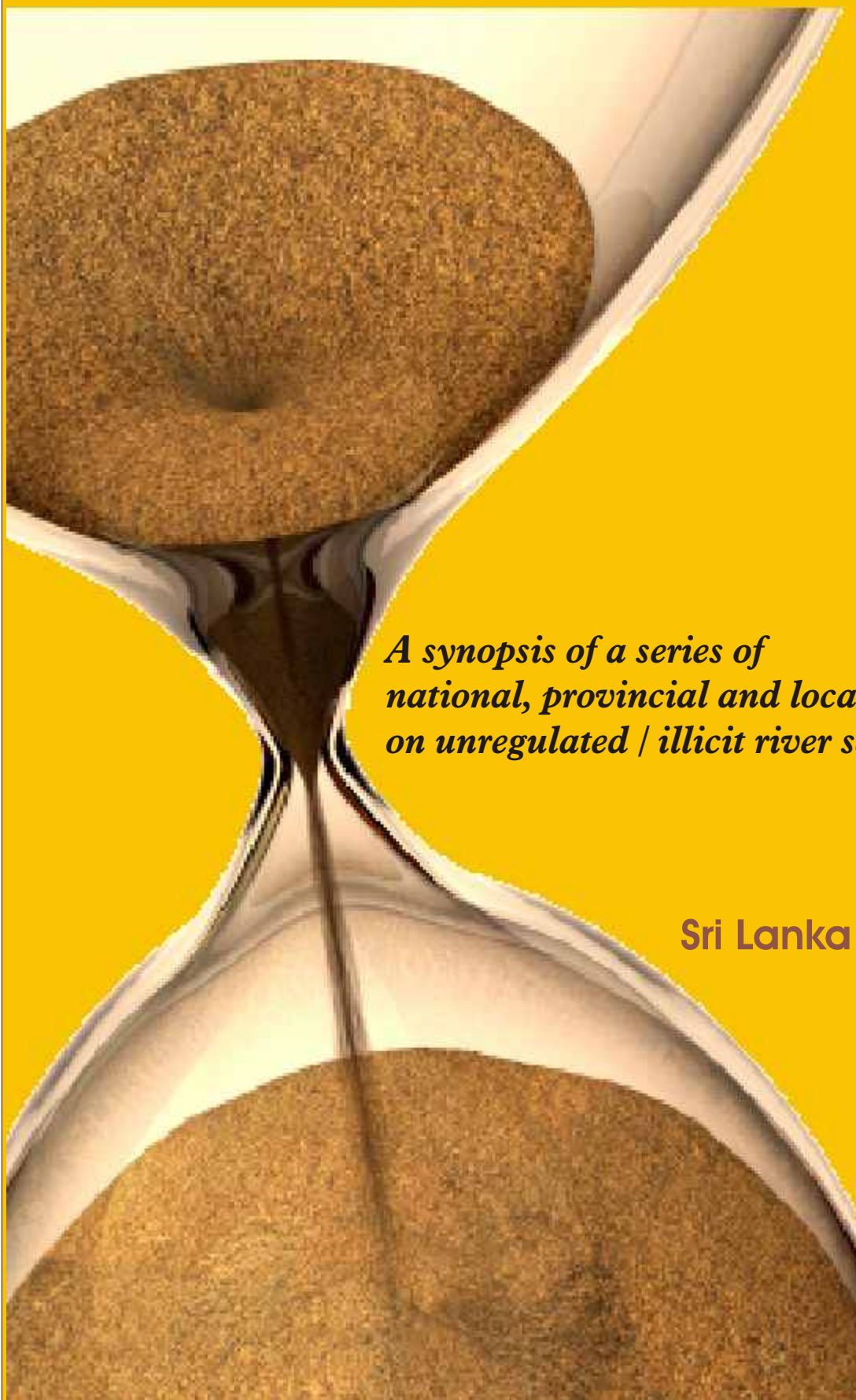
RIVER SAND MINING - BOON OR BANE?



A synopsis of a series of national, provincial and local level dialogues on unregulated / illicit river sand mining

Compiled by
Ranjith Ratnayake
Sri Lanka Water Partnership

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November 2008

River Sand Mining (Manual)

Sand Removal from River Bed

Preface

Unregulated and illicit River Sand Mining (RSM) and its consequences with the related aspect of corruption, has been an issue that has constantly come up for discussion at forums organized by the Sri Lanka Water Partnership (SLWP) on Integrated Water Resources Management (IWRM) and other water related topics, starting with a Gender and Water dialogue held in Kurunegala in 2005. Two of the Area Water Partnerships (AWP) established for Deduru Oya (Deduru Oya Surakeeme Sanvidhanaya) and the Maha Oya (Maha Oya Mithuro) have this as the priority issue, whilst three other AWP for Malwatu Oya , Upper Mahaveli and Nilwala highlight sand mining as needing urgent resolution.

The SLWP after several local discussions organized a National Dialogue on River Sand and Clay Mining on 24th April 2006 in Colombo in collaboration with the Capacity Development Network (CapNet) and the Network of Women Water Professionals (NetWwater). The Hon; Minister of Science and Technology who was Chief Guest at this workshop attended by the relevant agencies and NGO agreed to set up a Ministerial Task Force for technological alternatives to river sand to be considered . However this did not see fruition due to a perceived lack of interest by the relevant institutions due to possibly many overlaps and coordination problems and certain prevailing political issues. Nevertheless, continuing agitation by affected communities, CBO /NGO and Public Interest litigation has brought this issue to the forefront again.

The Water Integrity Network(WIN) as part of its programme support to SLWP is funding a series of awareness programmes focusing on RSM related corruption and socio-economic and environmental issues including the legal aspects for enforcement staff such as the police and of the relevant agencies. Provincial programmes held for staff of the North Western, Southern, Central and Sabaragamuwa provinces were exceedingly successful and the response from the police has been beyond expectation. Papers/Presentations at these sessions covered RSM issues related to the resource base, social, economic and environmental impacts, construction industry requirement of sand alternatives and options as well as connected legal and management issues.

This booklet aimed at a wider audience is a synopsis of the content of the papers, presentations and views articulated at the discussions that followed. It is hoped that this will enable the reader to grasp the issues involved in RSM including the underlying aspect of corruption with its far reaching implications for IWRM and ensuing environmental sustainability, helping raise public opinion to help early resolution of the issues involved.

S. B. Niyangoda.
Chair SLWP

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Chapter 1 Resource Base and Demands

1.) Water and River Systems

Tropical Sri Lanka is blessed with adequate water resources though encountering spatial and temporal shortages in some areas with a mean annual rainfall of almost 1900 mm. This occurrs through a bimodal monsoon system together with convectional and depression based rainfall types accounting for the major share. Total rainfall is approximately equivalent to a rainfall volume of 120 billion cubic meters over the country's land area. This approximates to almost 2400 cubic meters per capita at current population levels with likelihood of reducing to about 1900 cubic meters at a population threshold of 23 million expected in 2025. Therefore, while there may not be physical scarcity of water in large measure, there could be economic scarcity compounded by the major problem of water quality as a consequence of both point and non point source pollution.

