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Item No. 7(c) on the agenda : International Interests in Mobile Equipment: Preparation of an additional Protocol to the Cape Town Convention on Matters specific to Agricultural, Construction and Mining equipment

(memorandum prepared by the Secretariat)

Summary	*The document reports on the research conducted until February 2006 in preparation for the proposed protocol to the 2001 Cape Town Convention on International Interests in Mobile Equipment on agricultural, construction and mining equipment*
Action to be taken	*(1) Determine priority status;* *(2) Cf. paragraph 30*
Related documents	*C.D. (85) 7(a) - C.D. (85) 7(b)*

DISCUSSION LEADING PARAMETERS AS PROPOSED BY THE SECRETARIAT

Priority	☐ high	☐ medium	☐ low	■ to be determined

I. Strategic Plan
Yes, because of (1) UNIDROIT's unique position to carry out work on specific areas of secured transactions (cf. Strategic Objective No. 1) and (2) its potential benefits for developing countries and economies in transition (cf. Strategic Objective No. 7)

II. Work Programme 2006 - 2008
On condition that (1) preliminary research confirms desirability and (2) work on one of the two protocols under preparation has been concluded

Staffing implications	To conduct further preliminary research: 0.4 Research Officer

Budget implications	If only in-house research, none. If assistance from other inter-governmental organisations (e.g. FAO, the World Bank Group, OECD) not sufficient and research to be outsourced and paid for, supplementary contributions or regular budgetary provision in 2007 *et seq*. required

BACKGROUND – PRELIMINARY REPORT

1. At its 84th session, the Governing Council decided to include in the 2006 – 2008 Work Programme of the Institute the preparation of a fourth protocol to the *2001 Cape Town Convention on International Interests in Mobile Equipment.* This fourth protocol should cover agricultural, construction and mining equipment. Preliminary research conducted by the Secretariat has evidenced a number of areas that would require in-depth study before the Institute launches into this new venture. This document considers first, a few general points, and thereafter a number of questions for each type of equipment.

A. *GENERAL POINTS*

2. The *Introduction* to the *Official Commentary* to the Cape Town Convention states that "[t]he Convention is designed to establish an international legal regime for the creation, enforcement, registration and priority of security interests and interests held by chargees, conditional sellers and lessors in three categories of high-value, uniquely identifiable mobile equipment, namely (a) airframes, aircraft engines and helicopters (which for brevity will be collectively referred to as aircraft objects), (b) railway rolling stock, and (c) space assets. The Convention is not itself equipment-specific and for each of the three categories of object it applies only through separate Protocols".[1] The principal objective of the Convention is, in the words of the Official Commentary, "the efficient financing of mobile equipment. […] The Convention system is designed to bring significant economic benefits to countries at all stages of economic development, and in particular to developing countries by bringing within their reach commercial finance for mobile equipment that has previously been unavailable or available only at relatively high cost. A sound, internationally adopted legal regime for security, title-retention and leasing interests will encourage the provision of finance and reduce its cost".[2] The possibility of extending the Convention to apply also to other types of equipment, including ships and oil rigs, has been on the table from the beginning.

3. The reasons agricultural, construction and mining equipment were proposed for a fourth protocol are two-fold: most importantly, the possibility given to those engaged in agriculture, construction and mining, especially in the developing world, to acquire equipment they would otherwise not be able to acquire and thus to permit them to optimise their activity, and secondly, the desire of producers of equipment to export to markets that without such a protocol would remain closed to them.

4. It should be observed that to date, it has not proved possible to retrieve statistics on trade in equipment for the agricultural, construction and mining industries, on what countries the equipment is exported from (but the Czech Republic, France, Germany, Italy, Japan, the Russian Federation, Sweden, the United Kingdom, and the United States would appear to be among them), on which countries the equipment is imported into. Occasionally single countries may

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1 R. Goode, *Convention on International Interests in Mobile Equipment and Protocol thereto on Matters Specific to Aircraft Equipment: Official Commentary*, Rome, 2002, 2. Paragraph 3 of the Introduction.

2 R. Goode, *Op.cit*., 5. Paragraph 8 of the Comments to Part II.

make statistics on exports available,[3] but there are no global statistics. It is therefore difficult to assess the amounts involved.

5. A preliminary point to be examined is the extent to which agricultural, construction and mining equipment qualify for application of the Convention, the very title of which specifies that it is to apply to *international* interests in *mobile* equipment (italics added).

