	4.2	0.9
Loss as % of DDC revenue from SG&S		18.5	1.4	51.1	70.0	36.2

Source: District and stakeholder level estimates. 2009/10.

These may now be negative for terai districts during the last export ban period of nearly a year when local body revenues had dropped sharply due to reduced SG&S transactions and the forced application of the *amanat* model in revenue collection.

1.4 District IEE/EIA Reports

SG&S sub-sector actors are often unscrupulously and blatantly blamed for causing massive damage to local and national natural environments. This prompted the CA Natural Resources Committee to issue an order requiring all DDCs to prepare EIA/IEE reports on the rivers and streams being used for SG&S extraction, before proceeding towards tax farming contracts, sales and export. The CA Committee order, however, was not a new development. It was already provided for in the LSGA and LSGR. Clause 210 of the LSGR requires the DDCs to prepare Environmental Impact Assessment (EIA) reports for rivers if the average daily extraction of SG&S raw materials exceeds 300 cubic metres; or an Initial Environmental Examination (IEE) report if the annual extraction level was below that level. Average daily levels of SG&S extraction in three out of the five districts selected for the study were below 300 cubic metres, and hence they prepared the IEE reports. Rupandehi's extraction level crossed this benchmark and hence it had to prepare a more detailed report on environmental issues and was still under preparation. Makwanpur district has prepared its EIA report.

As stated earlier, the CA Natural Resource Committee has instructed the local bodies not to proceed with the extraction, sales and export of SG&S products without preparing IEE/EIA reports. To comply with this, four of the sample districts, except Rupandehi, have completed their IEE/EIA reports in line with the legal guidelines provided by different Acts and regulations. These include the Environmental Protection Act, 1997; Environment Protection Rules, 1997; Interim Constitution, 2007; LSGA 1999; LSGR 2000; EIA Guidelines, 1993; Environment Management Plan, 1997; Water Resources Act 1992 and Water Resources Rules, 1993.

The IEE studies of the rivers were contracted out to local consultants in some districts. In Kailali, for example, the work was carried out by Ghodaghodi Consultants. The IEE studies in other districts were prepared by the DDCs' own technical teams. The major outputs of these IEE reports are: the identification of environmentally safe exploitation zones; exact locations of recommended extraction sites; and, estimates of annual debris deposit amounts and recommended safe exploitation quantities. The IEE/EIA reports include environmental management plans of the respective districts for a period of 1-3 years. The summary findings of these reports are presented in table 5.2.

The data from the IEE/EIA reports reveal one important fact – that safe extraction levels can be much higher than the current extraction levels. For example, in Kailali district, the current extraction level is 94,500 cubic metres per year and the IEE recommended environmentally safe extraction level is 109,000 cubic metres, which is nearly 16 percent more than the current level of extraction. This means that less SG&S is being extracted than what could be extracted, but SG&S resources were not being extracted in appropriate ways, so that current extraction levels appeared too high to the media.

The district IEE/EIA reports have identified positive and negative impacts of the existing system but their quantitative assessments have not been made, which made it difficult to make an approximate assessment of net environmental outcomes from the district SG&S activities. This study makes some crude assessments of the quantitative/monetary outcomes of the environmental losses that can be attributed to the SG&S sub-sector in each district. .

Some impacts identified by the study team, along with suggested mitigation measures are summarized below:

Positive impacts of extraction activities

- ♦ Increased movement of people and development of small but permanent and long term market centres;
- ♦ Additional income for local people;

Table 5.2: Summary of District IEE Reports

District	River(s)	Zone of management	Collection areas	Area of extraction (sq.m)	Av. Depth of sediment deposition (m)	Annual deposition	Excavation amount (cum/day)	Permissible DDC extraction (m ³)
Kailai	Khutiya	Godavari, Shreepur, Beladevipur		629,408	0.61		300	109,000
Rupandehi Makwanpur*	Tinau Rapti and its tributaries	NA Churiamai, Basamadi, Ambhanjyang, Bhainse, Hetauda municipality, Palung and Sisneri				15,115,015		59,244,934
Dhading	Samari Trishuli	Benighat, Goganepani, Baireni	Richoktar, Koliyabagar, Mastar highway			271,140	300	108,456
Sunsari	Seuti, Sardu, Budhikhola, Baghkhola, Patnali	Barsajhora, Koshi Triveni Naka, Kholsinaka, Itahari bridge in Budhikhola				1,599,004	200	110,000

Source: Compiled from District IEE/EIA Reports

- ◆ Employment opportunities for skilled, semi-skilled and unskilled workers;
- ◆ Technical skill enhancement for local people;
- ◆ Influx of modern infrastructure; and,
- ◆ Increased local body (DDC/VDC/Municipality) revenue for local development works.

Negative impacts

Physical aspect

- ◆ Embankment instability;
- ◆ Incidence of bank cutting;
- ◆ Changes in river morphology;
- ◆ Disruption of gravel roads; and,
- ◆ Degradation of water quality, such as increased turbidity of water that has a negative effect on the habitat of aquatic life, etc.

Biological aspect

- ◆ No direct impact on vegetation and forest, except in Sunsari district;

- ◆ Illegal collection of fuel wood by workers;
- ◆ Loss of aquatic life habitat;
- ◆ Disturbance to wildlife during transportation and crusher operation, especially in Kailali and Makwanpur;
- ◆ Retardation of vegetation growth due to dust deposition on leaves;
- ◆ Increased movement of people to the detriment of local wild life;
- ◆ Increased poaching activities; and,
- ◆ Increase in incidents of attack by wildlife.

Mitigation Measures

- ◆ River training works;
- ◆ River bank plantation, particularly during critical spells;
- ◆ Drain management around bridges;
- ◆ Extraction control within 500 metres of bridges;
- ◆ Extraction and transportation only during day time (7 am to 6 pm);

- ◆ one door tax collection from DDC and sharing, so that polycentric collection of tax by clubs, individuals and institutions is stopped;
- ◆ Local people and households to be given priority in employment and access to SG&S activities;
- ◆ Safety gear such as masks, helmets, gloves and boots to be provided to the workers;
- ◆ Health services to be provided to the workers;
- ◆ Different related organizations and local community groups to be brought under a common umbrella for environment management and monitoring; and,
- ◆ Excavators, transportation and crushers sites to be situated at least one kilometer away from forest boundaries.

6

SG&S SUB-SECTOR ECONOMICS

6.1 Local Bodies

Local bodies are among the main beneficiaries of the SG&S sub-sector, raising significant revenues from the taxation of SG&S products, both in domestic sales and exports. In 2009/10, Rupandehi district raised the most revenue – over Rs. 150 million. Kailai was the lowest revenue earner, with an annual maximum of Rs. 5 million. This revenue is shared with the VDCs, DFO, Buffer Zone Management Committee and community forest user groups through a sharing formula, which is discussed later. Generally, DDCs retained 50 percent of the revenue, shared 35 percent with VDCs, and shared another 15 percent with the DFOs and CFs.

In order to demonstrate the importance of SG&S revenues, a detailed 4 year income portfolio of Sunsari district was compiled and analysed. The detailed data is presented in Annex 1, and the summary results are presented in Table 6.1. According to the summary table, the income from SG&S ranged from 32.5 percent to 40.5 percent of the total resource use tax in the whole district; 87 to 99.9 percent of total permit fees collected by the district; 92.6 to 98.1 percent of the total receipt from sales of resources; 17.1 percent to 36.1 percent of the total internal revenue; and 3.6 percent to 7.7 percent of total DDC income, including grants from the central government. The annual change in revenue shares of SG&S is also increasing in all categories except as a percentage of the of total income.