The high intensity rains that often occur drain through 103 river basins of varying size with catchments varying from 9 square km to 10,327 square km. Mahaweli is Sri Lanka's longest river at 355km followed by Malwatu Oya at 164 km , Kala Oya at148 km and Kelani Ganga at 145 Km. The collective length of all the 103 rivers is estimated at 4560 km. Twenty of the 103 rivers are classified as wet zone rivers, which carry about half of the annual surface run off estimated at around 35% of total annual rainfall, with up to 50% of run off experienced by wet zone rivers. Most rivers originate from the central hill country radiating outwards like spokes of a wheel to reach the coast. However, most rivers in the North and East originate from within the two provinces and thus mostly provincial rivers. Annex 1 provides a map of the 103 River Basins.

Sri Lanka has for over 2500 years been a hydraulic civilization. Since ancient times the central hills, the source areas of our rivers have been conserved and protected assuring a reliable perennial supply of water tapped in the lower reaches for agriculture, other human needs of its people and the environment. The advent of colonial subjugation, especially during the period of British rule, saw vast extents of high and mid elevation hilly lands being opened up for plantation agriculture with coffee, tea, cocoa and rubber. Heavy erosion of the hill country resulted with the water retention capacity of the source areas and river supplies being affected on one hand with high levels of sand, silt and clay being transported downstream by these rivers with greater proneness to flooding in the lower reaches on the other.

Erosion has gradually reduced to moderate levels with the adoption of soil conservation measures in plantations and establishment of crop and shade tree canopies. However, erosion has been exacerbated by vegetable and potato cultivation in recent times in high elevation sloping land with little or no soil conservation and the gradual exploitation of timber in plantations.

Sand extraction at levels that existed helped maintain the supply demand equilibrium without affecting the river bed levels till the nineteen eighties when the construction boom under the free economy resulted in excessive and unsustainable sand mining the consequences of which we bear today. Some impact on river sand sites normally available for sand extraction was lost with the construction of reservoirs such as on the Mahaweli and other irrigation and multi purpose reservoirs. This too has contributed to overexploitation in the reduced available locations.

The river systems constitute the arteries through which the lifeblood of water reaches the various users and uses from agricultural, livelihood and rural drinking water needs to that of urban areas, cities, industries and the environment. From feeding the irrigation, hydropower and multi purpose reservoirs, to recharging ground water, to the wetlands, marshes and inland lakes supporting ecosystems.

Based on certain soil and flow characteristics in the basin and land use practices in the upper reaches, certain rivers carry large amounts of sand, silt and clay with heavy discharges occurring during the rainy season. About one third of the rivers especially those in proximity to urban centers, development projects and good road infrastructure provide river sand and clay for the construction industry. Prior to the late nineteen eighties the requirements of sand for the construction industry was such that sand extraction from the rivers were at such amounts that normal replenishments from the upstream areas helped keep river flows and bed levels at levels that were not impacting negatively on other needs and the environment. Serious issues with respect to river sand mining first arose in the Kelani River due to availability of sand in proximity to Colombo followed by increasing occurrence of negative impacts in the Maha Oya and Deduru Oya mid and downstream reaches. Currently this problem has spread to the tributaries of these rivers as well as over 35 other rivers with sand being transported from as far as 200km away from Colombo.
Issues of overexploitation have reached such proportions that for example in the case of Deduru Oya sand mining is now prohibited through intervention and order of the Supreme Court.

2.) Sand for the Construction Industry.

From a sector contributing around 5% to GDP in the nineties the construction industry now accounts for nearly 8% of GDP. The focus on infrastructure development and industrialization in the new millennium coupled with the extra demands caused by the tsunami devastation of 2004 has seen the requirement for sand increase to unprecedented levels. Sand a major component of and facilitator of infrastructure work has seen demand rise to over 7 million cubic meters annually (2005 Survey) with a demand growth projected to increase by 10% every year. Current estimates put the demand figure at

almost 10 million cubic meters for 2008. Sand is also a major constituent in dam construction, filtering systems in water supply infrastructure and manufacture of glass. The main source of sand for the industry has been river sand which at these levels of requirement cannot be met from our river systems without severe environmental consequences and impact on other livelihoods and national needs. The construction industry employs over 1.5 million persons directly or indirectly signifying the important socio economic status of the industry.

The high demand for river sand over the last three decades may be attributed to the following;

A) Demand of the construction industry and multi purpose projects.

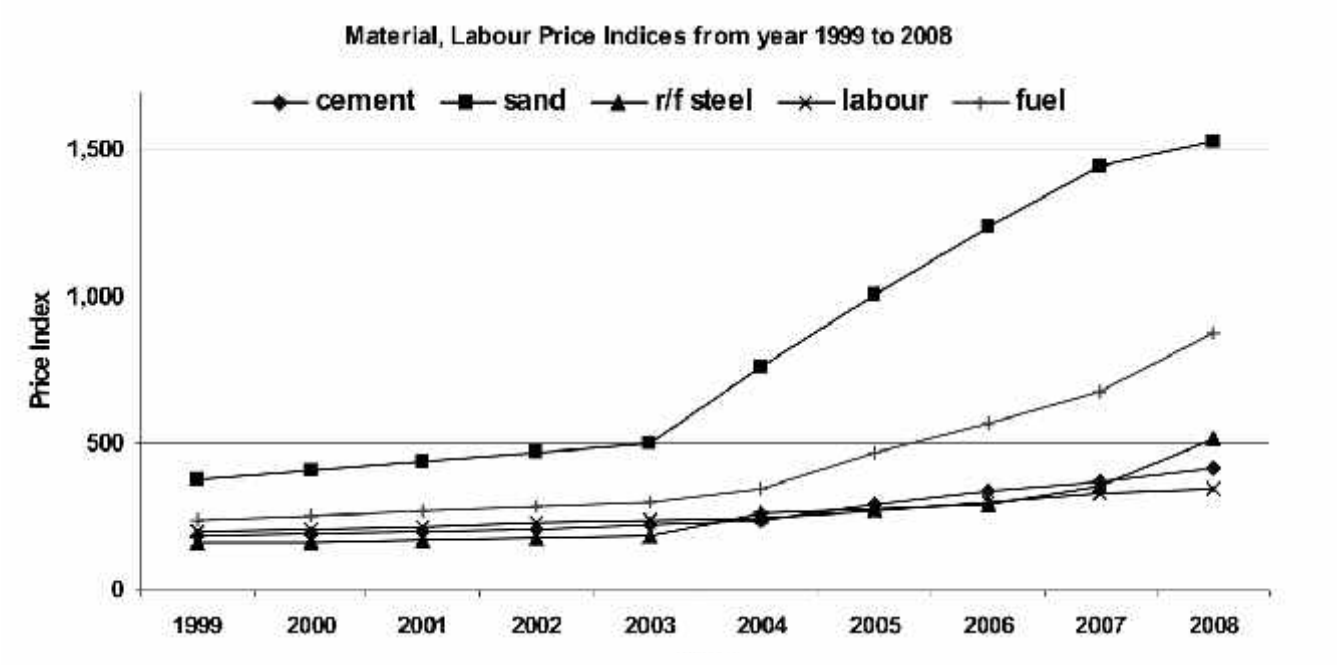
b) Demand for road construction and related infrastructure