6. In fact, the Convention does not specify any requirements of mobility or internationality. As indicated in the *Officially Commentary*,

> *"1. The requirements of mobility and internationality are considered inherent in the nature of the equipment covered by the Convention and are not specifically stated. This allows the possibility of the Convention applying to a transaction which is purely internal in that all the parties and the object itself are situated in the same Contracting State at the time of conclusion of the contract (see Article 1(n)). Such a situation will not occur as regards objects in space, and is unlikely to occur in the case of aircraft objects but could arise as regards railway rolling stock. The practical problem is that a transaction which is internal when the agreement is made may become international the next day as the result of movement of the object from one country to another. Moreover, the creditor may have no means of knowing whether or not this has occurred. Further, a transaction which is international can derive from one which is internal, as where a leasing agreement is domestic but the lessee grants a sub-lease to a party in another Contracting State. Hence the Convention takes a practical approach in covering all transactions within Article 2 even if in some cases this catches internal transactions. […]"*[4]

7. Thus, although originally the idea was to cover only equipment which moved from one country to another in the course of its operation - the equipment the Convention refers to being the equipment listed in Article 2(3) (airframes, aircraft engines, helicopters, railway rolling stock and space assets) – the possibility of adopting additional protocols covering other types of equipment is left open. Indeed, Article 51(1) of the Convention specifically states that "[t]he Depositary may create working groups […] to assess the feasibility of extending the application of this Convention, through one or more Protocols, to objects of any category of high-value mobile equipment, other than a category referred to in Article 2(3), each member of which is uniquely identifiable, associated rights relating to such objects". Agricultural, construction and mining equipment would therefore be capable of being covered by the Cape Town Convention system. Considering that such high-value equipment would often be bought in a country different from the one in which it is intended to be operated, an element of internationality can in such cases be considered to exist, in that an international contract of sale under retention of title or an international lease or other secured transaction will be entered into and the equipment transported from one country to another.

8. For each type of equipment it is necessary to determine the equipment the protocol should cover.[5] If the characteristic of the equipment being movable is no longer strict, then the fact that it should be high-value is perhaps the main characteristic still to be required. The question then is what equipment is high-value and who is likely to need such equipment. High-value

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[3] See Energy Industries Team, International Trade Administration, *U.S. Export / Import Statistics Mining Machinery and Equipment* available at www.ita.doc.gov/td/energy/mine_equip_exports.htm.

[4] R. Goode, *Op cit.*, 154. Comment 1 to Article 50 of the Convention.

[5] Lists of equipment are found in the appendices to this document: agricultural equipment in Appendix I, construction equipment in Appendix II and mining equipment in Appendix III. The Secretariat has as yet no information on the value of the items listed, and is therefore not in a position to prepare even an indicative list of the categories of equipment that should be covered by a protocol.

equipment is likely to be sophisticated, technologically or electronically, and in some instances large or intended to cover large distances or areas. When agriculture is considered, all three categories of equipment are likely to be found, although different types of agriculture will require different types of equipment: large holdings will for instance require large equipment, small holdings small equipment. As is indicated below, the size of the average holding differs markedly from country to country, as consequently does the type of equipment needed in the different countries. In the case of construction, the equipment necessary to construct a bridge or motorway is different from that required for the building of the house of a family, and the mining for coal to be used by the community as fuel requires equipment different from that required for mining in a small mine.

9. One observation that forcibly presents itself when the possibility of a protocol for agricultural, mining and construction equipment is considered, is the importance of its environmental impact. Clearly, this is for the individual States to assess, but the fact that in the case of agriculture and mining ultimately what are considered are natural resources, and that these are not always renewable, is an element in the equation. The fact that policies adopted by States aiming at the effective management, or preservation, of natural resources will influence the capability of the prospective users of the equipment to plan for the acquisition of high-value equipment should be taken into consideration. The labour market structure should also be considered. In many developing countries the industries here under consideration tend to be labour-intensive and are likely to continue to be so to permit people to earn their living. It is therefore less likely that machinery that will drastically reduce the labour force required will be acquired. The economic impact of the proposed protocol will therefore need to be carefully evaluated.

B. *AGRICULTURAL EQUIPMENT*

10. When agriculture is considered, the first point to stress is that “agriculture” covers not only agriculture *strictu sensu*, but also forestry and fisheries, including aquaculture. Furthermore, the policies adopted by the States for the management of the natural resources involved, and the extent to which these resources are renewable, will have an effect on the purchasing power of those involved in that particular industry. If, for example, States impose fishing quotas, and consequently limit the use fishermen can make of their fleets, they are not likely to acquire new ships or other high-value equipment.

11. The information so far retrieved has given rise to a number of questions that need to be answered. These include:

- *Should only agriculture stricu sensu be covered, or also forestry and fisheries?*
- *What equipment is under consideration? Would it include also, for example, trucks for the transportation of agricultural produce to markets, ships, etc.?*
- *Does the agricultural equipment considered require large land holdings? If so, how large?*
- *Which countries have holdings large enough for the equipment under consideration?*

12. The statistics division of the *Food and Agriculture Organization of the United Nations (FAO)* indicates that, of the countries surveyed in the *1990 Round of Agricultural Censuses*, few have large average holdings. Those with average holdings of 50 hectares and above are: Canada (349.07 ha in 1991), USA (186.95 ha in 1987), Argentina (468.97 ha in 1988), Brazil (64.64 ha in 1985), Paraguay (77.53 ha in 1991), Finland (61.88 in 1990), United Kingdom (70.21 ha in 1993), and Australia (3601.68 ha in 1990). These figures are clearly only indicative of the situation today, considering their age and the fact that not all the countries of the world were

surveyed,[6] but a new census is under preparation. It should also be noted that large countries of Africa in which reports have it large holdings exist, were not covered by the survey – South Africa is a case in point.

