National Occupational Health Profile – Maldives

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National Occupational Health Profile – Maldives

Table of Contents

Title                                                                                       Page No.
Background Information                                                                 1
Methodology                                                                               1
General Profile                                                                            2
Employment according to economic sectors                                                   3
Hazardous Occupations                                                                     3
Estimated burden of diseases due to occupational factors                                  4
Existing national legislations and policies and international collaboration               4
National Stake Holders’ Workshop on Occupational Health                                  6
Conclusions                                                                               7
Recommendations                                                                           9
Tables                                                                                     10-12
   Table 1 Distribution of National Workshop                                                10
   Table 2 Expatriate employment in 2006 and 2007                                           11
   Table 3 ILO estimates of work-related injuries and diseases                             12
Annexes                                                                                   13 – 36
   Annex 1 Field Visit Programme                                                           13
   Annex 2 Key Hazardous Occupations                                                       14
   Annex 3 Workers Health : Health Act of Maldives                                         21
   Annex 4 Strategy for Injury Prevention                                                   24
   Annex 5 Stake Holders’ Workshop Report                                                  29
   Annex 6 Documents consulted                                                             36
Occupational Health Profile - Maldives

Background Information:
In July 2008, Ministry of Health requested technical assistance from the SEARO to prepare a country profile on occupational health with following Terms of References (TOR):

- To develop a country profile on Occupational Health.
- To guide on the development of occupational health policy.
- To facilitate a stakeholders meeting to discuss and finalize the country profile on occupational health in Male’.
- To sensitize relevant sectors on occupational health issues.

In response to the above request, the Regional Director asked OEH- SEARO to visit Maldives from 17th Aug to 30 Aug and submit the report.

Methodology:
This report is based on (1) Visit of select industries, (2) Meeting with various stake holders (3) Review of relevant national legislations and policies (4) National Occupational Health workshop of the stake holders and (5) Internet search. The details of the programme is depicted in annex 1.

- Industries visited.
  - Felivaru Island - Maldives Industrial Fisheries Company
  - Discussion with diving experts
  - Villingili - Various construction sites

- Meetings
  - Ministry of health
  - Ministry of transport (including port and sea-port authorities)
General Profile:

Maldives is an archipelago comprising of 1190 islands of which 199 are inhabited. Total population of Maldives in 2006 was 298,842. Tourism, Maldives' largest industry, accounts for 28% of GDP and more than 60% of the Maldives' foreign exchange receipts. Industry, consists mainly of mechanised fishing, fish processing, boat building, construction, and handicrafts. Fishing is the second leading sector. Agriculture continue to play a lesser role in the economy, constrained by the limited availability of cultivable land and the shortage of domestic labour. Government with the help of international agencies is making effort to use newer agricultural techniques to overcome challenges. Real GDP growth averaged over 7.5% per year for more than a decade and today Maldives enjoys the highest GDP per capita $4,600 (2007 est) among south Asian countries resulting into its promotion from least developed countries to lower middle income county.

Some of the salient health related features in 2006 are:

- The crude death rate of 3 per 1000 is low compared to other countries of the Region.
- MDG progress towards health-related MDGs is on track.
- Considerable progress has been made in the control of communicable diseases. However, no data is available on chronic diseases however, it is estimated that more than 45% of the deaths in 2003 could have occurred due to cardiovascular diseases.
- Spends over 6% of the its GDP on health of which about 1/3 is spent on preventive services; per capita spending on health is better than other countries in the Region.

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1 11 health questions about the 11 SEAR countries. WHO – SEARO. Available at [http://www.searo.who.int/en/section1243.htm](http://www.searo.who.int/en/section1243.htm)
The challenges in the health sector includes – undernutrition amongst women and children, lack of infrastructure and human resources to enforce legislation, inequities, between Male’ and atolls.

**Employment according to Economic Activities:**

The employment of the locals and expatriates based on information from Ministry of higher education, employment and social security\(^2\) is depicted in table 1 and table 2 respectively. Salient features are as follows:

- Tourism, fishing, manufacturing, related industries and service sector are major sources of employment to the locals.
- Compared to other countries in the Region, agriculture plays minor role in country’s economy.
- Details with regard to manufacturing industries is not available and data with regard to economic sector is not available in case of about 10% male and 32% female workers.
- Migrant workers form about 45% of the total workforce.
- There is about 30% growth in employment of migrant (expatriate) workers between 2006 and 2007.
- Migrant workers are employed mainly in construction, tourism and service related industries

**Hazardous Occupations:**

Annex 2 shows the details of major hazardous occupations which can be summarised as follows:

- Construction work, fishing, occupational diving, fiberglass boat building, work in automobile garages, fish processing, carpentry, health care, loading and unloading at dockyards and agriculture are key hazardous occupations.