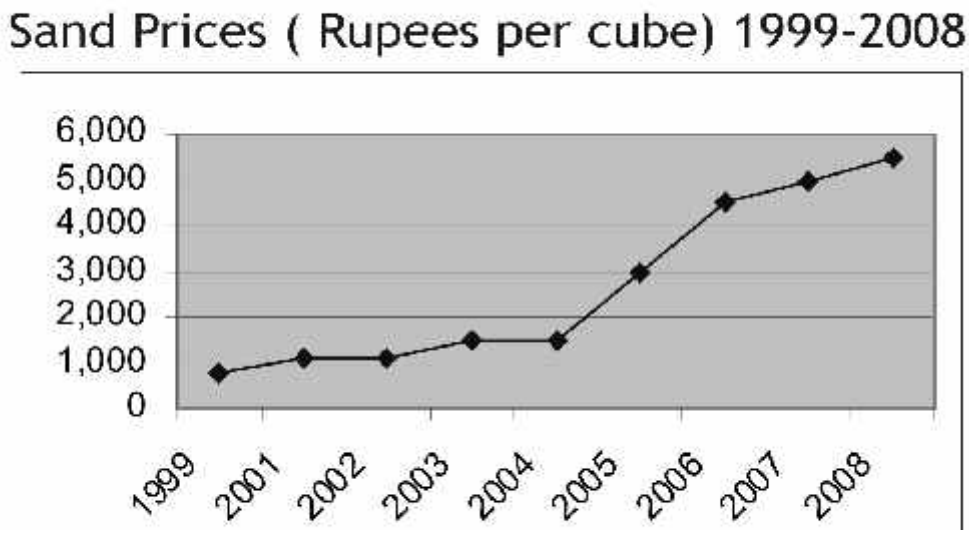
C) Housing construction changes due to lifestyles and increased living standards with urban expansion.

d) Movement in rural housing construction from traditional materials to cement based products and construction with increase in incomes and living standards.

e) Preference for multi-storey construction on small plots due to high cost of land in urban areas.

The price of sand has increased more than four fold since 2003 and at current prices the value of sand usage per year has been estimated at Rs.1400, 000,000. While price increases have been attributed to limitations in supply, distances and high cost of transport it is estimated that transaction costs relating to obtaining of licenses etc have contributed to retention of artificially high prices by sand suppliers and traders who tend to form cartels.





Chapter 2 Negative Impacts of Unregulated River Sand Mining (RSM).

Source area degradation including illicit felling and cultivation of steep slopes in the catchment areas, bank encroachment and unregulated/illicit sand and clay mining in several major rivers and banks are progressing to a national threat to our rivers, ecosystems and health of communities by affecting water flows resulting in drastic problems of water supply for livelihoods of communities during dry seasons.

Added to this poor environmental behavior of individuals and institutions through industrial, commercial waste, garbage dumping and fecal pollution is aggravating the situation through increased health hazards and need for extensive treatment of water for domestic use. In addition over exploitation through illicit sand and clay mining undermines community and national investment in infrastructure such as bridges, irrigation water supply systems and roads. It also impacts adversely on community lifestyles and livelihoods affecting agriculture, fisheries and domestic water

While negative impacts of unregulated and illicit river sand mining was observed as far back as the early nineties it was not until the mid nineties that issues were reaching disastrous proportions with exploitation reaching unsustainable levels with severe environmental consequences in rivers such as the Kelani River,Maha Oya and Deduru Oya.

The introduction of mechanized river sand mining using heavy equipment such as large back hoes and draglines saw an exponential rise in the damage to the environment, local infrastructure and community livelihoods. Mechanized sand and clay mining has now been banned under regulations enacted under the National Environment Act though illicit operations still continue though more discretely.

The issue of salt water intrusion affecting drinking water intake structures of the Kelani River due to low flows in a lowered river bed flagged the rising concern of this largely unregulated industry of river sand extraction. This followed by similar issues including lowered water tables in Deduru Oya and Maha Oya saw the concerns reaching such levels as to require immediate intervention by the authorities. By 1995 there was awareness that an environmental issue of large magnitude existed with respect to river sand mining. Annex 11, provides a map of rivers affected by sand mining as of today.

Some of the major negative impacts of unregulated and illicit river sand mining are listed below.

Some Major Negative Impacts:

a) Lowering of water tables (upto10-15 meters) reduces productivity of plantation agriculture, paddy and vegetable cultivation thus impacting on the economy affecting livelihoods.

b) Lowered water tables affect drinking water supplies especially dug wells with most running dry, requiring water to be hauled long distances by carts/bowsers for domestic needs cause increased drudgery(to women) and costs to local communities.

c) Lowered water tables have affected pumping units of NW SDB supplying water to main cities with pump stations having to incur high costs to re-establish supply capability.

c) Collapsing banks due to mining cause loss of high productive land and affect course and characteristics of river.

e) Basins close during low flow due to lowered bed in certain sections affecting fish, fishing, downstream users and wetlands, impacting on total ecosystem.

f) Lowered river beds result in salt water intrusion downstream affecting many water supply intakes for urban areas.

g) Uncovered mining pits on the river bed are mosquito breeding places during low flows and death traps to river users during normal flows.

h) Health/sanitation issues, bowel diseases etc due increased pollution levels and stagnant water.

I) Damage to local roads/culverts as heavy vehicles deviate from main routes to avoid checks.

j) Dust and noise pollution to local communities due to heavy traffic movement on unpaved local roads.

k) LIlicit operations attract high pay, resulting in school dropouts and lack of labour for agriculture compounded by issues of gambling, drugs and other vices due to easy money.

l) Community integration and value system breaks down due to opposing camps in same village.

m) Encourages other illicit activities as nexus forms between interest groups, enforcement staff and political authority.

A) Domestic Water Supplies.

The impact of unregulated and illicit sand mining has had severe consequences for riverine communities and communities accessing water through water supply schemes and through ground water wells maintained and recharged by the river systems. In some instances lowering of the river beds by excessive mining by as much as 10-15 meters resulting in lowered water tables have seriously affected drinking water supply intakes both to urban centers, community supply systems and made dug wells in an otherwise well endowed areas run dry. Communities are thus forced to secure water from the river itself or through suppliers who have now emerged resulting in much economic hardship and drudgery especially for women and children who are normally charged with securing water for their households. Health, sanitation and hygiene issues have also surfaced as a consequence. Impacts have been severe in the Kelani and even greater in the Maha Oya and Deduru Oya region.

B) Agriculture and Livelihoods.

The North Western, Western and Sabaragamuwa provinces cover agro ecological regions suited for plantation agriculture of tea, rubber and coconut. The Western and North Western Provinces constitute the coconut triangle where extensive coconut plantations exist. As a monocotyledon coconut has a comparatively shallow root system sensitive to water

table fluctuation and this crop has been a major casualty of lowered water tables which have resulted in loss of productivity and employment in plantations with major cost implications for coconut, a staple in the national diet. Coconut is also a small holder and home garden crop and thus the poor are also impacted adversely. Similar conditions prevail for tea and also rubber in sensitive areas.