Table 6.1: Share of sand, gravel and stone (SG&S) in the DDC Income in Sunsari

Sand, Gravel and Stone (SG&S)	2006/07 (Actual)	2007/08 (Actual)	2008/09 (estimate)	2009/10 (estimate)	Slope (2006/07 to 2009/10)
% of resource use tax	32.5	34.8	38.5	40.5	2.8
% share of permit fee	97.7	87.0	93.4	99.9	1.3
% share of total sales	92.6	94.5	96.4	98.1	1.8
% of internal revenue	17.1	21.4	26.6	36.1	6.2
% of total income	5.1	7.7	6.7	3.6	-0.5

The share of SG&S in the total revenues of other districts was also assessed from the DDC revenue data. These ranged from 1.1 percent in Kailali district to as much as 75.8 percent in Dhading district. (Table 6.2)

Table 6.2: Share of SG&S revenue in total DDC revenue

Districts	2064/65	2065/66	2066/67	Annual growth rate (%)
Kailali		1.1	8.7	7.6
Rupandehi		16.7	20.2	3.5
Makwanpur	11.7	32.2	22.0	5.1
Dhading	75.8	9.0		-66.8

Similarly, the expenditure on river works and environmental management was estimated for the study districts and an assessment of the percent of total DDC expenditure on river works and environmental management was calculated. The calculations showed that Kailali district spent nothing on environmental management while Sunsari district spent up to 15 percent of total expenditure on river works (Table 6.3). In any case, the plough back investment level remains much below the recommended level of 30 percent.

Table 6.3: Share of investment allocation for environment management in the total expenditure of the districts

Districts	2065/66	2066/67
Kailali	0.0	0.0
Rupandehi	0.3	2.6
Makwanpur		1.1
Dhading		0.3
Sunsari		14.9

6.2 DDC Income and Expenditure Trends – Total and SG&S Related

It has been indicated earlier that the revenue from SG&S through tax farming and export permits is a large portion of the total DDC revenue in about one third of all districts. This will also be evident from the revenue analysis of the four study districts, namely Makwanpur, Rupandehi, Dhading and Sunsari. The analyses are presented in Tables 2 to 5.

6.3 River and Roadside Manual Crushers

Up until recently, thousands of poor Nepalis, mostly landless families with very limited economic prospects, were doing backbreaking work in the SG&S sub-sector for extremely small earnings. They set up makeshift thatched shacks or polythene tents along the riverbanks or along the highway. Doing this kind of is still a compulsion born out of poverty. Such people continue to be among the most marginalized workers in Nepal.

With the advent of mechanized crusher industries, almost 60 percent of manual crushers have been fully displaced. Another 30 percent have found jobs or contracts with the crusher industries. Only 10 percent continue to cling to the old profession. The current study has found that their real income has been deteriorating even further because they have to compete with the modern crusher industries. When asked why the manual crushers are involved in this work, they say – “Unemployment and landlessness caused us to take up the mining job. And, the work did not demand special skills.”

Loss of human lives in the pursuit of any enterprise is considered an environmental loss. But

Table 6.4: Income and expenditure trends for Makwanpur DDC

Income and expenditure	2064/65	2065/66	2066/67	Trend rate (slope)
Total income (Rs.)	72622078	113226016	127520000	27448511
Income from SG&S (Rs.)	852444	36500000	28000000	9737678
Export Tax from SG&S (Rs.)	300000	450000	10000000	4850000
Total income from SG&S	8824644	36950000	28125356	9650356
Income from SG&S as % of total income	11.7	32.2	22.0	5.1
Total expenditure (Rs.)	194456068	300142000	449859000	127701466
Expenditure on river protection works and environment management	0	0	2000000	
% expenditure on river protection works and environment management			0.4	

Table 6.5: Income and expenditure trends for Rupandehi DDC

Income and expenditure	2065/66	2066/67	Trend rate (slope)
Total income (Rs.)	919810060	736530070	-183279990
Income from SG&S (Rs.)			
Export Tax from SG&S (Rs.)			
Total income from SG&S	153842692	149080824	-4761868
Income from SG&S as % of total income	16.7	20.2	3.5
Total expenditure (Rs.)	861895440	166699410	-4761868
Expenditure on river protection works and environment management	2708870	4300000	1591130
% expenditure on river protection works and environment management	0.3	2.6	2.3

Table 6.6: Income and expenditure trends for Dhading DDC

Income and expenditure	2064/65	2065/66	Trend rate (slope)
Total income (Rs.)	68613400	474278104	405664504
Income from SG&S (Rs.)	52000000	42610000	-9390000
Export Tax from SG&S (Rs.)	300000	450000	150000
Total income from SG&S	52300000	43060000	-9240000
Income from SG&S as % of total income	75.8	9.0	-66.8
Total expenditure (Rs.)		136960164	
Expenditure on river protection works and environment management		400000	
% expenditure on river protection works and environment management		0.3	

Table 6.7: Income and expenditure trends for Sunsari DDC

Income and expenditure	2065/66	2066/67	Trend rate (slope)
Total income (Rs.)	382725693	863224415	480498722
Income from SG&S (Rs.)	181000000	220000000	39000000
Export Tax from SG&S (Rs.)	0	0	0
Total income from SG&S	181000000	220000000	39000000
Income from SG&S as % of total income	4.7	2.5	0.8
Total expenditure (Rs.)	13646500	13450000	
Expenditure on river protection works and environment management		2000000	
% expenditure on river protection works and environment management		14.9	

in Nepal, human lives lost are not valued in any enterprise economic analysis. This is a serious error of omission. The developed countries always take loss of human lives into account. For example, In United States during the 1980s, a value of US\$150,000 was taken as the value of one human life lost. The methodology of human life valuation is to compute potential lifetime earnings that a deceased person could realize due to enterprise adoption reasons. In aggregate, this is done by taking the average age of the workers in an enterprise deducted from the average life expectancy of the population at birth, and multiplying it by the average wage that the worker was receiving at time of loss of life. This exercise was done from data collected in the study districts and the remaining monetary value of life at current prices was found to range from

Rs.260,000 in Kailali to as high as Rs.1.42 million in Rupandehi district (Table 6.5). The life expectancy figure used here is the national average, and not specific to the district under consideration.

6.3 Sand Washing Establishments

The sand washing establishments –locally called *Phirphire* – were found mostly in Dhading district to cater for the needs of the Kathmandu valley. With a small investment of Rs. 700,000, an entrepreneur can make an annual net return of Rs. 1,833,000 (Table 6.5) which is very attractive. They more than recover the initial cost of investment within a single year.

Table 6.8: Annual earnings of self-employed and contracted manual workers in the SG&S sector

Particulars	Sunsari	Makwanpur	Dhading	Rupandehi	Kailali
Av. Daily earning (Rs.)	100	125	60	250	65
Number of days worked in a year	250	250	280	300	250
Average age	48	45	38	42	45
Life expectancy at birth	61	61	61	61	61
Annual earning (Rs.)	25,000	31,250	16,800	75,000	16,250
Remaining lifetime earning (Rs.)	325,000	500,000	386,400	1,425,000	260,000

Table 6.9: Phirphire economics

Establishment cost	700,000
Life	5 years
Mine cost	3150000
Maintenance cost (3%)	70,000
Staff salary	300,000
Total annual operating cost	4195000
Production/day (trucks)	7
Price per trip	4500
Annual work days	150
Total sales	4725000
Annual net profit	530000

estimated for four models – small, medium, large and large digitized systems. It is assumed that the establishments are run smoothly all year round. The basic parameters and revenue and cost figures are presented in Table 6.6, and the summary financial and economic analysis results are shown in Table 6.7. The detailed streams and computations are presented in Annexes 5 to 12.