\(^2\) [http://www.employment.gov.mv/Resources/Year%202007.asp](http://www.employment.gov.mv/Resources/Year%202007.asp)
• Construction workers mostly migrant labourers are exposed to the risk of accidents from fall and injuries from other objects. They are also exposed to dusts, chemicals (solvents, paints, pesticides) and physical hazards.

• Fibre glass boat building is an expanding chemical based industry. Unprotected workers working in confined spaces are exposed to toxic chemicals like acetone, methyl ethyl ketone peroxide, styrene etc. Long term exposure to these chemicals can result in severe damage to nervous system, liver and kidneys. Some of them are possible carcinogens.

• Indigenous divers are exposed to the risk of drowning, nitrogen narcosis and barotraumas resulting from descent or ascent and decompression sickness due to arterial embolism.

• Agriculture workers are particularly exposed to the highly hazardous pesticides belonging WHO category Ia and category Ib due to lack of restriction on import of these pesticides, free sale in the market and lack of awareness at the user level.

• Fisherman are exposed to extreme weathers, accidents on the board, ultraviolet radiations, glare from the sea surface and psychosocial problems.

• Fish processing workers are exposed to ergonomic hazards resulting from repetitive movements, skin allergies to fish proteins and rubber gloves and frostbite.

Burden of Disease due Occupational Risk Factors:

Due to lack of legal requirement for reporting and recording keeping of work related injuries and diseases no information is available with regard to the incidence. ILO Safework Report, 2005 estimated that in 2002, there were 13 work-related fatal accidents, 9100 non fatal accidents, 41 deaths due to work related diseases and 11 deaths due to dangerous substances.

National Legislation for Health and Safety at Work place:

There is no national legislation to protect health and safety of the workers. The National Employment Act refers only to notification of work-related injuries requiring medical attention. However, there is no provision for punitive action for non compliance. Following documents containing proposed National Health Act, Health and Safety policy on Male’ commercial

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**Proposed Health Act of Maldives – Article 8: Workers’ Health.** Recently the Ministry of Health prepared draft “Health Act of Maldives”. This proposed Act contains a chapter on workers’ health (Article 8) (annex 3). It begins with the recognition that the improvement in the workers’ health requires a comprehensive approach to protect and promote health at work including reduction and mitigation of occupational risks for health and safety, development of favourable physical and psycho-social work environment as well as healthy work-related behaviour. The Act is comprehensive and covers with aspects like national policy, healthy workplaces, workers’ health services, list of occupational diseases and special protection of vulnerable workers.

**Health and Safety Policy on Male’ Commercial Harbor (MCH) (Draft)** In 2006, MCH safety committee formulated policy based on ILO Occupational Safety and Health (Dock Work) Convention No 152. This policy covers safety precautions and recommendations for the better prevention of accidents, incidents, serious harm, and for the wellbeing of employees and all other persons engaged in, or in the vicinity of, port operations. The policy lays down the duty of the employer to ensure safety and health of the employees at work and details the various actions. It also lays down the duties of the employees to ensure their own and others’ safety while at work.

**Strategic Plan for Injury Prevention (2007 – 2011)** This comprehensive strategic plan (annex 4) was developed and endorsed by the Department of Public Health in collaboration with the Ministry for Transport and Communication, Ministry of Higher Education and Employment and Social Security, Maldives Police Services, Ministry of Home Affairs, Ministry of Construction and Public Infrastructure, Male’ Municipality and Indira Gandhi Memorial Hospital. WHO provided technical guidance in developing the Strategy for Injury Prevention. This strategy consists of a mechanism at central and regional level to monitor the magnitude and burden of injuries; injury prevention incorporated into public health agenda; establishment of intersectoral committee to strengthen collaboration and coordination and harmonization of policies; develop
and implement action plan and develop effective laws/rules and regulations related to injuries through advocacy.

**Legislation on Chemical Safety:** There is no national legislation on chemical safety. No chemicals are manufactured in Maldives. The import of chemicals is regulated by the Ministry of Defense and National Security (MDNS). Law No. 17/77 (The Law on Drugs) and Law No. 4/75 (The Law on Items Prohibited to be Brought in to Maldives) deal to regulate import of prohibited chemicals used as drugs, drug precursors or explosives. Import of other chemicals is regulated by the MDNS in consultation with the intersectoral committees. There is no control on the quality of the chemicals and labeling. There is no pesticide registration committee.

**International Partnership:** Maldives is not a member of ILO but signed an MoU with ILO for technical support in August 2008 and intends to join ILO very soon. Maldives is signatory to the following UNEP conventions dealing with the environmental chemicals safety.