The greatest impact has however been on small holder agriculture dependent farm families and households who depend on vegetable cultivation for their livelihoods. These families are now required to abandon their vocation, move to water accessible areas or develop pumping systems at high cost to continue to engage in their livelihood. Lack of water in dug wells require further investment in water supply systems such as sprinklers and drip irrigation which requires high unit cost investment outside the reach of rural farmers.

Many lift irrigation system intakes have become inoperable due lowered water tables and relocation of pump stations at high cost are now a regular feature if such systems are to be kept in use.
Collapse of river banks due to mining has not only resulted in loss of highly productive land, widening of the river, altering the water spread and change of river course have had significant adverse consequences as well.

A) Damage to Infrastructure.

The first casualty of river sand mining is the rural roads and culverts due to heavy traffic of fully laden trucks and tippers. During the rains the roads are almost unusable and culvert collapse is a common feature. Severe bank erosion occurs as these heavy vehicles are driven into the river bed for loading. During the dry season the communities not only bear the brunt of dust but also bear with the damage to buildings caused by the vibration of heavy traffic. Continuous movement of such traffic on provincial and even main roads has resulted in damage to roads and bridges affecting movement and delays of other goods and passenger traffic. Piers of major road and rail bridges such as at Deduru Oya, Maha Oya have been exposed due to removal of sand and cause a major threat to highway transport and safety. Damage to electricity pylons and transmission towers in locations close to river banks have occurred and are also a major concern.

B) Social Implications.

Illicit river sand mining offers high returns both to small scale as well as organized cartels. Communities affected by reduced income generating activities fall easy prey to illicit mining groups which inveigle locals through high labour returns to participate in this remunerative activity. Even school children are attracted to work for these groups and invariably become dropouts who with the easy money and lack of direction easily take up to drugs, gambling and other vices generally promoted to ensure a captive work force. A nexus quickly forms with other groups indulging in illicit activities such as illicit liquor resulting in these groups becoming opinion makers in an otherwise docile, law abiding community. Political patronage to these groups as a way of pay back for services rendered to politicians during election time ensures a safety net for uninterrupted operation with sometimes token action by enforcement staff invariably in the loop or inhibited by consequences to be faced by being too vigilant. It is observed that such groups as a next step enter the political arena or recognized service institutions and networks themselves to secure social acceptability and to continue unhindered. Gradual separation of the village communities into various camps invariably follow.

High levels of corruption are noted in such situations with operators forming linkages to politicians and officials including enforcement staff resulting in difficulty in apprehending and stopping illicit operations as prior information on raids find its way to these operators through conniving staff.
Duty conscious staff find themselves isolated and without support in many instances. There are many occasions where bodily harm of grievous nature has been inflicted by organized operators on enforcement staff including the police even at rank of inspector. Civic leaders, members of CBO/NGO and reporters too find themselves constantly in the way of bodily harm especially where illicit operations are pursued aggressively and highlighted in the local and national media forcing the authorities to act.

Chapter 3 Governance

1) Administration, Institutional and Legal Basis.

The management of natural resources including river resources in ancient times has been on the basis of edicts issued by kings and customary rules and traditions of the communities. Since colonial times they have been managed through provisions of the various legislations pertaining to the use and management of such resources executed through direct or delegated arrangements. The management and protection of river resources have been subsumed within the respective legislations though specific river sand and clay mining activities are covered under the provisions of the Mines and Minerals Act and the National Environment Act.

Water resources use and management are intrinsically tied to that that of land and its use and therefore the protection of this resource are affected by activities in sectors such as land/forestry/mining/fisheries etc. The Amendments to the Soil Conservation Act in 1996 and Mines & Minerals Act 1992 have supportively reinforced protection of water resources. Amendments to the Irrigation Ordinance in 1994 and Water Resources Board Act in 2000 have reinforced participatory management and monitoring aspects. A Draft National Policy on Sand by the Ministry of Environment and Natural Resources for the Construction Industry currently under discussion if implemented will ensure further protection of water resources.

The main legal enactments affecting water resources are:

State Lands Ordinance
Municipal/Urban Councils Ordinance
Irrigation Ordinance
Water Development Law
Mahaweli Authority Act
Land Acquisition Act
Agrarian Development Act
Soil Conservation Act
Water Resources Board Act
Mines & Minerals Act
Water Supply and Drainage Law
Electricity Act
13th Amendment to the Constitution
Fauna and Flora Protection Ordinance
Land Development Ordinance
Forest Ordinance
Fisheries & Aquatic Resources Act
Pradeshiya Sabha Act
National Environment Act
Coast Conservation Act

While land boundaries constitute the main delimitation lines with respect to management of water resources and there being no organisation or authority to manage rivers in Sri Lanka and with over 50 legal enactments and 40 agencies at various levels involved in water resource sector management activities the outcome has been a scenario of confusion, duplication and inaction providing an environment where corruption and political patronage/interference dominate sector activities. The magnitudes of the issues are thus exacerbated.

The State Lands Ordinance confers on the state the management and control of the foreshore and water in public lakes and rivers subject to riparian rights excluding rights to minerals and the bed of any stream which is the property of the state. Water can only be diverted or construction on a bank undertaken with a permit issued by the state.

The Irrigation Ordinance and the Land Development Ordinance together with the Mahaweli Authority Act for its specific area of authority further complement and reinforce administration and management of these resources.

While the above legislation which may be considered development oriented legislation was followed by special conservation/protection oriented legislation such as the Forest Ordinance, National Environment Act and the Coast Conservation Act where certain behavior with respect to use of natural resources were dealt with through specific guidelines and requirements.

The Mines and Minerals Act No 33 of 1992 established the Geological Survey and Mines Bureau (GSMB) to regulate the exploration for and mining of minerals as well as transport, processing, trading and export.

The passing of this legislation and consequent establishment of the GSMB has had far reaching consequences both positive and negative. River sand removal which was invariably a matter for local decision making through the district administration system that the state normally used for its administration, development and regulation was now brought under central control of the GSMB. On one hand this provided an opportunity to avoid ad hoc locally focused exploitation in most cases affecting the river and ecosystems outside the ambit of the local administration enabling an integrated holistic view of the resources based on national needs to be undertaken and reduced a sphere of undue influence that may prevail at the local level in decision making brought about by political imperatives etc.
On the other hand while providing for some local input by way of recommendations the decision making process was centralized in the GSMB.