The results show that, if policy distortions are absent, all size units have sound financial and economic returns ranging from 72.1 percent to 77 percent for the entrepreneurs (financial) and from 87.3 percent to 111 percent for the country (economic). The economic returns are higher than the financial returns in all cases, implying that the returns to the country from the investment are higher than to the entrepreneurs. Hence, the country needs to provide policy support to this industry. Further, there are economies of scale at play, meaning that the larger industries are making more financial profit.

6.4 Crusher Industries

Different sizes of crusher industries are operating in four of the study districts. Sunsari had only one crusher industry, which has now been closed. The economics of the crusher industry have been

Table 6.10: Basic production and price parameters and assumptions of crusher industries for financial and economic analysis

Expenditure items and production parameters	Type of crusher facility			
	Small	Medium	Large	Large digital
Number of staff	15	50	125	75
Investment Rs.	25,000	60,000	150,000	230,000
Annual workdays	275	275	275	275
Non-skilled workers of the total worker (%)	60	55	50	20
Electricity in HP	600	960	1,800	2,500
Diesel in liter	1,568	3,000	4500	5,000
Land Coverage (ha)	100	150	200	200
Insurance	150	300	600	700
Raw material				
Production (m3/year)				
➤ Sand	8,250	41,250	96,250	123,750
➤ Gravel	41,250	96,250	206,250	302,500
➤ Chips	20,625	48,125	103,125	151,250
Price/m3				
➤ Sand	400	400	400	400
➤ Gravel	450	450	450	450
➤ Chips	200	200	200	200
Total production value (Rs.)	25,987.5	69,437.5	151,937.5	215,875

Table 6.11: Financial and economic returns from different size crusher industries

Category	FIRR	EIRR
Small	74.4%	87.3%
Medium	72.1%	110.7%
Large	76.0%	90.2%
Large digital	77.0%	90.5%

6.5 Transporters

The transport business is either handled by stand-alone private truck owners who buy the product from crusher industries and deliver to the end-users, or construction companies, who hire drivers and helpers to transport products for them. Transportation dividends are also quite impressive, showing an 83 percent return to investment (Table 6.7 to 6.8). They recover their investments within 3 years of operation.

Table 6.12: Driver and helper annual salary

Particulars	Driver	Helper	Total
Basic salary/month	5,000	2,500	7,500
Annual salary	60,000	30,000	90,000
No. of trips per working day	2	2	2
Allowance per trip	250	150	400
No. of workdays in a year	180	180	360
Total income/year	150,000	84,000	234,000
Average Total income per month	12,500	7,000	19,500

Note: Based on case from Malekhu to Kathmandu, a distance of 70 km

6.6 Contractors

The profit of tax contractors could not be assessed due to some clandestine operations, but the DDC officials estimated that they have been making 25 percent profit after deducting all costs. If the tax contractors genuinely provided the receipts

Table 6.13: Stream of Cost and benefits from 6-wheel truck operation in sand transport

Year	Fixed cost	Operating cost	Material cost	Total cost	Annual revenue	Net benefit
1	2,000,000	1,156,000	990,000	4,146,000	2,970,000	-1,176,000
2		1,734,000	1,485,000	3,219,000	4,050,000	831,000
3		2,312,000	1,980,000	4,292,000	5,400,000	1,108,000
4		2,312,000	1,980,000	4,292,000	5,400,000	1,108,000
5		2,312,000	1,980,000	4,292,000	5,400,000	1,108,000
6		2,312,000	1,980,000	4,292,000	5,400,000	1,108,000
7		2,312,000	1,980,000	4,292,000	5,400,000	1,108,000
8		2,312,000	1,980,000	4,292,000	5,400,000	1,108,000
9		2,312,000	1,980,000	4,292,000	5,400,000	1,108,000
10		2,312,000	1,980,000	4,292,000	5,600,000	1,308,000
				\$27,744,575	\$32,919,686	83%
					1.19	

of tax payment, then it would be possible to calculate their profitability level by compiling the information from receipts. Without this crucial information, it is impossible to estimate the extremities of income disparities within the SG&S industry, or to approach the industry from a social justice standpoint.

6.7 An Important policy conclusion

The economics at various value chains of the sub-sector shows that, under normal policy circumstances, the returns to all stakeholders in the value chain are very high except for the road and

riverside poor workers. Their income in Kailali has dropped in both real and absolute terms: while income has increased by only 20 percent in last 5 years, the price of rice has doubled within the same period. In most other districts also, their daily income is less than the minimum daily wage rate of about Rs. 300 fixed by the DDCs. Besides, almost 60 percent of such workers have been fully displaced due to the influx of highly mechanized crusher industries. Hence, it can be concluded that the pro-poor stance of the sub-sector is declining. Both the centre and local governments should set aside some earnings from the sub-sector for compensatory poverty reduction works.

7

ISSUES

There are several burning issues within the SG&S sub-sector in Nepal which are related to the environment, market and prices, and the national policies governing the sub-sector. These issues are discussed below:

7.1 Conflict over Ownership

Because of contradictions between different Acts and regulations, there are conflicts about ownership and resource sharing between DDC, DFO, District Agriculture Development Office (DADO), Buffer Zones, and Community Forest User Groups. The LSGA 1999 provides full ownership authority to the local bodies for extraction and sales of SG&S, while the same authority is given by the Forest Act 1993 to DFOs for resources lying within forest areas. Local bodies claimed that their authority is more recent and should fully replace the provisions of earlier acts. The DFOs however, claim that the resource ownership provision has not been removed from their Sector Act. There have been several court cases regarding the settlement of disputes. In Sindhupalchok, the court finally gave the verdict in favour of the DDC. In many districts, the conflict is resolved by negotiations in revenue sharing.

In Sunsari, there is conflict between Community Forest User Groups and the DDC, the former claiming that the river has entered into the forest areas because of the heavy stone extraction activities by contractors. The study team orga-

nized a joint meeting between the district line agencies, including the DDC, and Community Forest User Groups, and the DDC agreed in principle to carry out bank protection works along the problematic rivers.

7.2 Diverse Context – Common Policy

Nepal is known for its diversity in various sectors. Such diversity is also found in the study districts with regard to the practices and contexts prevailing in the SG&S sub-sector. On the one hand, for example, there are problems of non-extraction of bed materials in districts like Kailali, and, Sunsari, and to some extent in Makawanpur district, leading to the excessive rise of riverbeds, threatening bridges, fertile farmland and residential areas.

On the other hand, there are problems of over-extraction in districts like Rupandehi, and in some parts of Makwanpur, resulting in riverbank erosion. Excessive extraction has, in the case of the Tinau river, also been beneficial in Rupandehi district where the high flood of 2009 could have been catastrophic in Butwal Municipality and surrounding areas if the riverbed had not been deepened by SG&S extraction. The same over extraction has caused the damage to Seuti bridge on the Koshi highway along the Biratnagar-Dharan-Dhankuta stretch. Therefore, the old bridge is being replaced with a new one at an estimated cost of Rs. 30 million. The case of an

unnamed bridge in Makawanpur district near Churiya Mai temple faced a rather unique situation threatened by over extraction towards the Churiya river side while the same bridge is being virtually clogged due to non extraction on the other side of the river. This leads to the conclusion that extraction may not always have negative effects and, by the same token, non-extraction will not always have positive effects. The effects depend upon the specific context. Therefore, it will not be advisable to formulate and implement a policy by looking at just a few situations. The diversity of contexts has to be acknowledged.