**Stakeholders’ Workshop on Occupational Health:**

Stakeholders’ Workshop on Occupational Health in Maldives was held on 26th August 2008 at STELCO conference room, Male’. The objectives of this workshop were as follows:

1. To appraise and discuss the findings/observations of OEH/SEARO on Occupational Health Profile – Maldives
2. To identify -
   a. important hazardous occupations
   b. regulatory and non-regulatory mechanisms and
   c. challenges related to workers’ health in Maldives
3. To recommend action to meet the challenges

The participants included representatives from Department of Public Health, Min. of Higher Education, Employment and Social Security, Min. of Tourism and Civil Aviation, Min. of
Fisheries, Agriculture & Marine Resource, Maldives Police Service, Min. of Environment, Energy & Water, WHO, Maldivian Medical Association, Maldivian Nurses Association and representatives of the employers of the construction industries, diving school, Maldives ports etc.

The workshop report (annex 5) was circulated amongst the participants on 10th Sept ‘08 and their feedback is awaited.

Conclusions:

• During last two decades Maldives has made remarkable growth in economic and health sector. However, the area of occupational health has remained largely neglected.

• Growth in key economic sectors such as construction industry, fisheries, fibreglass boat building, transportation, fisheries, tourism and agriculture has resulted into intensification of existing hazards and emergence of newer chemical and psycho-social hazards.

• Major challenges are:
  o complete lack of national policy and any form of legislation on occupational health and safety
  o absence of mechanism for reporting work-related injuries and diseases
  o lack of human resources (expertise) required for recognition, monitoring and control of work-related hazards
  o lack of effective legislation on import and use of hazardous chemicals
  o lack of awareness amongst the stake holders
  o lack of any kind of formal mechanism for coordination between stake holder ministries
  o large migrant workforce having no right for union formation and representation of the grievances

• Opportunities:
  o Proposed Health Act of Maldives (MoH) contain several provisions for the health and safety of the workers in all occupations. The policy document entitled “
Health and Safety Policy of Male’ Commercial Harbour (MCH)” can be updated and supplement provisions of Health Act.

- Strategic Plan for Injury Prevention (2007 – 2011) developed and approved by several stake holding ministries demonstrates the willingness of various ministries to participate in health related problems.

- Recent MoU with ILO for technical support can be used for occupational and safety development.
### Recommendations:

**RECOMMENDATIONS:**

<table>
<thead>
<tr>
<th>Recommendation(s)</th>
<th>Action by</th>
<th>Due Date (DD-MMM-YYYY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prepare national policy, enact national legislation and plan of action based on the following: 1. Proposed health Act and other relevant policy documents. 2. WHA resolution 60.26 Workers’ Health and ILO Promotional Framework for Occupational Health and Safety 2006 Discuss with other stakeholders and get their endorsement. The network and mechanism for getting multiple stakeholders’ endorsement for injury prevention strategy 2007 – 2012 may be used.</td>
<td>1. Ministry of Health. 2. Ministry of Employment 2. WHO and ILO may provide technical support 3. SDE and OEH to facilitate liaison with ILO</td>
<td>Sept 2009.</td>
</tr>
<tr>
<td>2. Capacity Building Human resource development –  ◦ Two fellowships each for 1 year training in Occupational Health (medical person), Occupational Hygiene (non medical scientist form Min Employment) School of tropical medicine London. (biennium 2010-11)  ◦ Short term (2 weeks) training programmes for occupational health (2) and occupational hygiene (2) (resources may be found at WHO country office or SEARO may requested for support) In-country training programme for the health care workers. (resources may be found at WHO country office or SEARO may requested for support)</td>
<td>WR Maldives</td>
<td>Dec 2010</td>
</tr>
<tr>
<td>4. Development of Project Proposal for sound management of Chemicals and send to Strategic Alliance for International Chemicals Management</td>
<td>FCS OEH to provide technical support</td>
<td>March 2009.</td>
</tr>
</tbody>
</table>
Table 1. Distribution of the national workforce according to economic activity.

<table>
<thead>
<tr>
<th>Economic Activity</th>
<th>Both Sexes</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Agriculture, Forestry</td>
<td>2495 (3%)</td>
<td>1059 (2%)</td>
<td>1436 (5%)</td>
</tr>
<tr>
<td>2. Fishing</td>
<td>9294 (11%)</td>
<td>9181 (16%)</td>
<td>113 (- %)</td>
</tr>
<tr>
<td>3. Quarrying</td>
<td>473 (1%)</td>
<td>448 (1%)</td>
<td>25 (- %)</td>
</tr>
<tr>
<td>4. Manufacturing</td>
<td>11081 (13%)</td>
<td>4292 (7%)</td>
<td>6789 (23%)</td>
</tr>
<tr>
<td>5. Electricity, gas, water</td>
<td>1132 (1%)</td>
<td>1027 (2%)</td>
<td>105 (- %)</td>
</tr>
<tr>
<td>6. Construction</td>
<td>3691 (4%)</td>
<td>3635 (6%)</td>
<td>56 (- %)</td>
</tr>
<tr>
<td>7. Whole sale, retail trade</td>
<td>5858 (7%)</td>
<td>4810 (8%)</td>
<td>1048 (4%)</td>
</tr>
<tr>
<td>8. Hotels, restaurants</td>
<td>9748 (11%)</td>
<td>9237 (16%)</td>
<td>511 (2%)</td>
</tr>
<tr>
<td>9. Transport, storage, communication</td>
<td>7873 (9%)</td>
<td>7175 (13%)</td>
<td>698 (2%)</td>
</tr>
<tr>
<td>10. Finance, business services</td>
<td>1690 (2%)</td>
<td>1064 (2%)</td>
<td>626 (2%)</td>
</tr>
<tr>
<td>11. Community, social services</td>
<td>18089 (21%)</td>
<td>9716 (17%)</td>
<td>8373 (29%)</td>
</tr>
<tr>
<td>12. Not Stated</td>
<td>14821 (17%)</td>
<td>5707 (10%)</td>
<td>9114 (32%)</td>
</tr>
<tr>
<td>Total</td>
<td>86245</td>
<td>57351(100%)</td>
<td>28894(100%)</td>
</tr>
</tbody>
</table>