This in some way reduced the accountability perception of the local administration vis a vis the issue of sand and placed the entire national licensing and approval system at the headquarters of the GSMB far removed from the source. Established in 1993 with a small core staff it was inconceivable that proper monitoring and regulation of licenses and extraction was practical or possible from its head quarters. The lack of provision to delegate to the district/divisional administration its powers of execution as in most

legislation perhaps for good reason saw both the advantages and disadvantages of centralized control emerge. Rampant illicit mining including mechanized sand and clay mining continued till banned recently due to this monitoring and regulatory lacuna. Allegations of mal practice and corruption in processes and procedures followed. By way of response the GSMB established two regional offices and is in the process of establishing 10 stand alone offices to monitor and follow up. While this will help strengthen its monitoring and regulating capacity it is not likely at that level for these offices to be immune from the local dynamics of sand supply in a sellers market especially without the degree of insulation that would be available if the offices were to be integrated with the larger hierarchical oversight with checks and balances provided by the district/provincial administration. Also stand alone offices are more vulnerable to attack seen in Polonnaruwa where the office and staff of the local GSMB office was attacked by a group of sand miners.

The legal basis and centralization of the decision making has also brought tremendous hardship to small scale users of river sand for individual purposes, such as a villager requiring a cube or two of sand available from a local stream for personal use. Legitimate small users thus have to resort to illicit extraction and transport to resolve essentially a legitimate requirement whose transaction costs would be prohibitive if licensing and authorization procedures were to be followed. Thus a focus on the construction industry without consideration to operationalisation of the policy for small scale users is a major shortcoming in the conceptualization, adoption and enforcement of the law.

Meanwhile, the Central Environment Authority acting under the provisions of the National Environment Act of 1980 through promulgation of Regulation 1 of 7th July 2006 took steps to ban use of certain equipment for sand and gem mining from water bodies and river banks. This has effectively reduced instances of mechanized sand mining though some illicit operations do continue on a sporadic basis.
A Sand Charter (National Policy on Sand for the Construction Industry) by the Ministry of Environment and Natural Resources outlining guidelines on use of sand for construction purposes was presented for public comment in March 2005 and is awaiting finalization.

The Coast Conservation Act provides the authority and mandate to the Coast Conservation Department (CCD) which is charged with the management, monitoring, resource allocation, regulation and conservation of coastal areas. The area of authority of the CCD extends upstream up to 2 km of the river systems from the coast, issuance of licenses for sea sand and river sand within this area is a function of the CCD.

2) Public Interest Litigation.

A high degree of community awareness and public mobilization in communities whose livelihoods were affected in the face of massive unsustainable river sand mining by powerful groups most with political patronage compounded by a perceived lack of action by the authorities saw these communities through organized community groups with support from environmental non governmental organizations seeking legal redress as a last resort. A landmark case undertaken by the Green Movement of Sri Lanka (GMSL) and the Centre for Environmental Justice (CEJ) together with stakeholders of the lower Deduru Oya in appeal to the Supreme Court (Case No FR 81/2004)saw far reaching specific guidelines being issued by the Supreme Court with respect to sand and clay mining. In another case filed by leaders of 3 Community Organizations also from Deduru Oya ,(SC no. FR.226/06) saw the court banning the further extraction and removal of sand from both the Deduru Oya and recently including in Maha Oya. It also required that a report be presented to court every 2 months. This highlights the view that the regular administrative mechanisms are unable to meet the emerging challenges and it was left to the legal system to provide relief and ensure compliance.

3) Community Awareness and Mobilization against Unregulated/Illicit RSM.

The main thrust of opposition to illicit RSM has come from environmentalists, community groups whose livelihoods are affected and local champions especially religious leaders who have come forward in the face of a well organized and politically patronized sand mafia. By and large the authorities have been slow to respond, sometimes overwhelmed by the political imperatives that govern this highly profitable venture.
Success of joint action by interest groups reinforced by recent decisions of the Supreme Court has generated greater public willingness to counter this menace and insist on action by the relevant enforcement and regulatory staff. The increasing concern with pollution in general and water pollution and its consequences in particular with the active promotion of Integrated Water Resources Management (IWRM) as a concept consequent to Rio/Dublin Conferences of 1992 followed.

These were reinforced by initiatives such as by the Sri Lanka Water Partnership (SLWP) which has been promoting IWRM in Sri Lanka since 1999 through its Area Water Partnerships (AWP) and work of the Network of Women Professionals (NetWwater) has resulted in much community awareness of issues in the water sector while concomitant capacity building efforts have helped surface local leaders willing to lead and sponsor environmental issues in a more committed manner.

The role of the community organizations such as the Area Water Partnerships (AWP) which provide a forum for local level interaction among agency officials, local authorities and the community have been appreciated and in some instances their representation have been accommodated in National Task Forces such as the Cabinet appointed Task Force set up for the Kelani and Maha Oya Rivers.

The degree of impact and sustainability of community interest on issues till resolution are dependent to a large extent on the local leadership available. In most instances the continued pressure being mounted by CBO have been where local champions either charismatic village or religious leaders have mobilized and enthused the community to resolve issues through negotiation or recourse to law as a last resort without succumbing to the political and other pressures that are invariably brought to bear by organized groups in the sand business.. The temple and the chief priest has in most instances been the rallying point providing leadership where communities have been able to withstand and overcome pressures of these organized groups involved in illicit river sand mining. Another factor that reinforced the community activity in this regard was the joint supportive action organized by NetWwater which helped bring the Southern Province RSM Action Committee organized under the Nilwala AWP to work with the Deduru Oya AWP at a meeting in Bingiriya Raja Maha Viharaya resulting in a synergy and strong links being forged on common issues with a common strategy to be followed.

Chapter 4 Options and Issues

1) Sand Alternatives/Options

With the general acceptance that the 10 million cubic meters of sand required annually cannot be met from river sources alone without severe environmental consequences considerable investigation has been carried out on alternatives to and options in construction where sand requirements are reduced.

Some recommended alternatives;

a) Manufactured sand (crushed stone/quarry dust).

b) Offshore sand (sand pumped from the sea and stored for rains to leach the salt)

c) Dune Sand (Hambantota-Panama, Puttlam-Kalpitiya, Mannar)

d) Fly Ash (partial replacement)

e) Granulated waste (plastics, glass and fiberglass)

Some options in house construction ;

a) Rammed Earth Construction.
b) Compacted Earth Block.
c) Partition Board.

Manufactured sand is now gradually finding favour especially in road work while offshore sand is now being made available by the Land Reclamation and Development Corporation and 4 other large scale private contractors/ suppliers at prices around 25% cheaper than river sand. The major issue lies in the large investment needed in capital equipment and the timelines till the sand can be issued as suitable for construction in addition a high license fee also charged by the National Aquatic Resources Authority (NARA) appears to be a disincentive to potential investors as high prices charged to recover costs could prove uncompetitive.

Dune sand offers many possibilities but the environmental costs have to be carefully evaluated while some socio political issues could arise from large scale removal from province especially in the North and East. A major factor in both the above is not the issue of licenses but the monitoring and regulation to ensure compliance with the issued guidelines.

With respect to alternative methods of construction while some head way has been made by interested construction firms, research institutions and NGO in popularizing these methods especially for low cost housing ,inadequate information on durability of structures and a wide awareness programme with especially state sponsorship has not been yet forthcoming.