13. The *International Fund for Agricultural Development (IFAD)* has issued *Regional Strategy Papers* for a number of regions of the world: Central and Eastern Europe and the Newly Independent States, Latin America and the Caribbean, Asia and the Pacific, Near East and North Africa, Eastern and Southern Africa, and Western and Central Africa.[7] The purpose is to examine the situation in these regions from the point of view of the IFAD strategy for the alleviation of rural poverty. Although the focus of these Regional Strategy Papers is very specialised, they do present some considerations of general interest that have relevance also for the proposed protocol.

14. As far as the economies in transition are concerned, according to the Regional Strategy Paper for Central and Eastern Europe and the Newly Independent States (CEN),[8] the privatization of agricultural land has resulted in extremely small and fragmented plots and ownership by the elderly or others with little interest in farming. According to the Strategy Paper the CEN region has experienced a decline in economic output and living standards rivalling that of the Great Depression of the 1930s. As a result, the countries of the region face considerable difficulties in all areas, from the institutional vacuum created by the collapse of central planning and State socialism, to access to markets, credit, fertilizers, appropriate technologies and other productive assets. The Strategy Paper states that "there has been a dramatic shift from large-scale rotating farming to the cultivation of subsistence crops for household food security. Only basic grains and potatoes are now grown in greater abundance than before, whereas the production of higher-value crops such as citrus fruits, tea, vegetables, wine and tobacco, which require specialized skills and dedicated processing equipment, has declined sharply".[9] In consideration of this development, many newly privatised input dealers are developing the types of services and product lines suitable for today's small-scale producers, thereby changing from being geared to the needs of large agricultural producers.

15. In this context the problem of environmental protection presents itself forcefully. The Strategy Paper reports that "[t]he general neglect of and lack of respect for the environment during the era of central planning have led to severe pollution of agricultural land. The uncontrolled exploitation of forests for fuel wood and communal land for grazing, together with the lack of land preservation measures, has caused significant soil erosion and degradation, seriously threatening crop and livestock production".[10] Such a state of affairs will inevitably have an effect on environmental policies adopted by the States, and consequently on who might

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6 The countries surveyed were: *Africa*: Burkina Faso, Congo (Dem. Rep. of), Djibouti, Egypt, Ethiopia, Guinea, Guinea-Bissau, Lesotho, Libya, Malawi, Namibia, Réunion, Uganda, *Northern and Central America*: Bahamas, Barbados, Canada, Dominica, Grenada, Guadeloupe, Honduras, Martinique, Panama, Puerto Rico, Saint Lucia, St. Kitts & Nevis, St. Vincent & the Grenadines, USA, Virgin Islands (US), *South America*: Argentina, Brazil, Colombia, French Guiana, Paraguay, Peru, *Asia*: Cyprus, India, Indonesia, Iran, Israel, Japan, Korea (Rep. of), Myanmar, Nepal, Pakistan, Philippine, Thailand, Turkey, Viet Nam, *Europe*: Albania, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Slovenia, Spain, Switzerland, United Kingdom, *Oceania*: American Samoa, Australia, Cook Islands, Fiji, French Polynesia, Guam, Northern Mariana Isl., Samoa.

7 The *Regional Strategy Papers* are all available on the IFAD web site (www.ifad.org).

8 IFAD, *Regional Strategy Paper – IFAD Strategy for Rural Poverty Reduction in Central and Eastern Europe and the Newly Independent States*, Rome, 2002. The countries covered in the paper are: Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, the Republic of Moldova, Romania, and the Former Yugoslav Republic of Macedonia.

9 *Ibid*, p. 5.

10 *Ibid*, p. 10.

conceivably be a beneficiary of the facilitations offered by a protocol to the Cape Town Convention.

16. In the region of Eastern and Southern Africa small-holder agriculture is by far the main income and livelihood source of the poor.[11] The majority of smallholders in Eastern and Southern Africa live and farm on land that has medium to high potential for increased production. Some 62% of the land base has medium to high potential for increased production, while 38% is desert. The Strategy Paper for Eastern and Southern Africa states that "[t]the rural poor frequently have inadequate landholdings, face enormous difficulties maintaining the productive value of that land, and few enjoy the benefits of water-management systems. They need to work with others to develop the improved information and technology to build more productive, sustainable systems. At the same time, they lack capital – whether on small farms or among rural enterprises – and access to the financial services needed to invest in those production systems".[12] The importance of this state of affairs for the proposed protocol needs to be assessed, as does the situation of the other regions that might be affected.