Source: Ministry of Higher Education, Employment and Social Security
### Table 2: Expatriate Employment in 2006 and 2007 by Industry

<table>
<thead>
<tr>
<th>INDUSTRY</th>
<th>2006</th>
<th>2007</th>
<th>ANNUAL GROWTH RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td>53,901</td>
<td>70,075</td>
<td>30.01%</td>
</tr>
<tr>
<td>Agriculture and Forestry</td>
<td>481</td>
<td>487</td>
<td>1.25%</td>
</tr>
<tr>
<td>Fishing</td>
<td>1,534</td>
<td>1,688</td>
<td>10.04%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>1,065</td>
<td>1,406</td>
<td>32.02%</td>
</tr>
<tr>
<td>Electricity, Gas and Water</td>
<td>115</td>
<td>222</td>
<td>93.04%</td>
</tr>
<tr>
<td>Construction</td>
<td>16,415</td>
<td>27,958</td>
<td>70.32%</td>
</tr>
<tr>
<td>Education</td>
<td>2,424</td>
<td>2,712</td>
<td>11.88%</td>
</tr>
<tr>
<td>Wholesale and Retail Trade</td>
<td>1,744</td>
<td>2,074</td>
<td>18.92%</td>
</tr>
<tr>
<td>Hotels and Restaurants</td>
<td>3,036</td>
<td>3,462</td>
<td>14.03%</td>
</tr>
<tr>
<td>Tourism</td>
<td>11,095</td>
<td>12,352</td>
<td>11.33%</td>
</tr>
<tr>
<td>Transport, Storage and Communication</td>
<td>1,077</td>
<td>1,273</td>
<td>18.20%</td>
</tr>
<tr>
<td>Financing, insurance, business and real estate</td>
<td>6,613</td>
<td>7,104</td>
<td>7.42%</td>
</tr>
<tr>
<td>Other community, social and personal services</td>
<td>8,302</td>
<td>9,337</td>
<td>12.47%</td>
</tr>
</tbody>
</table>
Table 3: ILO Estimates of Work related accidents and diseases in Maldives for 2002.
(Source ILO – Safework 2005)

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economically Active Population</td>
<td>86,246</td>
</tr>
<tr>
<td>Agriculture and fisheries</td>
<td>21,562</td>
</tr>
<tr>
<td>Manufacture</td>
<td>13,799</td>
</tr>
<tr>
<td>Services</td>
<td>50,885</td>
</tr>
<tr>
<td>Fatality Work-related accidents</td>
<td>13</td>
</tr>
<tr>
<td>Non fatal accidents resulting into 3 or more days absence</td>
<td>9,100</td>
</tr>
<tr>
<td>Fatalities due to work-related diseases</td>
<td>41</td>
</tr>
<tr>
<td>Fatalities due to dangerous substances</td>
<td>11</td>
</tr>
</tbody>
</table>
## Annex 1 Program for Dr Habibullah Saiyed