The lack of large scale adoption of the alternatives and options appear to be conditioned by a lack of standards/specifications that would need to be followed especially for large scale or public investment. It is imperative that the state takes on the responsibility of such promotions along with the construction industry in the preparation and adoption of proper standards for use of these alternatives and options especially quality control and safety. Greater collaboration among institutions such as the National Building Research Organisation (NBRO), Centre for Housing Planning and Building, ICTAD, RDA etc with involvement of the relevant Ministries such as Science and Technology, Disaster Management, Housing and Construction, Irrigation etc working through a task force arrangement for the necessary policy and standards formulation appears essential

2) Issues/Responses

There appear to be some major issues needing addressing to ensure that river sand continues to support the requirements of the construction industry without adverse impact on the environment and livelihoods both of those dependent on sand mining and others. That the systems of licensing, administering and enforcement are efficient, effective and least inconvenient. That options and alternatives are practicable, cost effective and safe.

a) While the need and role of the GSMB is well established there appears to be difficulties of enforcement and public/community disenchantment of service with what is essentially a centralized system. It appears rational logical for a small technical and planning based institution to have worked through the existing state machinery at District/Divisional level that prevailed prior to setting up the GSMB for regulation and enforcement rather than setting up its own independent regional structure which inadequate at two till recently and now to be expanded to 10. Branch offices will definitely add to transaction costs all round and without the administrative oversight of a spread hierarchy at appropriate level that is provided by subsuming activities within the existing District/Divisional Secretariats that most other licensing agencies use through delegation of power can provide greater opportunities for corruption and misuse to prevail in what is an sub office with supervision from headquarters. Adding of a suggested Flying Squad also typifies the general tendency of state institutions for empire building.
Experience has shown that having external transferable supervision staff can inhibit corruption to a greater extent than would be possible with a lower level of supervision and accountability in an out posted office mostly remote controlled from head quarters. It is inexplicable why the use of Divisional Secretaries and their staff who were earlier entrusted with the aspect of approvals with regard to river sand have only a peripheral role in associated recommendations as of now. Greater interaction and accountability that such staff has with the local community would have been used to greater advantage and less cost if the system of delegated power was practiced with the required technical input at appropriate level being integrated with these offices.

Mechanized Sand Mining (Coastal)

Sand Dunes

Offshore Mining

Rammed Earth Construction

Pre-cast Soil Block Columns

B) As is currently practiced the process of licensing has little local administrative authority and community input. A system of recommendations exist but not accountability resulting in many community conflicts that would have not occurred as to selection of sites and estimation of sand extraction potential etc that now need police intervention and even recourse to law as far as the Supreme Court which is unnecessary and costly both in terms of money and time and also reflects badly on the systems in place. A highly centralized system not only adds to transaction costs passed on to the consumer but becomes a bottleneck, avenue for malpractice and corruption and cause of public disenchantment.

c) As provision currently stands individual users in remote areas who need small quantities of sand available for extraction from local streams for personal use and whose requests were processed at the local level have no option but to extract and transport these quantities illicitly with the real likelihood of prosecution? This facility of approval was earlier available at the Divisional level.

d) As a practical step in popularizing sand alternatives and construction options, specifications and standards need to be established to ensure conformity and consistency and for quality control. The lead role needs to be played by the state and institutions such as ICTAD and NBRO in ensuing that certain construction items be required to use approved specified materials as alternatives. It is only then that the general public will be encouraged to follow suit and adopt such practices.

e) A major weakness in regulation of river sand mining appears to be that preventive monitoring is not practiced, from prior to issue of licenses after careful examination of suitability of sites and potential, to on going monitoring and regulation of operations during mining.
Using the services of the police mostly to check illicit transport after the fact, places an extra burden on the police with little related responsibility on the prevention side with possibilities of corruption as observed.
Close involvement of the local community through established CBO and the local administration in these processes would reduce the significant number of malpractices both in authorized and unauthorized illicit mining.

f) Most large scale and organized illicit mining operations are found to have some degree of political patronage or official sanction enabling these groups to operate freely. Often a nexus forms with other anti social activities reinforcing mutual operations culminating in some operators seeking community acceptance by seeking entry into service and political organizations. In such instances even strong CBO are inhibited from furthering the public cause. This has been offset to some degree where strong civic leadership exists or the local religious leaders take issue. Energizing the community through awareness by NGO/CBO from outside and having the relevant local CBO link up with other CBO from other areas or basins as happened in Bingiriya where NetWwater and SLWP helped set up linkages with the Nilwala RSM bringing together a larger lobby to give voice and receive redress from the authorities.issue. Energizing the community through awareness by NGO/CBO from outside and having the relevant local CBO link up with other CBO from other areas or basins as happened in Bingiriya where NetWwater and SLWP helped set up linkages with the Nilwala RSM bringing together a larger lobby to give voice and receive redress from the authorities.

G) The National Water Supply and Drainage Board (NWSDB) is the main state institution whose services to both urban and rural areas are directly and adversely impacted by unregulated sand mining, requiring it to take very expensive mitigatory and corrective measures to maintain supplies qualitatively and quantitatively. Working in tandem with concerned NGO/CBO at national and local level through supportive common awareness programmes could be of mutual benefit.

h) The media is a formidable ally in the fight against corrupt practices in the water sector and illicit RSM. Efforts need to be made to create greater awareness in media personnel on issues involved on a regular basis with dialogues and media tours to enable gathering of first hand information and keeping the subject alive till authorities act. The electronic media and comparative ease with which web sites (BLOGS) are created enable local interest groups to highlight malpractices in real time and use the effective strategy of naming and shaming to greater effect. Partnerships between affected agencies such as the NWSDB and such CBO/NGO may be used to good effect in these circumstances.

References

1) Proceedings of National Dialogue on River Sand and Clay Mining- April 2006.

a) Resource base and sustainable resource use options and alternatives to meet demands Paper and Presentation - Dr PBR Dissanayake and Prof. Athula Senaratne, University of Peradeniya.

b) Economic aspects with impacts on environment, employment and livelihoods Paper and presentation - Prof. Malik Ranasinghe, University of Moratuwa.

c) Policy, Regulatory and Institutional Framework and its ability to ensure effective M&E. Paper and Presentation- Mr Anil Peiris, Deputy Director, Geological Survey and Mines Bureau.

3) Awareness Programmes for Enforcement Staff on Negative Impacts of Unregulated / Illicit RSM. August,September, November 2008.

a) Sand for the Construction Industry, Paper by-Mr HD Chandrasena and Ms IH Hettiarachi. Cost Consultancy Services (Pvt) Ltd.
Presentations by Mr Missaka Hettiarachi, Research Fellow, University of Moratuwa.
Ms Badra Kamaladasa, Deputy Director Irrigation Department.

b) Social ,Economic Environmental impacts and Corrupt practices related to RSM
Paper and presentation by Mr Chandana Seniviratne, Advisor,Coast Conservation Foundation,
Ms Kusum Athukorala , Chair Net Water.

c) Policy Laws and Regulations Covering River Related Resources. Paper by Ms Ruana Rajepakse, Attorney at Law, LLB. London. Barrister of the Inner Temple.
Presentation by Mr SB Niyangoda, Chair SLWP.
Presentation on Role of GSMB by Mr. Anil Peiris, Dep. Director GSMB.

d) Status and Utilization of Water Resources and Impacts of Illicit RSM.Paper by Mr Ranjith Ratnayake Coordinator/Consultant SLWP.
Presentations by Dr Champa Navaratne ,Senior Lecturer, University of Ruhuna and
Mr Sunil Jayaweera Senior Scientist, National Building Research Organization.