- *Forestry: Should forestry be covered by the proposed protocol?*

17. Forests are a natural resource which requires careful management, not the least because of their production of oxygen. Savage deforestation has in numerous areas of the world laid the basis for land slides and other natural disasters, most recently in the Philippines. Reports by the FAO indicate that "[d]eforestation, mainly conversion of forests to agricultural land, continues at an alarmingly high rate - about 13 million hectares per year. At the same time, forest planting, landscape restoration and natural expansion of forests have significantly reduced the net loss of forest area. The net change in forest area in the period 2000-2005 is estimated at -7.3 million hectares per year (an area about the size of Sierra Leone or Panama), down from -8.9 million hectares per year in the period 1990-2000. Africa and South America continued to have the largest net loss of forests. Oceania and North and Central America also had a net loss of forests. The forest area in Europe continued to expand, although at a slower rate. Asia, which had a net loss in the 1990s, reported a net gain of forests in the period 2000-2005, primarily due to large-scale afforestation reported by China."[13]

18. To a large extent the type of equipment required by the forestry industry will depend on the forestry management policies adopted by the States. In many countries the utmost importance is given to the adoption of environmentally sound criteria for the forestry industry, not only for the actually cutting down of trees, but also for the surrounding activities: for example, the construction of the roads necessary to carry away the timber, and the care to be exercised to avoid the pollution of lakes and running water.[14] In these countries there will therefore be a limit to how many trees, and which trees, may be cut down. Consequently, there will be a limit to the employment of logging equipment required for large-scale logging.

- *Fisheries: Should fisheries be covered by the proposed protocol?*
- *Should aquaculture be covered?*

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[11] See IFAD, *Regional Strategy Paper – IFAD Strategy for Rural Poverty Reduction in Eastern and Southern Africa, Rome, 2002.* Twenty-one countries are concerned by this strategy: Angola, Botswana, Burundi, Comoros, Eritrea, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Rwanda, Seychelles, South Africa, Swaziland, the United Republic of Tanzania, Uganda, Zambia and Zimbabwe.

[12] *Ibid*, p. 4.

[13] See the report on the web site of FAO at: www.fao.org/forestry/site/32248/en.

[14] See S. Haanshus, *Environmentally Sound Construction Methods and Use of Appropriate Equipment*, at: www.fao.org/docrep/x0622e/x0622e0k.htm for an examination of developments in Norway.

19. The first reaction to the suggestion that fisheries might be covered by the proposed protocol is to refute the idea, primarily by reason of the refusal of the shipping industry when the possibility of preparing a protocol specifically for ships was proposed. Ships would therefore be excluded; the question is whether all the equipment rotating around the ships should also be excluded, or whether it should instead be covered by a protocol, such as, for example, the cranes used to load and unload the ships in the ports, the trucks used to transport the loads of the ships to storage facilities, refrigeration facilities for fish, etc. It is however true that such equipment is not necessarily specific for the shipping industry, nor is it typically high-value and mobile equipment: trucks, for instance, are of course used in a number of different industries, as are cranes.

20. As regards aquaculture, not all aquaculture is conducted in protected basins. Aquaculture and even more mussel cultures, can be, indeed in the latter case invariably are, conducted in the sea, even if reasonably close to the coast. What equipment is used, and the possible need to cover such equipment by means of a protocol, would need to be further considered.

C. *CONSTRUCTION*

21. The construction industry covers not only the building of houses and other buildings, but also works of civil engineering, such as the construction of pipelines, bridges, railway tracks and motorways. It should however be noted that "the renovation and maintenance of existing structures accounts for almost 50% of total construction output in some of the more developed economies and an even greater share of employment".[15] When the construction industry is considered, it is necessary to delimit the industry. According to the *International Labour Organization (ILO)*, "[n]arrowly defined, the industry comprises only those enterprises 'adding value' through production or assembly operations on the construction site. A broader definition would include firms and individuals involved in planning, design, the supply of building materials, plant, equipment, transport and other services. Some definitions also include the customer, particularly the professional client or 'property developer'. The recent increase in the number of contractor-financed infrastructure projects might make it sensible to include the financial services sectors as well. *It is probably better to regard construction not as an industry, but as a loose agglomeration of agents and activities which can be unpackaged and packaged in different ways."*[16]

22. According to the ILO, "[t]here is an increasing tendency among enterprises in construction (as in other industries) to outsource the supply of goods and services required in the production process. Building materials, plant and equipment are generally purchased or hired from other enterprises. Specialized services are supplied by subcontractors, and labour by 'labour agents'. Design and engineering services are also provided by quite separate professional entities. Drawing the boundaries of the construction industry is therefore not easy". This is confirmed by the number of enterprises offering construction equipment for hire on internet. It should be noted that whether the option chosen by enterprises is the acquisition of the equipment or its hire will to a large extent depend on the taxation regime applicable.