7.3 Criminalization, Rent-Seeking and the State of Impunity

The industries in SG&S sectors are thriving with very attractive returns to investment. Whenever returns are high in a sub-sector, there are two likely tendencies: the tendency for greater competition; and the tendency to seek rents from participation in the sub-sector. Both of these have simultaneously existed in the SG&S sub-sector. The “mafia” intervention in the sub-sector was found to be so high as to impede the harnessing of the benefits of very high returns from the sub-sector.

In some study districts, the study team was told about “mafia” operations controlling illegal exports of SG&S products, capturing contracts, carteling in contracts, not paying DDC tax as per contract (in Kailali), collecting ransom donations from the industries, transporting products without paying taxes, etc. These undesirable activities have come to the notice of the DDCs and district administration offices but no action has been taken, perhaps because of the security threats. If such a state of impunity continues unabated, it will spread to other districts. This calls for an intervention from the central government.

7.4 Issues of Compensation

The sub-sector industries have been discharging several obnoxious materials without paying any compensatory return to the affected parties. These include dust pollution, noise pollution and several other forms of pollution. The victims of these forms of pollution have never been compensated. Instead, any compensation has tended to benefit the better-off. On the pollution front, almost nothing has been done to penalize those responsible for environmental deterioration. This will affect the sustainability of the enterprises in the long run.

7.5 Ploughing Back of Resources

The local bodies have been able to raise significant tax and other revenues from the SG&S sub-sector. However, these revenues have not been sufficiently ploughed back into the protection of the revenue sources – the rivers. In ploughing back, there is no resource mobilization between and within sub-sectors. The revenue from the SG&S is pooled with the total resources of the DDC and invested in general and sector programmes of the DDC. A large share of the revenues derived from the SG&S sub-sector has instead financed heavy equipment based road construction, leading to further environmental problems. The study team found that Dhading and Kailali districts have invested virtually nothing in the revenue generating rivers while Sunsari, Makwanpur and Rupandehi districts have invested only modest amounts in recent years. In Rupandehi, DDC revenues have been ploughed back by investing in activities related to environmental compliance and Chure/hill protection. The highest budgetary allocation has been in Sunsari district at 14.9% of total annual DDC expenditure. This, however, is not the highest allocation in absolute terms and only appears relatively high because of the DDC’s low expenditure budget.

7.6 Export Potential of Nepali SG&S

Construction is booming in large urban centres such as Kathmandu, Chitwan, Biratnagar, Pokhara, Bhairawa, Butwal and Nepalgunj and in emerging towns such as Kohalpur, Itahari, Bardibas, Birtamod, etc. Kathmandu, as the capital city, is the largest domestic market for SG&S products. Road construction work in the country is also progressing rapidly and has been another important source of demand for the SG&S products. However, the growth in supply has been larger than the growth in domestic demand although this has not been reflected in the supply prices which have increased substantially and at a pace faster than inflation in the national economy.

Regarding the export market, there is high demand for Nepali SG&S products in neighboring states of India such as West Bengal, Bihar, UP and Uttaranchal. The current high growth rate in Bihar and associated construction boom is the major factor in explaining the increase in the Indian demand. Demand from the northern neighbor China is virtually zero. In the case of India, Nepali products have penetrated from 50 to 150 kilometres from the border, reaching such towns as Bareilly, Gorakhpur and Lakhimpur Khiri. Beyond that point, Nepalese products are not competitive both in terms of quality and price. The demand for Nepali products is also favored by the existence of narrow gauge railway system in the bordering areas which makes Indian SG&S products expensive due to high transportation costs. Once these narrow gauge systems are replaced by broad gauge systems, the competitive edge of Nepal in SG&S exports will fall drastically unless production efficiency is considerably improved. It is reported that Nepali products are only used within India at the level of around 3 percent in construction and 1 percent in roads.

7.7 Quality of Nepali SG&S

Nepali SG&S products are almost entirely extracted from riverbeds, which contain mixed materials of different strengths, textures, looks and colours. This results in final products which are not uniform. This lack of uniformity has a negative impact on quality. Quarry mining has begun to be practiced only for sand, which is also heavily mixed with clay and thus needs double washing for purification. The river bed sand from Nepalese rivers is reported to have a high mica content (up to 30 percent), considerably higher than the acceptable upper limit of 8 percent. In India, SG&S materials are drawn from large quarries which produce large and uniform final products. Nepalese materials are also generally weaker due to the young geology of Nepal. So, Nepalese products are lower in quality compared to Indian products. Generally speaking, the quality of Nepali SG&S products is not within acceptable limits for large construction works.

7.8 Issues of Sustainability

Sustainability issues are discussed in terms of raw materials sources and the overall SG&S industry. With regard to sources, the extraction of raw materials will be sustainable only if the annual replenishment level is not exceeded. This could also be reduced if large-scale conservation works are undertaken in the Churiya range, which is one of the major sources of raw materials. In terms of the overall industry, the current high growth rate is very largely dependent on the export market.

If environmental degradation continues, returns from the industries will be lower than the value of environmental losses - something which the industry cannot sustain in the long run.

7.9 Relationship Analysis of Export Market

It is important to know why some districts have a limited number of rivers and streams and yet produce and export more SG&S products than other districts with abundant raw material resources. The case in point is Rupandehi district which has only one exploitable river –the Tinau – but is exporting and generating an annual tax revenue of over Rs. 150 million, while Kailali district, with seven exploitable rivers, has been generating only a maximum of Rs.5 million in annual revenues.

This is explained by the higher population and consequently the higher demand in the market across the border, and higher growth rates, therefore higher demand for construction material in the export market. When the quarry hill is farther from the export market, the import demand for construction materials is higher. And, farther distance to broad gauge rail transportation from the Nepal border, the more the export penetration distance.

All these variables have favoured the study districts in the following order: Rupandehi, Makwanpur, Sunsari are the most favoured, and the least favoured district is Kailali. Kailai's po-

tential export market across the border in Uttaranchal State is thinly populated; has closer access to the Nainital hills which provides an alternative source of supply from the crusher industry in Lalkuwa, and has a slower economic growth rate compared to that in Bihar and UP. Therefore, despite being the best endowed district in terms of SG&S resources, Kailai has not been able to generate high levels of revenue. Furthermore, the Far Western region, where Kailali is located, is itself poorer compared to other regions. This factor has constrained even the domestic market. But, high population density across the border and Bihar's booming growth rate have provided sufficient import demand for Rupandehi, Makwanpur and Sunsari districts, allowing them to generate higher levels of revenue from SG&S exports.

In the hills, districts closest to the Kathmandu valley, such as Kavre, Sindhupalchok, Dhading and Nuwakot, are faring well in terms of revenue generation from SG&S. Other districts like Sindhuli, Ramechhap and Dolakha, despite having plenty of rivers like Sunkoshi, Tamakoshi and their tributaries, have not been able to generate SG&S-related revenues because of their distance to domestic markets and the very limited demand for exports in the thinly populated Tibet region of China.

8

RECOMMENDATIONS

Based on the study findings, the following recommendations have been made to ensure sustainable extraction, sales and exports of SG&S products and to augment the resources of the local bodies. These recommendations are presented in their order of priority.

8.1 Recommendations for GoN

Promulgate a more Stringent Act against illegal mining

- ◆ A more stringent Act should be formulated, promulgated and effectively enforced for punishing and sanctioning illegal mining to end the current state of impunity; and,
- ◆ When licenses for SG&S processing industries are issued by the Ministry of Industry, they should specify the proportion of product to be set aside for meeting local demand on a priority basis.