4) Shifting Sands of Sri Lanka, Mobilizing and Networking for Collective Action by RSM Affected Communities.
Paper and Presentation by Ms Kusum Atukorale and
Dr Champa Navaratne at the 12th Biennial Conference of the International Association for the Study of Commons, UK.

5) Evaluation Report on Maha Oya AWP and thesis research findings.
Mrs WBM Thoradeniya, Snr. Lecturer,University of Moratuwa.

Annex 1
River Basins of Sri Lanka

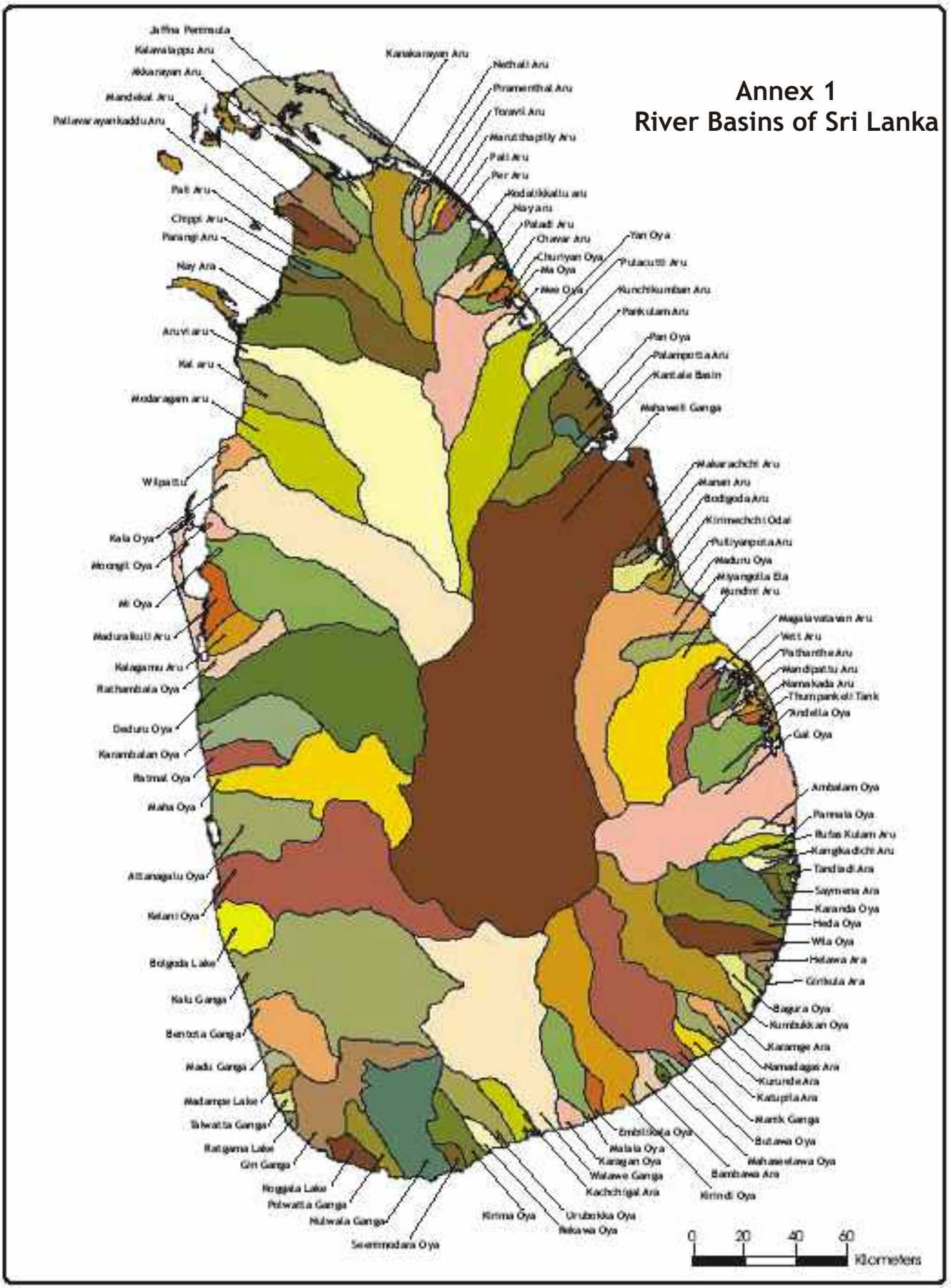


Figure 2. River basins of Sri Lanka
Prepared by U.R. Ratnayake (Irrigation Department and Survey Department base data)