23. If there is a pattern in the construction industry, it is that "the amount that a country spends on construction is closely related to its income. In 1998, expenditure varied from US$5 per head in Ethiopia to almost US$5,000 in Japan. This means that construction output, by value, is heavily concentrated in the rich, developed world. The high income countries of Europe are responsible for 30% of global output, the United States for 21% and Japan for 20%. China, despite its huge size and rapid economic growth in recent years, lags a long way behind with

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15 See the report at: http://www.ilo.org/public/english/dialogue/sector/sectors/constr.htm

16 *Ibid.* Italics in the original.

only 6%. India has 1.7%".[17] Furthermore, "[i]n the richer countries, where labour is expensive, machines have largely replaced workers in many of the tasks involved in new construction (although repair and maintenance is still very labour intensive). In developing countries, where labour is cheap, the majority of tasks are undertaken by manual methods with minimal use of machinery and equipment."[18]

24. The conclusion that may be drawn is that those in the construction industry that would benefit most from a protocol to the Cape Town Convention are located in the developed world. To confirm this conclusion, it would be necessary to check that the figures are valid for the different types of construction, the large civil engineering works as well as the building of buildings.

25. As regards the countries of origin of manufacturers of construction equipment, internet sources indicate that there are a great number of different countries that export construction equipment. For example, the *ExportBureau*, a non-profit global directory, lists[19] exporters from China, France, Germany, India, Iran, Israel, Italy, Lithuania, Turkey, Republic of Korea, Saudi Arabia, and the United States when a search for exporters of mixed construction equipment is made – one of 53 categories, many of which do not deal with high-value equipment. As regards the countries of origin of importers, they would appear to be as varied. The *International Directory Of Importers Construction & Building Equipment* lists importers in practically all countries on all continents.[20] The full Directory is however available against payment only. Both lists would need to be consulted by an expert to assess the value of the equipment.

D. *MINING*

26. A number of different questions have to be considered in relation to mining: what is mined, where, whether the mines are government run or private, for instance. As is stated by the ILO, minerals and mineral products are the backbone of most industries and some form of mining or quarrying is carried out in virtually every country in the world.[21] It would therefore be necessary to make a survey to establish what mining industry should be targeted, as not all mining activities are large-scale, and consequently also in which countries it is situated, which countries high-value mining equipment is exported from, which it is imported into, and the actual need for a protocol to facilitate the acquisition of such equipment.

27. Environmental considerations again come into play, considering the nature of mining activities. Globally, some 50 billion tonnes of ore are mined each year, i.e. the equivalent of digging a one metre deep hole the size of Switzerland every year.[22] The policies adopted by the States are therefore crucial in assessing the importance of a protocol to the Cape Town Convention. In some instances the mining industry is of critical importance, such as for instance coal mining in China. Linked to this is the debate on the use of minerals: "[t]he debate on global warming […] could affect the use of coal in some areas; recycling lessens the amount of new material required; and the increasing use of non-mineral materials, such as plastics, affects the intensity of use of metals and minerals per unit of GDP".[23] The effects of such factors on the acquisition of equipment need to be considered.

28. As regards the countries of origin of both exporters and importers of mining equipment, the situation is similar to that of construction equipment. The information is fragmentary. Often

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17 http://www.ilo.org/public/english/dialogue/sector/sectors/constr/global.htm

18 *Ibid.*

19 See www.exportbureau.com.

20 See www.importersnet.com.

21 See the report at http://www.ilo.org/public/english/dialogue/sector/sectors/mining.htm.

22 *Ibid.*

23 *Ibid.*

exporters and importers are listed by type of equipment, which increases the difficulty to obtain global statistics. The assistance of an expert would be necessary to organise the information available in a manner useful to the study which should establish the utility of a protocol to the Cape Town Convention.

CONCLUSION

29. The data collected by the Secretariat up until the time of writing (February 2006) has evidenced the differences between the three different types of equipment that it is proposed be dealt with together in a fourth protocol to the *2001 Cape Town Convention on International Interests in Mobile Equipment:* agricultural equipment, construction equipment and mining equipment. Each of these industries is multifaceted, with the possibility that the equipment used in the different sectors of each will differ, the value also differing markedly. The information retrieved so far is fragmentary. An in-depth study would be necessary for each type of equipment. What is clear, is that expert knowledge in the field concerned is necessary if a serious assessment of the need for such a protocol, of its chances of success, is to be made. A substantial investment of staff resources as well as substantial assistance for relevant research (for example by organisations such as the World Bank, the regional development banks, the OECD) or, alternatively, a substantial investment in outsourced and paid for research, would therefore be needed. Fundamental is, *inter alia*, also the question whether the three industries fit into one and the same protocol, or whether it would not be better for them to be separated. This is clearly something that only experts can decide.

ACTION TO BE TAKEN

30. The Council has the following options before it in instructing the Secretariat on how to proceed with this project:

1. to go back on the decision taken in 2005 by deciding that work should be discontinued;

2. to postpone work until such time as resources can be freed to pay for the fees of experts in the three fields concerned;

3. to request the Secretariat to continue its preliminary research until such time as resources can be freed to pay for the fees of experts in the three fields concerned, in particular by circulating a questionnaire among member States to elicit the information needed for the background document; and

4. to authorise the Secretariat to enlist the assistance of experts in the field. It is suggested that each expert should first consider the need for a protocol from the point of view of his/her area of expertise, then a meeting with all three experts should be organised to discuss whether or not one protocol could cover all three types of equipment.