Improve road design standards

- ◆ It is high time that Nepal upgrades the design standards for roads to allow large scale transport of goods. Nepal's unit transport cost for goods is already very high due to the absence of cheaper sea and rail transport. This is important not only for the SG&S sub-sector but also for other sectors where transport costs have been prohibitive. A road design upgrading fund can be created within the

SG&S sub-sector by mobilizing contributions from the high return stakeholders including the DDCs. Furthermore, even the existing stipulated design standards are not adhered to by the road construction contractors. For example, why are some particular sections of the roads more damaged than other sections? It is due to non-compliance with specified standards on the part of contractors. Obviously, there are some situational variables that explain part of the problem. The road slope, the terrain, and the exposure time of the roads to sun seem to make some difference. More road problems are seen in Dhading district where these unfavourable situations exist. Consider the case of Rupandehi where local bodies derive maximum revenue from SG&S export, but where road conditions are acceptable.

8.2 Recommendations for the Ministry of Local Development and for Local Bodies

A. General recommendations

Resource pricing

This study recommends that, with guidance from MoLD, DDCs should establish mechanisms for SG&S resource pricing. This study proposes a nominal resource price of Rs.0.5 per cubic feet at

extraction sites. If this resource price is multiplied by the safe annual extraction levels recommended by the IEE reports, it will provide each district with additional revenues. If this recommendation is accepted, the study districts will gain incremental revenues of at least Rs. 1.67 million per year (see table 6.4. below). According to the table, Dhading can realize an additional annual revenue of Rs.1.67 million with resource pricing while Makwanpur can realize as much as Rs.9.38 million. This is computed by the recommended nominal resource pricing level of Rs.0.50 per cubic feet or Rs.16.23 per cubic metre of SG&S raw material multiplied by the environmentally safe raw material extraction levels for each district as recommended by the respective district IEE reports. The cost of administering the permit system and monitoring is assumed at 5 percent of the total revenue to arrive at the net incremental revenue from resource pricing. The resource prices have been recommended at very nominal levels in order not to reduce the export competitiveness of the industry.

A general picture was drawn from these and other data. The revenue realized and expenditure incurred by the DDCs in the study districts are presented in Annex 7.

Section 218 of LSGA provides for both sales of and taxation on natural resources by DDCs. However, in almost all study districts except in

buffer zone areas, SG&S resources are not priced, and are only taxed through contractors or districts' own *amanat* system during transportation. SG&S resources from rivers are extracted free of cost and in any amount, as the extractors please. Not pricing the resources is not an acceptable system. Resource pricing is only practiced in buffer zone areas where Rs. 56 per cubic metre is charged at the point of extraction. It appears that DDCs are not practicing resource pricing because of the administrative difficulties involved. Some DDCs interpreted the transport tax that is currently raised to include the price of the resource. And, the crusher industries also consider that the charges paid as tax already include the price of the resource. They believe that adding a separate price to the current tax would decrease their competitiveness in the export market.

If the resource is to be priced – as it should be – then there should be permit systems for each environmentally safe extraction location identified by the IEE reports. The permit cost will then be the value of the resource. Management of the permit system could be out-sourced to private sector tax farmers through multiple auctions for each safe extraction location identified by the respective district IEE reports. To initiate the resource pricing system, extraction areas will need to be zoned. Permits clearly specifying the volume to be extracted and method to be used in extraction for each extraction zone should be is-

Table 8.1: Incremental Revenue Generation with Resource Pricing

Particulars	Kailali	Makwanpur	Dhading	Sunsari
Environmentally safe annual extraction levels recommended by the District IEE reports (cubic metres)	109,000	608,389	108,456	110,000
Recommended resource price to be administered through a system of permit (Rs./cubic metres)	16.23	16.23	16.23	16.23
Additional revenue through resource pricing system	1,769,070	9,874,153	1,760,241	1,785,300
Resource extraction permit administration and monitoring cost (5%)	88,454	493,708	88,012	89,265
Net incremental revenue from resource pricing	1,680,617	9,380,446	1,672,229	1,696,035

sued by the DDC and the cost of permit will be the value of the resource. This way, multiple permits can be issued for a single river. Resource pricing could be a sensible way of increasing DDC revenues.

Resource pricing offers two important benefits: a more stringent and sustainable management of SG&S extraction; and enhanced local revenues. If pricing is nominal, as is suggested by this study, it will not lead to any loss of competitiveness or major increases in consumer prices.

As a first step, MoLD should consider implementing resource pricing on an intensive pilot basis in a selected number of DDCs. Piloting would enable MoLD and local bodies to test improved SG&S resource management practices with regards to location, quantities, methods, etc., gradually identify the optimal methods for permit and revenue management, and experiment with new and more robust monitoring and supervision arrangements. As and when such pilots generate lessons learned, they can then be scaled up to all DDCs.

Quality assurance of IEE/EIAs

IEE/EIAs, conducted by DDCs, are expected to play an important role in reforms to SG&S resource and revenue management. The success or failure of such reforms will therefore depend on the quality of IEE/EIAs. It is therefore recommended that MoLD establish a mechanism for quality assurance of DDC IEE/EIAs. This could include drafting updated and comprehensive guidelines on IEE/EIA studies for DDCs. Most importantly, it is recommended that MoLD's Environment Section out-source *ex post* and regular evaluations of DDC IEE/EIAs to determine whether such studies are of the required quality and consistency. In the light of such evaluations, and in the event that the quality of IEE/EIAs can be improved, MoLD should issue new recommendations and guidelines to DDCs.

SG&S management guidelines for DDCs

Given the fiscal importance of SG&S-derived revenues to DDCs, the need to ensure that SG&S products are extracted in environmentally

friendly ways, and to honestly evaluate existing weaknesses in DDC revenue administration and collection, MoLD should consider issuing guidelines to DDCs on SG&S resource and revenue management. These guidelines should include the following elements:

- ◆ **IEE/EIAs:** In line with existing regulations (see Section 5.4 above), DDCs should be reminded that the extraction of SG&S resources within their jurisdictions is subject to IEE/EIAs being conducted. IEE/EIA studies should be used by DDCs: (i) to indicate where SG&S products can be extracted; (ii) to determine the quantities of SG&S products that can be safely and wisely extracted; and (iii) on the basis of SG&S extraction potential, to estimate the value of tax farming contracts. Each DDC should implement the recommendations proposed by its IEE/EIA report for environmentally safe extraction of SG&S materials from the rivers. Some of the common and general recommendations have been compiled elsewhere in this report.
- ◆ **Resource pricing:** DDCs should be encouraged to establish resource pricing mechanisms, such that SG&S extraction is subject to the issue of permits (see above).
- ◆ **Tax farming practices:** DDCs will be expected to undertake a number of actions to improve the efficiency of tax farming. Firstly, estimates of potential revenues from taxes on the transport of SG&S products will be based on IEE/EIA estimates of what can be realistically and safely extracted, rather than on *ad hoc* projections. This would almost certainly result in tax farming contracts that would be more favourable to DDCs. Secondly, DDCs should increase the transparency of the process of procuring SG&S tax farmers, in ways that maximize competition amongst bidders, maximize the potential for revenue collection for DDCs, and minimize opportunities for collusion.
- ◆ **Revenue sharing arrangements:** current revenue-sharing arrangements vary considerably between one DDC and another. In some cases, DDCs appear to be using equitable formula for sharing SG&S revenues with VDCs, municipalities and other stakeholders.

In others, however, revenue sharing processes are unclear and, in all likelihood, unfair. It is therefore recommended that MoLD provide DDCs with clear guidance on how and on what basis to share SG&S revenues, with a view towards ensuring equitable outcomes. In addition, MoLD may wish to consider increasing the minimum proportion of SG&S revenues that are shared by DDCs – the current minimum is set at 35 percent. Sharing the resources from SG&S to the central government should also be considered in the future because the SG&S product is transported through the national highways whose maintenance liability rests with the central government.