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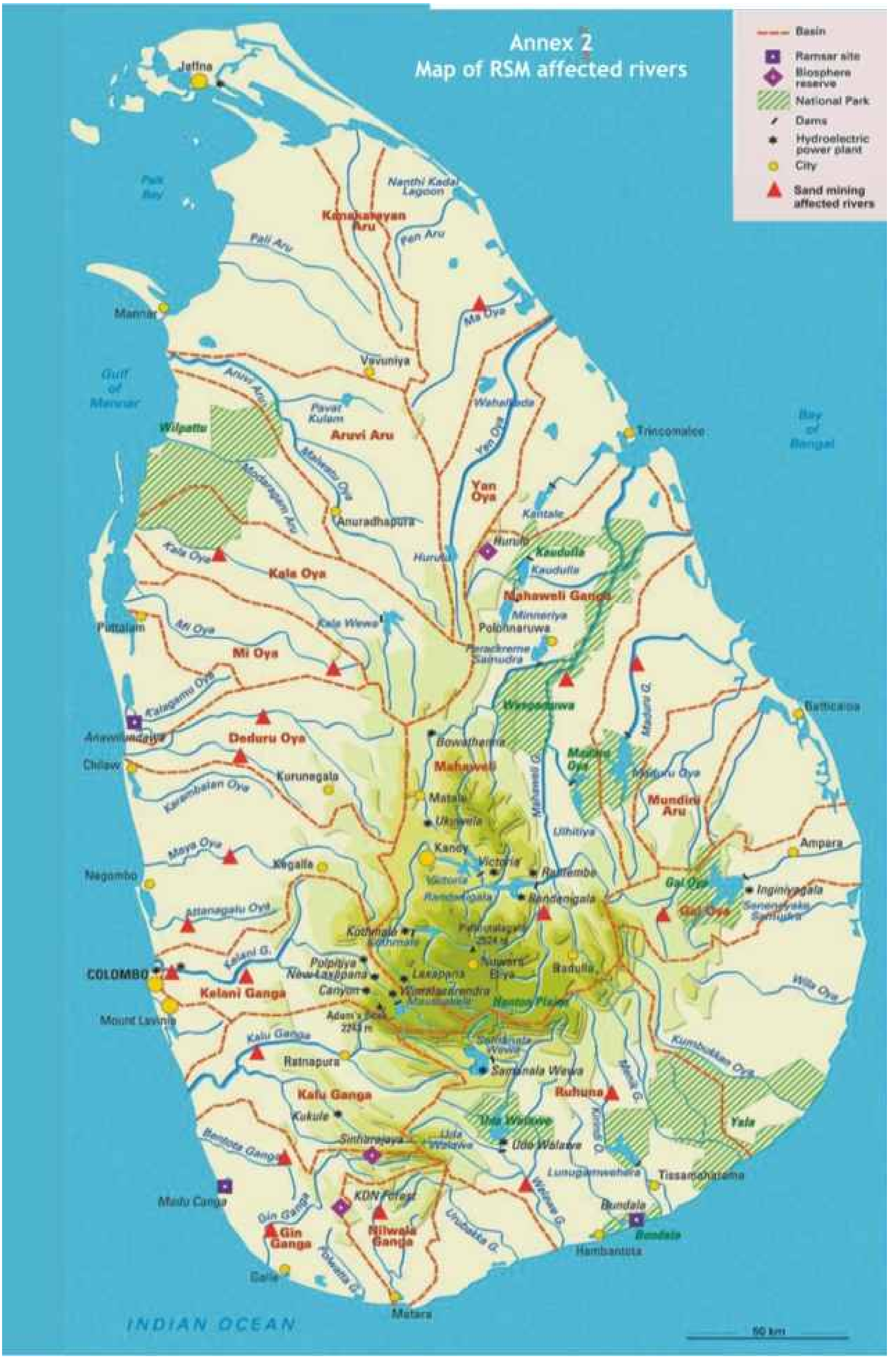
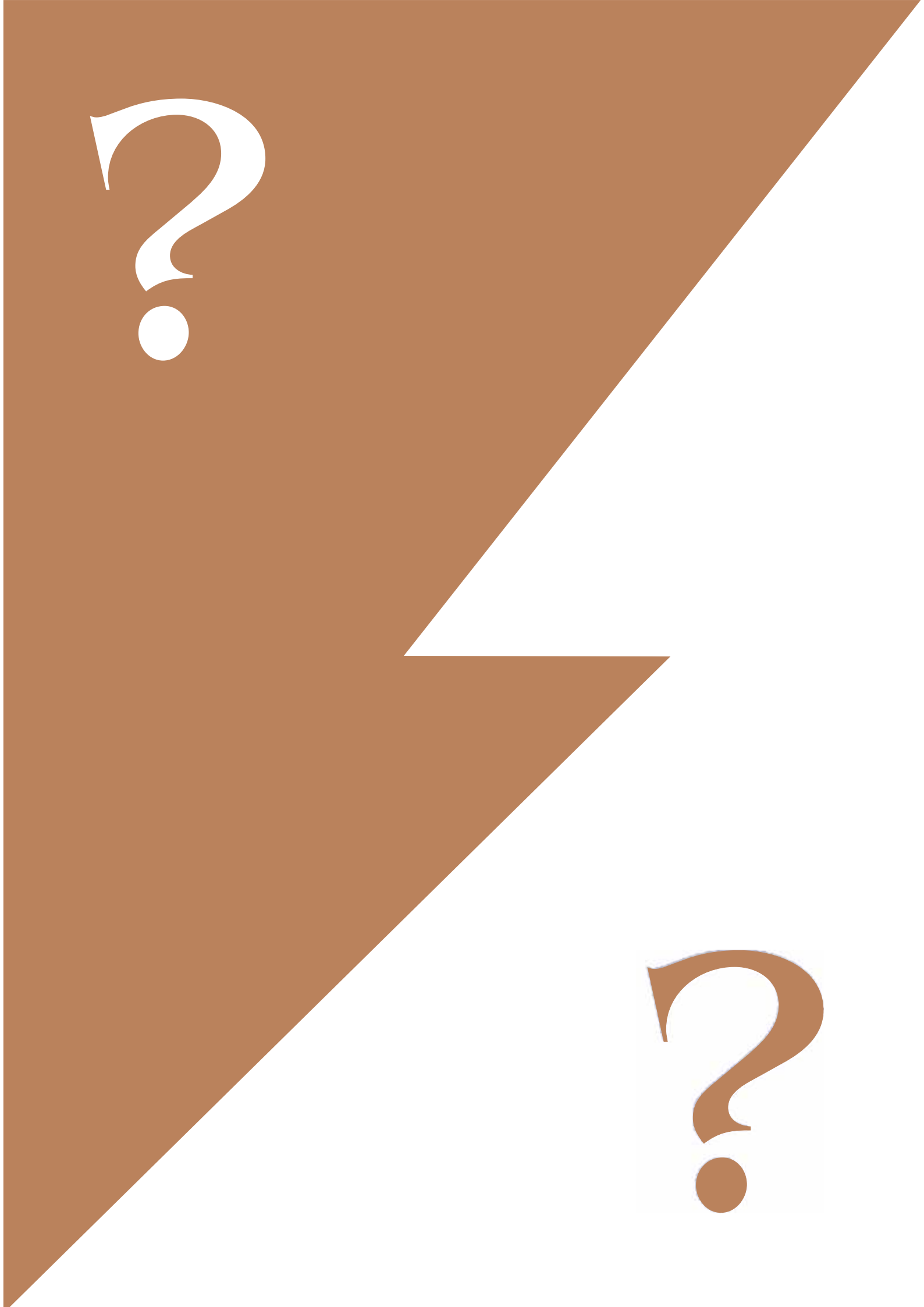

Annex 2
Map of RSM affected rivers
Basin
Ramsar site
Biosphere reserve
National Park
Dams
Hydroelectric power plant
City
Sand mining affected rivers
Jaffna
Palk Bay
Nanthi Kadal Lagoon
Kanakarayan Aru
Pali Aru
Pan Aru
Mannar
Ma Oya
Vavuniya
Gulf of Mannar
Aruvi Aru
Pavat Kulam
Wilpattu
Trincomalee
Bay of Bengal
Yan Oya
Anuradhapura
Kantale
Kala Oya
Kaudulla
Mahaweli Ganga
Minneriya
Polonnaruwa
Puttalam
Mi Oya
Kala Wewa
Batticaloa
Deduru Oya
Chilaw
Kurunegala
Bowatenna
Mahaweli
Matale
Mundini Aru
Ukuwela
Ulhitiya
Maya Oya
Kandy
Victoria
Randenigala
Ampara
Negombo
Kegalla
Gal Oya
Inginiyagala
Attanagalu Oya
Kelani G.
COLOMBO
Kelani Ganga
Badulla
Nuwara Eliya
Mount Lavinia
Kalu Ganga
Ratnapura
Samanala Wewa
Ruhuna
Kumbukkan Oya
Wila Oya
Kukule
Uda Walawe
Yala
Bentota Ganga
Sinharajaya
Madu Ganga
Tissamaharama
KDN Forest
Bundala
Gin Ganga
Nilwala Ganga
Hambantota
Galle
Matara
INDIAN OCEAN
50 km



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லங்கா ஜலனி
Lanka Jalani

Sri Lanka Water Partnership

Promoting Integrated Water Resources Management (IWRM)