### 18-30 August 2008

<table>
<thead>
<tr>
<th>Date</th>
<th>Work details</th>
</tr>
</thead>
<tbody>
<tr>
<td>18th August 2008 (Monday)</td>
<td>Arrival to Maldives</td>
</tr>
</tbody>
</table>
| 18 August 2008 (Monday) | Meet with Ms. Aminath Rasheeda, Mr. Ibrahim Shaheem, Mr. Ahmed Khaleel, Ms. Geela Ali and Ms. Asma Ibrahim to brief on the visit Meeting with Dr Abdul Azeez (Deputy Minister MOH) and Dr Sheena (Executive Director General MOH)
Dr J M Luna WHO, Ms Laila Ali (WHO)
At DPH                                                                                                                                                  |
| 19 August 2008 (Tuesday) | Field visit to “Felivaru” (air taxi) - (sauda)
Visit to Maldives Industrial Fisheries Co.
Depart from “Felivaru” (air taxi)                                                                                                                                 |
| 20 August 2008 (Morning) | Visit to Sea Explorer Dive School                                                                                                                                                                          |
| 20 August 2008 (Afternoon) | Meeting with Ministry of Transport and Communication                                                                                                                                                       |
| 21 August 2008 (Thursday) | Visit to Thillafusi island
- Gas Filling Plant
- Cement Packing Plant
- Guarantee Fiberglass Boat Building
- Al-Shaali Fiberglass Boat Building                                                                                                                                 |
| 24 August       | Visit to Villingili island Various Construction sites                                                                                                                                                        |
| 25 August 2008 (Sunday) | Meeting with Ministry of Higher Education Employment and Social Security                                                                                                                                 |
|                 | Meeting with Ministry of Fisheries Agriculture and Marine Resources.                                                                                                                                          |
|                 | Meeting with Ministry of Environment                                                                                                                                                                        |
| 26 August 2008 (Tuesday) | Workshop on occupational health                                                                                                                                                                              |
| 27 August 2008 (Wednesday) | Debriefing WR                                                                                                                                                                                              |
| 28 August 2008 (Thursday) | Debriefing MoH
Visit to National Foods and Drug Laboratory (Male’)                                                                                                                                                     |
| 30 August 2008 (Saturday) | Departure                                                                                                                                                                                                    |
Annex 2 – Major Hazardous Occupations

Construction workers: Construction all over the world is considered to be most hazardous industry and is typically associated with highest incidence of fatal and nonfatal accidents. In 2006, 3691 local and 16,415 expatriate workers were employed in construction industry. The number of expatriate workers in this industry increased to about 28,000. Thus the majority of the workers are

![Construction work](image)

**Figure 1 Construction work.** A migrant worker in Villinigili grinding the wall. Note exposure to the dust clouds and absence of safety appliances like helmet, safety shoes and safety belt. Makes this worker especially prone to accident hazard and vulnerable to its consequences

The expatriate from Bangladesh, India, Nepal and Sri Lanka. The working and living conditions of these workers are far from satisfactory. The workers are exposed to chemicals (paints, solvents, glues, adhesives, pesticides etc), noise, UV radiation (sun and welding arcs), vibration. The most common fatal injuries among construction workers are falls, transportation accidents, contact with objects or equipment (e.g., struck by an object or caught in machinery or
materials) and exposure to harmful substances, most of which are electrocutions from contact with electrical wiring, overhead power lines or electrically powered machinery or hand tools. During visits of the construction site at Villingili it was observed that the workers that the workers did not use any protective equipment such as helmets, safety shoes or safety belt while working at height (see the picture) According to Employment Act 2007, reporting of any injury requiring medical attention is compulsory, however, this is hardly done because there is no punitive action for non-reporting.

**Glass fibre Boat Building:** In recent years there is an expansion in the boat building industry n Maldives. There are three boat building factories in Maldives each employing from 80 -100 workers in Thillafusi island. Inquiry with the boat builders revealed that the boat building work is carried out in many other islands (e.g. Huvdu atoll) is also carried out however, more details are not available.

![Figure 2 Fibre glass boat building –](image)

Note the work being carried out in confined spaces. The face mask is tied over the forehead by the worker.

The process of manufacturing Fiberglass Reinforced Plastic involves two main working stages. In the first stage called lamination, where layers of resin and glass fiber are built in molds, workers are heavily exposed to uncured resin, hardeners and glass fiber. In the second stage (post-lamination), which involves cutting, grinding, and assembling molded plastics to produce the final products; workers are mainly exposed to FRP dust. Most of the chemicals used by
workers in the manufacture of FRP products, UP resin, styrene, auxiliary agents and hardeners can cause both irritant and allergic contact dermatitis and nervous system depression. The work is typically carried out in confined spaces without ventilation or personal protection leading heavy exposure to various chemicals through inhalation and skin. (see figure 1)

Application of gel coat and other chemicals. Note working in confined space. Exposure to high levels of these chemicals for a prolonged periods can lead to severe damage to nervous system, kidney and liver, dermatitis and possibly cancer.

**Agriculture Workers:** In 2006, there were 4,236 local and 476 expatriate workers engaged in agriculture. Agricultural systems in Maldives consist of a mixture of traditional and new practices. One of the problems is to find an agricultural system that is both productive and sustainable. The limitations of the physical environment make that search difficult. The traditional agricultural systems are composed of settled home gardens and types of shifting cultivation. Home gardens are continuously replenished with household waste and leaf litter, preventing soil erosion from becoming a major problem. Only 10% of the land is arable. Soil pests and diseases, such as nematodes and *phytophthora* root rot, are serious threat to the productivity which might have been responsible for pesticides demand.