APPENDIX I

LIST OF AGRICULTURAL AND FORESTRY EQUIPMENT

(a) ***Agricultural equipment*** as classified in Appendix 6 to FAO Statistical Development Series No. 11: A system of integrated agricultural censuses and surveys Volume 1 World Programme for the Census of Agriculture 2010 (Food and Agriculture Organization of the United Nations Rome, 2005)[24]

CATEGORY OF EQUIPMENT	SUB-CATEGORY OF EQUIPMENT	SUB-SUB-CATEGORY OF EQUIPMENT	TYPES OF MACHINERY AND EQUIPMENT INCLUDED IN THE CATEGORY
MANUALLY-OPERATED EQUIPMENT			Seed/fertilizer drill
			Transplanter
			Thresher
			Winnower
			Sprayer
			Duster
			Hand pump or other irrigation devices
ANIMAL-POWERED EQUIPMENT			Wooden plough
			Steel plough
			Cultivator
			Disk harrow
			Seed/fertilizer drill
			Leveller
			Animal cart
			Animal-operated irrigation devices
MACHINE-POWERED EQUIPMENT	Machines for general farm use		Internal combustion engine
			External combustion engine
			Electric generator
			Electric motor
			Computer used for farm management
			Other electronic equipment used for farm management
	Tractors, bulldozers and other vehicles		Track-laying tractor
			Four-wheel tractor
			Single-axle tractor
			Bulldozer
			Carryall
			Truck
			Boat
			Other vehicle
			Trailer
	Crop machinery and equipment	*Land preparation and planting machinery and equipment*	Power tiller
			Plough
			Rotary tiller
			Rotary harrow

[24] The publication is to be found at: http://www.fao.org/es/ess/census/wca2010.asp.

			Disk harrow
			Grain drill
			Broadcast seeder
			Seed/ Cultivator fertilizer drill
			Planters
			Levellers
			Diggers
			Land plane
			Transplanter
		Crop maintenance machinery and equipment	Manure spreader
			Fertilizer broadcaster
			Sprayer
			Duster
			Water pump
			Sprayers and other localised irrigation devices
			Other irrigation equipment
		Crop harvesting machinery and equipment	Mower for grass crops
			Hayrake
			Haybaler
			Forage harvester
			Forage blower
			Combine harvesters
			Corn picker
			Digger, potato harvester
			Sugar beet harvester
			Reaper-binder
		Post-harvest machinery and equipment	Thresher
			Grain cleaner
			Sorters and graders
	Livestock machinery and equipment		Milking machine
			Milk cooler
			Cream separator
			Incubator
	Aquaculture machinery and equipment		

(b) ***Forestry equipment*** would include:[25]

Cable Log Skidders	Clam Bunk Skidders	Wheeled Tree Harvesters
Delimbers	Forestry Excavators	
Forwarders	Grapple Log Skidders	
Knuckle Boom Log Loaders	Track Feller Bunchers	
Track Log Loaders	Track Tree Harvesters	
Wheeled Feller Bunchers	Wheeled Log Loaders	

[25] See data included in the web site on Construction Equipment at: http://www.constructionequipment.com/community/862/Forestry/23511.html

APPENDIX II

LIST OF CONSTRUCTION EQUIPMENT

There are numerous categories of construction equipment. These include: earthmoving equipment, lifting and concrete placing, paving and materials production, compaction, compact equipment, attachments, trucking and hauling, underground equipment, light equipment, demolition, recycling and waste handling, forestry, maintenance and repair, construction materials and supplies, safety and security and construction technology and software. Below, a selection of the above categories have been expanded in table form.[26]

EARTHMOVING	
Backhoe Loaders >=14 feet	Barges, Sectional
Bucket Loaders	Cable Layers
Crawler Dozers	Crawler Excavators > 6 metric tonnes, or 13,200 lbs.
Crawler Loaders	Crawler Tractors
Dewatering & Wellpoint Systems	Dredges
Drills, Caisson	Drills, Core
Drivers, Pile, Post & Sheeting	Electronic Grade-Control Systems (See Construction Technology & Software)
Hammers, Pile Driving	Loader Bucket Scales
Motor Graders	Off-Highway Haulers (See Trucking & Hauling)
Pile Driving Accessories	Pile Extractors
Pull Type Scrapers	Pumps, Dredge
Rock Drills, Air, Self-Propelled	Rock Drills, Hydraulic, Self-Propelled
Rollers & Compactors (See	
LIFTING & CONCRETE PLACEMENT	
All Terrain Cranes	Articulating Boom Aerial Platform, Self Propelled
Articulating Boom Aerial Platform, Truck & Trailer	Bridge Inspection Arms
Bucket Grabs (also see Grapples)	Carrier Mounted Hydraulic Cranes
Carrier Mounted Lattice Boom Cranes	Chain, Slings, Hooks, Assemblies, Fittings (See Maintenace & Repair)
Concrete Buckets	Concrete Buggies & Dumpers, Powered
Concrete Chutes	Concrete Conveyors
Concrete Forms	Concrete Grouters
Concrete Hoppers for Hoisting	Concrete Pavers (See Paving & Materials Production)
Concrete Placer Spreaders	Concrete Placing Booms, Crane-Mounted
Concrete Pumps	Concrete Structure Slipforms
Crane Boom Guards (See Safety & Security)	Crawler Mounted Cranes
Derricks, All Types	Floats (See Light Equipment)
Forklifts, Rough-Terrain Vertical-Mast	Form Sprayers
Forming Accessories: Concrete Anchors, Bolts, Clamps, Ties, Hangers, Fasteners, Strapping,	Gantry Cranes