- ◆ **Ploughing back SG&S revenues:** DDCs should be encouraged to plough back at least 20 percent of their SG&S revenue earnings from each river where extraction takes place, for river protection works such as embankments, putting concrete slabs to demarcate depths up to where the extraction can take place and putting hoarding boards showing safe extraction measures and locations. DDCs should also allocate another 10 percent of their SG&S revenues to finance compensation and safety funds for riverbed workers and victims of environmental degradation. Finally, DDCs should be expected to use some of their SG&S revenues to finance monitoring and supervision of the sub-sector.
- ◆ **Monitoring and Evaluation and supervision of extraction/transportation:** DDCs will need to improve the monitoring and supervision of SG&S resource and revenue management. Tighter and more robust resource management rules regarding location of SG&S extraction sites, quantities extracted, etc., will require good monitoring and supervision to ensure compliance. Tracking of revenue streams should also be improved by regularly comparing extraction permits, tax farming revenues from SG&S transport, and export permits, with a view towards ensuring that there are no obvious leakages, or loopholes to be exploited.

B. Specific Recommendations

Improve the industry monitoring system

- ◆ DDCs should set up high level monitoring committees for the SG&S sub-sector, chaired by the CDOs and including the representatives of district level stakeholders. This, however, should be a policy level body and cannot address day-to-day monitoring requirements. Besides, field level monitoring cannot be done without involving local communities. Hence, DDCs should constitute functional monitoring units for each river and extraction location identified by the respective district's IEE report, and should appoint local river wardens. These wardens may not be able to take action against wrong-doers on their own but will serve as informants to the district monitoring committee for necessary action. These local monitoring committees and river wardens must be oriented on what to monitor and what activities constitute environmental offences, again based on the monitoring recommendations in the IEE reports.

Demarcate the river right-of-way and safe extraction zones

- ◆ River rights-of-way have been encroached in several rivers with the most prominent example being the Tinau river in Rupandehi. DDCs should clearly demarcate the river right of way and the safe extraction zones as identified by the IEE reports.

Control piling of SG&S products by the roadside

- ◆ The study team found SG&S products being piled by the roadside, reaching beyond the road shoulder up to the paved surface. Such practices have reportedly caused serious accidents and even deaths. Such practices should be effectively monitored and controlled, with penalties enforced upon offenders. No one should be allowed to store or pile sediment and SG&S products within 10 meters on either side of a highway and within 5 meters on either side of access roads.

Formulate and implement social mobilization package for river workers

- ◆ Many people working in river valleys for SG&S extraction and processing are poor and illiterate, and therefore, usually unaware of proper and sustainable extraction methods, safety measures and existing state regulations. Therefore, DDCs should prepare social mobilization packages targeted at workers and aimed at promoting good extraction practices, knowledge of safety measures and existing regulations.

Other recommendations for DDCs

- ◆ One copy (yellow coloured) of the receipt issued during tax collection by the tax contractor is sent to the DDC. This information should be compiled by DDCs to monitor the quantity of SG&S products that have been extracted, and to ensure that revenue collection has been honest.

8.3 Recommendations for Environmentally safe extraction

Technical, managerial and legal requirements for the safe extraction of SG&S raw materials from the rivers have been specified in several reports (Goulburn Broken, work on waterways note no. 4, district IEE reports, CA Natural Resource Committee report, etc.). These have been compiled and reproduced here as recommendations for environmentally safe extraction of SG&S raw materials from rivers.

- ◆ The preferred approach is for extraction to move upstream and occur above the low flow water level.
- ◆ Rehabilitation should be undertaken concurrently with the works. Where buffer zones are required, these should be established before the extraction commences.
- ◆ The finished slopes must be stable. Maximum slopes at the upstream and downstream of the site should be 1(vertical):10(horizontal), with side slopes of 1(v):3(h).

- ◆ Effective measures should be specified to minimize turbid water leaving the site from access tracks and work areas. Such measures and guidelines are set out in the Environment Protection Authority Publication 275, Construction Techniques for Sediment Pollution Control (1991).
- ◆ No machinery with defective hydraulics that could discharge fluid should be permitted in the stream environment. Extraction should be done only from the annually deposited mass.
- ◆ Large rocks and boulders should not be broken out or removed from river because, on the one hand, such rocks control the river velocity and, on the other, they provide aquatic animals with shelter and breeding grounds.
- ◆ Vehicles should not be allowed to cross river channels from more than one passage on one side.
- ◆ Provision should be made for proper storage zones nearby the extraction sites.
- ◆ Vehicles should not be allowed to use power horns, particularly in animal conservation areas.
- ◆ Vehicles should not be allowed to operate at night (6 pm to 7 am).

1.4 Recommendations for the SG&S Industries

- ◆ Crusher industries contribute to the local communities in the form of road construction, support for schools, local jobs, etc., but their contributions seem to have been misdirected. They are supporting heavy-equipment based road construction which does not employ poor workers. It is also likely to damage the local environment. The support to the schools also disproportionately helps the richer segments of the society. They are also providing donations to criminal groups and wealthier institutions. Hence, the crusher industries should redesign their compensation mechanisms towards benefiting the real losing parties who are generally the poorest members of their local communities.

- ◆ Provide adequate safety measures such as masks, scarves, gloves, helmets, first aid kits, boots, etc., to their labourers and other workers employed or contracted for SG&S extraction, transport and processing.
- ◆ Health, accident and life Insurance policies should be provided to the labourers and other workers.
- ◆ Domestic end-consumers of SG&S products are complaining about the domestic scarcity of the products, as well as high prices. Hence, the industries within a district should set aside SG&S products for the domestic market.

1.5 Other Recommendations

Control extraction from only one side of a river

- ◆ In many big rivers like the Trishuli, the Sunkoshi and the Indrawati, SG&S raw materials are being extracted from only one side of the river. This should not be allowed without proper measures to control tilting of the rivers to one side which increases the probability of the river cutting its bank. If such

extraction is unavoidable, then extraction should be done at least 25 metres away from the actual river bank.

Identify alternative mining sites

- ◆ Quarries constitute alternative sources of boulders and gravel. But, in the short and medium terms, extraction of easily and abundantly available riverside materials is more environment-friendly. In the long run, mining sites located in unpopulated hills with scarce vegetation will need to be identified.

Need for an elaborate study

- ◆ The current study had to be done within a limited period and using crude estimates, aggregated data, lack of authentic parameters and virtually no field measurements. Given the importance of the subject, it is recommended that the study should be done more elaborately, covering one annual cycle, so that the seasonal dimensions of the sub-sector can be more thoroughly understood. Visits to Indian markets for Nepali SG&S products could also be undertaken within the framework of a more comprehensive study.

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ANNEXES

ANNEX 1: Legal provisions for SG&S sales and taxation

The current legal basis upon which local bodies levy taxes on sand/gravel extraction is the Local Self-Governance Act (LSGA), enacted in 1999. LSGA (see text box 1 below) specifically empowers DDCs (but not VDCs or Municipalities) to levy taxes on sand/gravel extraction.

In addition to this provision for the taxation of sand/gravel extraction, LSGA also allows DDCs to sell sand/gravel (see text box 2) – although it is somewhat unclear as to how revenue raised from a sale should or can be distinguished from revenue raised by taxing the exploitation of specific resources.

In both cases of tax and sale DDCs are expected to share any revenues with the “concerned” VDCs and municipalities, which is assumed to mean those VDCs and municipalities from whose geographical jurisdictions sand/gravel is either being taxed or sold.