In addition to the traditional physical (extreme weather), biological and ergonomic occupational health problems, the Maldivian farmers are exposed to higher risk of hazardous
pesticide exposure due to lack of awareness and lesser control at import and user level. Available data suggest that in 2006, 862 MT of some 220 pesticides were imported, 20 of which belong to the WHO Class Ia and Ib (extremely/highly hazardous). 76 pesticides are potentially carcinogenic and/or endocrine disruptive (Category II-U). These pesticides are available in the open market without any restriction. It is anticipated that the farmers are exposed to a number of pesticides due to unregulated use. However, no data with regard to the use of these pesticides in agriculture and acute and chronic toxicity are available.

In view of the serious consequences of uncontrolled use of pesticides in agriculture leading health problems of the farmers and the consumers and government’s plan to promote agriculture in Maldives, the need for effective regulation can not be overemphasized.

Fisheries: Traditionally fishery is the main occupation and major livelihood of the Maldivians. It is also the second largest industry in the Maldives. The main methods of fishing are pole and line for skipjack tuna which is in practice since time immemorial. Although triangular sailed dhoni were used in the past, today fishing dhoanis are mechanized. Traditionally, the fishermen set out at dawn in search of bait fish, which were caught and kept alive in a specially prepared compartment of the dhoani. Eight or nine men did the actual fishing. The poles are short, are equipped with a line, and hook. Traditionally, the fishermen return to the island by nightfall however, with the advent of mechanized dhoani, they are back by early afternoon. The mechanisation of fishing vessels revolutionised the Maldivian fishing industry. It enabled the fisherman to travel much farther distances, than were possible when sailed boats were in use. It meant that the direction and speed of the wind were no longer determinants of the distances travelled by fishermen in search of fish. Establishment of cold storage facilities was another important landmark in the development of the fisheries industry.

Occupational health problem includes, exposure to extreme weather, accidents - (falling overboard when laying out the fishing gear, knife injuries while bleeding and cutting fish etc), skin diseases due to contact with fish proteins or use of rubber gloves, malignancies from prolonged exposure to ultraviolet light, cataract due to glare from sea surface, noise exposure in machine room personnel and psycho-social problems. The fisherman are also exposed to the risk of frostbite in large vessels containing freezers.
Fish Processing: Large scale fish processing is carried out by Maldives Industrial Fisheries Company (MIFCO) at Felivaru island. It employs over 7,000 workers. The plant has its own electricity generate, water desalination, ice making, can making, and water treatment plant. Fish processing consists of sorting, freezing, cutting and separating muscle and canning, and packing. Some varieties fish is smoked before packing. Most of the workers in the fish processing plant are migrant women workers from Sri Lanka and Nepal. They stay alone in the company provided accommodations.

The occupational health hazards includes ergonomic problems due to repeated moments, injuries, allergies from fish protein and rubber gloves, psychological problems due to isolation, accidents and exposure to high levels of noise can making plant. Exposure to smoke from solid fuels used for making smoked fish.

Occupational Diving: There are about 800 - 1,000 trained divers in Maldives. They are employed at resorts to as instructor to the recreational divers mostly foreign tourists. These divers are well equipped and trained are covered by safety precaution such as pairing (presence of another diver nearby for rescue of operation) and access to decompression chambers and modern treatment. There is another group of divers, called indigenous divers, who are engaged by the contractors for collection of sea cucumber, live fish etc. Ministry of tourism as declared this as illegal considering adverse impact on marine fauna and tourism. hey are paid up to about 1,000 Rf (80 USD) per day. These divers do not have any formal training. These divers do not observe safety precautions such as pairing and slow ascent etc.

Occupational Health Hazards: Diving is considered as one of the most hazardous and life threatening operation even for the professionals and recreational divers. A study in Japan (Nakayama et Emergency Med J (2003) 20:332-334) showed that the complications such as nitrogen narcosis (12%), barotraumas of ears (11%), barotraumas of nasal sinuses (5.6%) and decompression sickness (2%). The general occupational hazards of workplace including fire, electricity shocks and noise hazards during the process of gas tanks filling can occur in the
diving industry. However, there are number of specific physical health hazards which are limited to diving and are due to pressure changes.

The hazards during diving can be divided into three groups: (1) General hazards which can occur at any time during diving include drowning which may occur due to loss of air supply and inability of the diver to reach surface in time, salt water aspiration syndrome characterized by rigors, fever, nausea, headache and cough with copious sputum. Nitrogen narcosis is a common condition characterized by impaired judgment, sense of wellbeing and abnormal risk taking behaviour such as removal of breathing apparatus. (2) Problems of increasing pressure during descent include aerotitis and sinus pain due higher air pressure in middle ear and nasal sinuses to cause pain pressure. Air in dental can cause severe pain. (3) Increased air pressure in the lungs can cause rupture of the alveoli leading to emphysema or pneumothorax. Arterial gas embolism is the most serious complication of diving. The air bubbles formed by the undissolved nitrogen in the blood vessels lead to what is popularly known as decompression sickness characterised by following signs and symptoms:

Type I Decompression Sickness: Mild limb pains (“the niggles”), Severe limb pains (“the bends”), and Skin mottling and irritation (“the itches”)

Type II Decompression Sickness: (Neurological and Cardiorespiratory symptoms) Vomiting with or without abdominal pain, vertigo, tingling and numbness of limbs, paralysis or weakness of limbs, dyspnoea, severe headache, visual effects, flashes of light, double vision, blindness, angina, heart pain, irregular pulse collapse, coma and death

Dysbaric osteonecrosis—This is a condition affecting certain bones which may not become apparent on X-ray until several months after exposure. Disability may arise if joints are involved in the bone lesions and shoulders and hips are the most commonly affected.