[26] See the web site on Construction Equipment at: http://www.constructionequipment.com/community/862/Forestry/23511.html

and Other Hardware	
Gunning Equipment, Concrete	High Lift Loaders
Hoists, Materials & Personnel	Hoists, Tractor- or Truck-Mounted
Load Binders	Pole Erectors
Pre-Stressing Equipment, Concrete	Rollers & Equipment Movers
Rough Terrain Cranes	Rubbing Machines, Concrete
Scaffolding	Scissor Lift Aerial Platform, Self Propelled
Scissor Lift Aerial Platform, Truck and Trailer Mounted	Shores for Concrete Forming
Stationary Mixers, All Types (See Paving & Materials Production)	Straddle Cranes
Telehandlers	Telescoping Boom Aerial Platform, Self Propelled
Telescoping Boom Aerial Platform, Truck & Trailer Mounted	Tower Cranes
Troweling Machines, Concrete	Truck Mounted Cranes
Tunnel Forms	Vibrators, Back Pack
Vibrators, Concrete, Internal	Vibrators, External Form
Wire Rope (See Maintenance & Repair)	Yard Cranes
PAVING & MATERIALS PRODUCTION	
Air & Water Pollution Devices	Asphalt Hand Tools (See Light Equipment)
Asphalt Mixers	Asphalt Pave Extensions
Asphalt Pavers, Tracked	Asphalt Pavers, Wheeled
Batching & Mixing Plants, Asphalt	Batching & Mixing Plants, Concrete
Batching & Mixing Plants, Waste Heat Recovery Equipment	Batching Plant Control Systems (Incl. Scales), Automatic
Bin Level Indicators	Bins, Aggregate & Cement Storage
Bins, Asphalt Surge & Storage	Bridge Deck Forms & Road Forms
Bridge Finishers	Buckets, Elevator
Cage Mills	Classifiers, Sand
Cold Planers & Milling Machines	Collection Systems, Dust
Concrete Mixers	Concrete Pavers
Concrete Reclaimers	Concrete Screeds
Concrete Vibrators (See Lifting & Concrete Placement)	Containers, Materials Handling
Controls, Electric, Hydraulic, Pneumatic	Conveyor Rollers & Conveyor Idlers
Conveyors & Feeders, All Types	Conveyors, Shuttle
Crushing & Screening Plants, Portable	Crushing & Screening Plants, Stationary
Curb and Gutter Paver	Dispensers, Epoxy, High-Pressure
Distributors, Bituminous	Driers, Aggregate
Dump Body Vibrators (See Trucking & Hauling)	Dust Control
Elevators, Materials Handling	Emulsified Asphalt, Recycled Pavement, Mobile Machines
Fine Graders & Subgraders	Form Graders
Form Stake Pullers	Heaters
Hoppers: Cement, Aggregate, Sand	Hydrodemolition Equipment
Joint Heaters, Bituminous Paving	Joint Routers, Highway
Joint Seal Machines	Joint-Filling Machines, Highway
Kettles: Asphalt, Tar, Pitch, Etc.	Kilns, Rotary
Loaders, Conveyor Belt, Portable	Magnets, Scrap Metal