With regard to DDC taxes on sand/gravel, as with all other taxes, fees and charges, taxation rates are specified in an annex to the Local Self-Governance Regulations (LSGR – Art. 207). For the sale of sand/gravel, LSGR does not set any

rates, but does include clauses concerning the conditions under which such sales can take place (see text box 3).

There is, then, a sound legal basis for DDCs to levy taxes on sand/gravel, as well as to sell sand/gravel, albeit subject to certain conditions.

However, it should be noted that local governments are not the only institutions empowered by law to levy taxes or charges on sand/gravel. Forest User Groups are also allowed to do so within their respective jurisdictions.

Text Box 1: LSGA PROVISIONS FOR LG TAXATION OF SAND/GRAVEL

Art. 215: Taxes the District Development Committee is Entitled to Impose

- (1) The District Development Committee may impose tax on roads, paths, bridges, irrigation, ditches, ponds etc., built by or transferred to it, at the rate approved by the District Council not exceeding the rate as prescribed in the district development area.
- (2) The District Development Committee may impose tax on wool, turpentine, herbs, worn and torn goods, stones, slates, sand and bone, horn, wing, leather etc. of the animals except those prohibited, pursuant to the prevailing law and on other goods as prescribed at the rate approved by the District Council not exceeding the rate specified in the district development area.
- (3) Upto 35-50% of the amount obtained from the tax referred to in sub-section (2) shall have to be provided to the concerned Village Development Committee and the Municipality.

Text Box 2: LSGA PROVISIONS FOR THE LG SALE OF SAND/GRAVEL

Art. 218: Sale

The District Development Committee may sell, as prescribed, the sand in the rivers and canals, roda, stones, soil, wood swept by river, etc. lying in its area. Out of the proceeds of such sale of goods, upto 35-50% amount shall have to be provided to the concerned Village Development Committee and the Municipality.

Text Box 3: LSGR PROVISIONS FOR THE LG SALE OF SAND/GRAVEL

Art. 210. Power to Sell

A District Development Committee may, subject to the following provisions, sell or cause to sell the sand of rivers, aggregate, stone, slate, soil and the dry woods pursuant to Section 218 of the Act:

- a) If the concerned body of His Majesty's government has sent a letter along with a technical report stating that it is not appropriate from environmental viewpoint to excavate soil, sand, aggregate, stone etc., or to operate mines or to extract out such things from a river or riverbank, or if the concerned Village Development Committee or Municipality or District Development Committee has sent a letter along with a technical report stating that it is not appropriate to excavate in that way or to operate mines, such operation of mines and soil excavation works shall have to be closed immediately.
- b) No soil, stone, sand and aggregate shall be excavated or caused to be excavated from any place within the boundary of national forests or government forests without an approval of the concerned body and no dry woods flown by rivers and are blocked or lying within the forest boundary shall be taken out, collected or sold or distributed.

ANNEX 2: Detailed income and expenditure account of Sunsari DDC, 2006/07 to 2009/10

	Budget head	Actual	Actual	Estimate	Estimate	Slope (2006/07 to 2009/10)
	Nepali FY	2063/64	2064/65	2065/66	2066/67	
	Western FY	2006/07	2007/08	2008/09	2009/10	
	Income					
	Domestic Source		17888304	23355774		5467470
1.1.2	Source use tax	7809526	16016448	19763864	22200000	4691884
1.3.1	Fees	139239	76721	91000	121000	-4043.8
	SG&S district sales	630000	4140000	4275464	5000000	1324546
1.3.2.2	SG&S Export permit	1910000	1438637	3335555	4000000	816692
1.4.1	SG&S sales value	5758798	11105137	18100000	22000000	5571847
	Total SG&S tax	2540000	5578637	7611019	9000000	2141238
	Total SG&S	8298798	16683774	25711019	31000000	7713085
	SG&S tax (% of resource use tax)	32.5	34.8	38.5	40.5	2.8
1.3.2	Total permit fee	1955267	1654437	3570555	4005000	806532
1.3.3	Renewal fee	347635	369400	390000	400000	17770
	Share of SG&S (% of permit fee)	97.7	87.0	93.4	99.9	1.3
1.4	Total income from sales	6216630	11755580	18772500	22420000	5562703
	SG&S sales as % of total sales	92.6	94.5	96.4	98.1	1.8
1.6	Penalty/fine	43303	800	10000	10000	-9071
1.7	Revenue sharing	27786407	27683604	29100000	30400000	925718
1.9	Other income	4207832	2509624	1510000	6430000	566688
	TOTAL Domestic Source	48505839	77954918	96563693	85986000	13104926
		48505837	73601079	96563993	85986000	13540340
	SG&S (% of internal)	17.1	21.4	26.6	36.1	6.2
		2	4353839	-300	0	-435415
	External Source					
1.10	Grant					
1.10.1	Minimum GoN Grant	98770688	110744347	188162000	443995000	111309059
1.10.2	Grant in kind (GoN)					
1.10.3	Additional grant					
1.11	Grant from foreign aid	15814992	28100789	98000000	333243415	102218448
1.12	Loan					
	TOTAL External	114585680	138845136	286162000	777238415	213527507
	TOTAL	163091519	216800054	382725693	863224415	226632433
	Internal (% of total)	29.7	36.0	25.2	10.0	-7.0
	SG&S (% of total)	5.1	7.7	6.7	3.6	-0.5

Expenditure

	Budget head	Actual	Actual	Estimate	Estimate	Slope (2006/07 to 2009/10)
1.01.1	Staff Salary	1869648	2421306	2900000	3000000	386975
1.01.2	Remuneration		9000		400000	195500
1.01.3	Staff welfare fund	200000	200000	250000	250000	20000
1.01.4	Insurance premium		198000	200000	200000	1000
1.02.1	Staff allowances	1538793	2054980	2540000	2540000	348864
1.02.2	Officials allowances				250000	
1.02.3	Meeting allowances	196800	159283	100000	200000	-4968
1.03	Travel and DSA	4620	41532	50000	50000	14461
1.04	Uniform	85500	24000	30000	30000	-16050
1.05	Food and nutrition					
1.06	Medical expense	208088	0	50000	100000	-27426
1.07	Retirement benefit					
1.08	Training	86500				
2.01	Water and electricity	58103	70051	75000	75000	5564
2.02	Telephone	185664	180819	200000	200000	6219
2.03	Office expenses	1870912	1748822	1760000	1800000	-20156
2.04	Rent	169933	245000	250000	250000	24520
2.05	Repair & maintenance	682911	423521	400000	500000	-57225
2.06	Fuel	846893	669222	1075000	900000	56510
2.07	Consultancy and other services	4200	13820	25000	50000	14858
2.08	Miscellaneous	431111	847690	1070000	1120000	228898
3.01	Institutional grant		500			
3.02	NGO, Club grant		15000			
3.03	Education, health, social grant		146150	400000		253850
3.04	Social security grant		0	150000		150000
4.03	Books	13960	19390	25000	25000	3873
4.04	Program expenses	192698	12370	100000		-46349
4.05	Program travel expenses	676278	498211	500000	500000	-52705
9.01	Contingency		0	200000	200000	100000
12.01	Return expenses	1127577	785284	25000	200000	-354302
	TOTAL	10450189	10783951	12375000	12840000	876048
		10450189	10919447	12671500	13450000	1075149
		0	-135496	-296500	-610000	-199100