**Automobile Repair Garages:** In recent years there is an exponential increase in the automobile vehicles parallel to the economic growth in Male’ leading to increase in the number of repair garages. These garages are situated within the residential areas and operate in very confined
space. The main processing carried out in these garages include repair work, spraying of paints, metal work etc. The workers are exposed to hazards like automobile exhaust (see figure..) containing highly toxic pollutants such as carbon monoxide, sulphur dioxide, oxides of nitrogen, lead, poly aromatic hydrocarbons etc. hydrocarbons etc. Exposure to other chemicals includes solvents and pigments from the paints and toxic chemicals used for degreasing and cleaning of metal parts.

Health care workers: Exposure to viruses, bacteria and fungal agents. Hepatitis B, HIV and tuberculosis are most important infections; stress, exposure to disinfectants and anesthetic chemicals, radiations.

Waste handlers: Injuries, exposure to infectious agents and chemicals.

Sewerage Workers: Exposure to carbon monoxide, k=methane and other toxic gases, infectious agents, drowning.

Port Workers: Injuries, ergonomic problems, exposure to hazardous chemicals
Annex 3 Proposed Health Act of Maldives - Article 8. Workers' Health

a. **In General.** Improving workers' health requires a comprehensive approach to protection and promotion of health at work including reduction and mitigation of occupational risks for health and safety, development of favourable physical and psycho-social work environment as well as healthy work-related behaviours.

b. **National Policy.** The ministry of health, together with other relevant ministries and in consultation with the organizations of workers and employers shall formulate, implement and periodically review a national policy and a plan of action on workers' health taking into account the relevant ILO Conventions and covering the following essential areas:

1. Assessment and management of occupational health risks
2. Monitoring and surveillance of workers' health
3. Workplace health promotion
4. Participation of workers and employers
5. Development of policies and institutional capacity for comprehensive planning and management in workers health at local and enterprise levels
6. Strengthening institutional capacities for regulation and enforcement in occupational health and safety
7. Evaluation and promotion of equitable access to workers health services
8. Human resources development and training in occupational medicine, occupational hygiene, and other relevant disciplines
9. Quality assurance in workers health services
10. Research in workers health
11. Reduction of the impact of industrial accidents and technological disasters on workers' health
c. **Healthy Workplaces.** The development of healthy workplaces shall be incorporated in the undertakings' internal policy and organizational goals, in which:

(1) Employers shall ensure the health and safety of workers in every aspect related to the work, including:

i. implementing measures for prevention of occupational risks to health and safety on the basis of the following general principles of prevention: avoiding risks; assessing risks which can not be avoided; replacing the dangerous, by non-dangerous or the less dangerous; adapting the work to the individual; giving priority to measures of collective protection over measures of personal protective; and providing appropriate instructions and education to workers in the achievement of adequate levels of health and safety, and

ii. providing preventive health services to all workers through designating competent personnel in the undertaking, or enlisting external services or persons without prejudice to the obligations under the previous paragraph.

(2) Workers shall take care of their own safety and health and that of other persons affected by their acts or omissions, including:

i. using correctly protective equipment and other safety devices, and

ii. cooperating with the employer and designated persons in achieving adequate levels of health and safety.

d. **Workers' Health Services.** All workers shall have access to appropriate health according to the specificity of their work and the nature of the occupational risks, as follows:

(1) Preventive health services at the workplace which provide professional advice, information and training of employers and workers on achieving adequate levels of occupational health and safety and organize health surveillance of workers and first aid measures
(2) Health care services for early detection, treatment and rehabilitation of occupational and work-related diseases and injuries.

e. **Occupational Diseases.** The ministry of health, in consultation with other relevant ministries and the organizations of workers and employers shall:

1. Develop, periodically review and update a list of occupational diseases subject to compulsory reporting by physicians and as appropriate to compensation.