Maintainers, Self-Propelled	Mesh Installing Machines
Mortar & Plaster Mixers	Parting Compounds, Concrete
Patching Plants, Asphalt	Pavement Recycling Plants
Pavement Saws (See Light Equipment)	Paver Feeders, Asphalt
Pulverizers	Pumps, Asphalt
Reclaimers & Recyclers, In-Place	Recycling Plants, Concrete & Asphalt
Road Markings (See Safety & Security)	Road Wideners
Scales	Screeds, Asphalt
Screen, Wire Cloth	Screens, Vibrating Aggregate Sizing
Sealcoats, Applicators, Pavement	Shoulder Spreaders
Silos, Cement	Slipforms, Concrete Paving
Slope & Canal Pavers	Slurry Machines
Soil Stabilizing Equipment	Sprayers, Bituminous
Sprayers, Concrete Curing	Spreaders, Cement
Spreaders, Sand & Stone	Surfacers, Concrete Grinding
Surfacers, Concrete Slab	Tanks, Bituminous Storage & Heating
Tanks, Steel, Bulk Storage	Tanks, Truck & Trailer
Tines, Pugmill	Tools, Hand, Asphalt
Tramp Metal Detectors & Separators	Unloaders, Bottom-Dump Truck
Unloaders, Car & Cement	Vibrators, Bin
Vibrators, Concrete, Paving	Washers, Aggregate & Sand
Windrow Loaders, Paver-Attached	Windrow Loaders, Self-Propelled
COMPACTION	
Combination Rollers, Smooth Drum & Tires	Compaction Wheels
Form Tampers	Landfill Compactors
Pneumatic Tire Rollers	Sheepsfoot Rollers or Padfoot Rollers
Single Smooth Drum Vibratory Rollers	Static Steel Rollers
Tampers, Ram Type	Tandem Vibratory Rollers
Towed Rollers & Compactors	Trench Rollers
Vibratory Plate Compactors	Vibratory Tampers, Boom-Mounted
Vibratory Walk-Behind Rollers	
TRUCKING & HAULING	
Articulated Dump Trucks, Off-Highway	Bodies, Aluminum, Truck
Bodies, Bulk Materials (also see Trailers)	Bodies, Concrete Mixer (Also See Mixer Trucks, Concrete)
Bodies, Concrete, Non-Agitating	Bodies, Dump, Truck
Bodies, Refuse Collection	Bodies, Tank (also see Bodies, Bulk Materials)
Bodies, Trailer, Dump	Bodies, Utility Types
Bumpers, Truck	Carriers, Crane & Shovel
Carriers, Mixer	Dump Body Vibrators
Haulers, Off-Highway	Heaters, Tank Car & Truck
Heavy-Duty Trucks, Class 8, Over 33,000 GVW	Inverters (DC to AC)
Loader Attachments for Truck Mounting	Loadsters
Medium-Duty Trucks, Classes 3 - 5, From 10,001 to 33,000 GVW	Mixer Trucks, Concrete
Pickup Trucks, Classes 1 to 2, Up to 10,000 GVW	Power Take-Offs
Rigid Frame Trucks, Off-Highway	Service Trucks
Snow Removal Equipment: Snow Plows, Snow Blowers, Wings, Blades, Salt Spreaders, Etc.	Tailgates, Truck

Tanks, Truck and Trailer (See Paving & Materials Production)	Tires (See Maintenance & Repair)
Trailer Dollies	Trailer Parts
Trailers, Bottom-Dump	Trailers, Bulk Materials
Trailers, Concrete Mixer	Trailers, End-Dump
Trailers, Flat-Bed & Platform	Trailers, Jacks
Trailers, Low-Bed, Equipment	Trailers, Pole
Trailers, Side-Dump	Trailers, Special Purpose
Trailers, Straddle Type	Trailers, Tank
Trailers, Van	Truck Bed Liners
Vehicles, Special Purpose, All-Wheel Drive	Wagons, Bottom-Dump
Water Trucks	Weigh Systems & Equipment
UNDERGROUND EQUIPMENT	
Directional Boring Equipment	Ditchers (also see Trenchers)
Inspection Equipment, Sewer & Pipe	Piercing Tools
Pipe & Cable Locators	Pipe Layers
Pipe Rehab Equip: Pipe Bursting, Pipe Jacking, Liners, Etc.	Saws, Rock
Trench Shoring (See Safety & Security, Trench Shoring Boxes & Systems)	Trenchers
Tunnel Mining Machines & Equipment	Vacuum Excavation
Vibratory Plows	

APPENDIX III

LIST OF MINING EQUIPMENT

There are numerous categories of mining equipment. It should however be pointed out that there are also categories of equipment that are associated with mining, even if they are not involved in the actual drilling (e.g. the equipment necessary for analytical laboratories). The list below is taken from the web site of *CAMESE – Canadian Association of Mining Equipment and Services for Export.*[27]

Analytical Laboratories and Supplies Associations	Geophysical Surveys and Consulting
Automation and Communications	Geotechnical Instrumentation
Blasting Equipment and Services	Ground Control Equipment and Supplies
Buildings, Portable	Hoisting Equipment and Accessories
Bulk Materials (Ore) Handling Equipment	Inventory Management
Camp Management Services and Supplies	Management Consulting Services
Closure, Reclamation and Remediation	Mapping Services
Compressors, Air	Mine Site Construction
Consulting Geologists and Engineers	Mineral Processing - Pumps, Pipes and Valves
Diesel Engines and Accessories Doors	Mineral Processing Equipment and Supplies
Drilling Contract Services	Mineral Processing Services
Drilling Equipment and Supplies	Mining Engineering and Contracting
Electric Power Equipment	Mining Instrumentation
Environmental Equipment and Services	Process Chemicals and Minerals
Equipment Maintenance and Repair	Safety Equipment
Exhaust Emission Control	Smelting and Refining Equipment and Services
Exploration Supplies	Software
Export Consulting and Support Services	Surface Mobile Equipment and Components
Geophysical Instrumentation	Underground Vehicles, Equipment and Components
	Ventilation Equipment and Components
	Water Monitoring Equipment

[27] See the CAMESE web site at: http://www.camese.org/.