Capital Expenses

	Budget head	Actual	Actual	Estimate	Estimate	Slope (2006/07 to 2009/10)
6	Furniture/equipment		561123	400000	350000	-105562
6.05	Public construction		35024735	63617193	48186000	6580633
8	Grant to local bodies					
8.02.01	Grant to VDC/Municipalities		12558000	11000000	14000000	721000
8.02.02	Grant to UCs					
8.02.03	Grant to NGO, clubs		47200	300000	300000	126400
8.03	Grant to service institutions					
8.03.01	Education		3078828	6000000	8000000	2460586
8.03.02	Health		322999	900000	900000	288501
8.03.03	Social sector		228500	300000	300000	35750
9.02	Contingency		0	400000	500000	250000
	Total		51821385	82917193	72536000	10357308
	TOTAL EXPENSES		62605336	95292193	85376000	11385332

ANNEX 3: Stream of financial cost and benefits from a medium crusher operation

Year	Fixed cost	Operating cost	Material cost	Total cost	Annual revenue	Net benefit
1	25000	2275	960	28235	6496.875	-21738.125
2		3412.5	2400	5812.5	19490.625	13678.125
3		4550	3200	7750	25987.5	18237.5
4		4550	3200	7750	25987.5	18237.5
5		4550	3200	7750	25987.5	18237.5
6		4550	3200	7750	25987.5	18237.5
7		4550	3200	7750	25987.5	18237.5
8		4550	3200	7750	25987.5	18237.5
9		4550	3200	7750	25987.5	18237.5
10		4550	3200	7750	28237.5	20487.5
Present value and IRR				\$92,199	\$174,693	74.4%
B/C Ratio					1.89	

ANNEX 4: Stream of financial cost and benefits from a medium crusher operation

Year	Fixed cost	Operating cost	Material cost	Total cost	Annual revenue	Net benefit
1	60000	9514	1950	71464	17359.375	-54104.625
2		14271	4875	19146	52078.125	32932.125
3		19028	6500	25528	69437.5	43909.5
4		19028	6500	25528	69437.5	43909.5
5		19028	6500	25528	69437.5	43909.5
6		19028	6500	25528	69437.5	43909.5
7		19028	6500	25528	69437.5	43909.5
8		19028	6500	25528	69437.5	43909.5
9		19028	6500	25528	69437.5	43909.5
10		19028	6500	25528	74837.5	49309.5
Present value and IRR				\$231,246	\$428,219	72.1%
B/C Ratio					1.85	

ANNEX 5: Stream of financial cost and benefits from a large crusher operation

Year	Fixed cost	Operating cost	Material cost	Total cost	Annual revenue	Net benefit
1	150000	15325	2880	168205	37984.375	-130220.625
2		22987.5	7200	30187.5	113953.13	83765.625
3		30650	9600	40250	151937.5	111687.5
4		30650	9600	40250	151937.5	111687.5
5		30650	9600	40250	151937.5	111687.5
6		30650	9600	40250	151937.5	111687.5
7		30650	9600	40250	151937.5	111687.5
8		30650	9600	40250	151937.5	111687.5
9		30650	9600	40250	151937.5	111687.5
10		30650	9600	40250	165437.5	125187.5
Present value and IRR				\$402,820	\$910,578	76.0%
B/C Ratio					2.26	

ANNEX 6: Stream of financial cost and benefits from a large digital crusher operation

Year	Fixed cost	Operating cost	Material cost	Total cost	Annual revenue	Net benefit
1	230000	16985	3360	250345	53968.75	-196376.25
2		25477.5	8400	33877.5	161906.25	128028.75
3		33970	11200	45170	215875	170705
4		33970	11200	45170	215875	170705
5		33970	11200	45170	215875	170705
6		33970	11200	45170	215875	170705
7		33970	11200	45170	215875	170705
8		33970	11200	45170	215875	170705
9		33970	11200	45170	215875	170705
10		33970	11200	45170	236575	191405
Present value and IRR				\$506,279	\$1,284,834	77.0%
B/C Ratio					2.54	

ANNEX 7: Stream of economic cost and benefits from a small crusher operation

Year	Fixed cost	Operating cost	Material cost	Total cost	Annual revenue	Net benefit
1	19451.25	1990.25	912	22353.5	5847.1875	-16506.313
2		2985.375	2280	5265.375	17541.563	12276.188
3		3980.5	3040	7020.5	23388.75	16368.25
4		3980.5	3040	7020.5	23388.75	16368.25
5		3980.5	3040	7020.5	23388.75	16368.25
6		3980.5	3040	7020.5	23388.75	16368.25
7		3980.5	3040	7020.5	23388.75	16368.25
8		3980.5	3040	7020.5	23388.75	16368.25
9		3980.5	3040	7020.5	23388.75	16368.25
10		3980.5	3040	7020.5	25526.25	18505.75
Net Present Value and IRR				\$82,690	\$159,565	87.3%
B/C Ratio					1.93	

ANNEX 8: Stream of economic cost and benefits from a medium crusher operation

Year	Fixed cost	Operating cost	Material cost	Total cost	Annual revenue	Net benefit
1	46683	5770.68	1852.5	54306.18	16491.406	-37814.774
2		8656.02	4631.25	13287.27	49474.219	36186.949
3		11541.36	6175	17716.36	65965.625	48249.265
4		11541.36	6175	17716.36	65965.625	48249.265
5		11541.36	6175	17716.36	65965.625	48249.265
6		11541.36	6175	17716.36	65965.625	48249.265
7		11541.36	6175	17716.36	65965.625	48249.265
8		11541.36	6175	17716.36	65965.625	48249.265
9		11541.36	6175	17716.36	65965.625	48249.265
10		11541.36	6175	17716.36	71095.625	53379.265
Net Present Value and IRR				\$171,850	\$407,952	110.7%
B/C Ratio					2.37	

ANNEX 9: Stream of economic cost and benefits from a large crusher operation

Year	Fixed cost	Operating cost	Material cost	Total cost	Annual revenue	Net benefit
1	116707.5	13268.45	2736	132711.95	34185.938	-98526.0125
2		19902.675	6840	26742.675	102557.81	75815.1375
3		26536.9	9120	35656.9	136743.75	101086.85
4		26536.9	9120	35656.9	136743.75	101086.85
5		26536.9	9120	35656.9	136743.75	101086.85
6		26536.9	9120	35656.9	136743.75	101086.85
7		26536.9	9120	35656.9	136743.75	101086.85
8		26536.9	9120	35656.9	136743.75	101086.85
9		26536.9	9120	35656.9	136743.75	101086.85
10		26536.9	9120	35656.9	149568.75	113911.85
Net Present Value and IRR				\$344,373	\$822,122	90.2%
B/C Ratio					2.39	

ANNEX 10: Stream of economic cost and benefits from a large digital crusher operation

Year	Fixed cost	Operating cost	Material cost	Total cost	Annual revenue	Net benefit
1	178951.5	15181.57	3192	197325.07	48571.875	-148753.2
2		22772.355	7980	30752.355	145715.63	114963.27
3		30363.14	10640	41003.14	194287.5	153284.36
4		30363.14	10640	41003.14	194287.5	153284.36
5		30363.14	10640	41003.14	194287.5	153284.36
6		30363.14	10640	41003.14	194287.5	153284.36
7		30363.14	10640	41003.14	194287.5	153284.36
8		30363.14	10640	41003.14	194287.5	153284.36
9		30363.14	10640	41003.14	194287.5	153284.36
10		30363.14	10640	41003.14	213952.5	172949.36
Net Present Value and IRR				\$433,978	\$1,159,119	90.5%
B/C Ratio					2.67	

Several rivers run through Nepal's Middle Himalayas, including the Seti, Karnali, Bheri, Kali Gandaki, Trisuli, Sun Kosi, Arun, and Tamur. Here, most rivers converge and form

four main river systems: the Karnali, Narayani, Gandaki, and Koshi, which traverse the Mahabharat Range through deep gorges.



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