2. Analyse periodically the status and the trends in workers health and occupational risks in the country.

3. Report annual statistics on occupational diseases to the appropriate international agency.

f. **Special Protection of Vulnerable Workers.** Workers which may be subject to exposure to occupational risks higher than the average because of their physical or social status or which may be more vulnerable than average workers to the effects of such exposures shall be provided with special protection measures. The ministry of health, in consultation with other relevant ministries and the organizations of workers and employers shall define the groups of workers which require special protection measures and develop programmes for putting such measures into practice, including (but not restricted to) elimination of hazardous child labour, protection of the health of pregnant women and workers in childbearing age, unorganized labour forces, migrant and seasonal workers."
Strategy for Injury prevention

2007-2008

A collaborative effort

Department of Public Health
Ministry of Health

January 2007
### Strategy 1: Advocacy

<table>
<thead>
<tr>
<th>Action</th>
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<th>Partners</th>
<th>Time line</th>
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<tr>
<td>Develop guidelines and regulations on construction site safety</td>
<td>MCPI, AGO</td>
<td>MM, MOH, PH, MPS, MOHA, MHESS</td>
<td>Draft by August 2007, final by December 2007</td>
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<td>Develop a legislation supporting health and safety Act</td>
<td>MOH, MCPI, AGO</td>
<td>MM, MOH/DPH, MPS</td>
<td>A draft by Dec 2007 and final by July 2008</td>
</tr>
<tr>
<td>Develop health and safety Act</td>
<td>MOH, AGO</td>
<td>MCPI, MOHA, MHESS, WHO Other relevant sectors</td>
<td>A draft by June 2008, final by Dec 2008, passed by parliament 2009.</td>
</tr>
<tr>
<td>Develop supervision mechanism for construction site</td>
<td>Male Municipality</td>
<td>MCPI, DPH, MHESS, MPS</td>
<td>Implemented by July 2007, ongoing there after.</td>
</tr>
<tr>
<td>Develop supervision mechanism for workplace safety</td>
<td>Male Municipality</td>
<td>MHESS, DPH, MPS</td>
<td>Implemented by July 2007, ongoing there after.</td>
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<tr>
<td>Involve public in decision making process (Traffic law and regulations)</td>
<td>MOTC</td>
<td>AGO, Male’ Municipality, DPH</td>
<td>At least one consultation held every year.</td>
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<td>Approach NGOs for attaching funding for programmes</td>
<td>MOTC, MOH</td>
<td>All the relevant ministries</td>
<td>Proposal for funding sent by August 2007</td>
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<tr>
<td>Advocate for government resource allocation from 2008</td>
<td>All the relevant ministries</td>
<td>Ministry of Finance</td>
<td>Ongoing</td>
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<tr>
<td>Sensitize Policy makers on injury prevention,</td>
<td>MOTC, MCPI, MHESS, MPS</td>
<td>DPH</td>
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## Strategy 2: - Capacity Building and Inter-sectoral Collaboration

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<td>Train health care providers and staff on fundamental knowledge and skills on injury prevention, including injury epidemiology, implementation of intervention programs and evaluation</td>
<td>MOH</td>
<td>DMS/DPH/IGMH/ADK..Ministry of Transport, MCI, MPS</td>
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<tr>
<td>Formalize national road safety commission/council/committee</td>
<td>MOTC, MPS, MOH</td>
<td>All the relevant Ministries</td>
<td>April 2007</td>
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<tr>
<td>Develop information sharing system injuries and deaths due to accidents and regular consultations with partners</td>
<td>MOH, MPS</td>
<td>IGMH, DMS, DPH, All relevant ministries.</td>
<td>Ongoing</td>
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<td>Designate focal points at the organizations and Ministries</td>
<td>All the relevant ministries</td>
<td>-</td>
<td>May 2007</td>
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<tr>
<td>Make links with other proms (e.g. Healthy settings/Island programme)</td>
<td>MOH, DPH</td>
<td>Ministry of Housing and Urban Development, MOTC</td>
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<td>Integrate and link injury prevention with school health program</td>
<td>EDC</td>
<td>DPH, MPS</td>
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<td>Train relevant personnel in management of injury surveillance system</td>
<td>MOH</td>
<td>IGMH, WHO, DMS (all hospitals), MPS</td>
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### Strategy 3: Prevention

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<td>Media coverage on all the serious injuries</td>
<td>Maldives Police Service Relevant Media Agencies</td>
<td>Ministry of Information</td>
<td>Ongoing</td>
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<tr>
<td>Develop and undertake, pedestrian awareness campaign</td>
<td>Maldives Police Service</td>
<td>DPH, Transport Ministry</td>
<td>Quarterly every year</td>
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<tr>
<td>Develop interventions targeted for Traffic Violators</td>
<td>Maldives Police Service</td>
<td>All the relevant ministries</td>
<td>Implement by Dec 2007</td>
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<tr>
<td>(Driving schools which provides opportunities for information, education and dangers of violating traffic rules) E.g. Singapore model</td>
<td></td>
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<tr>
<td>National awareness campaign on injury prevention (Including all means of media) - Target vulnerable groups - Use victims groups - Deliver evidence based messages</td>
<td>DPH</td>
<td>MPS, MOTC, MCPI, NGOS, MOE, Youth groups.</td>
<td>Oct 2007; annually</td>
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<tr>
<td>Develop and disseminate awareness materials for youth awareness</td>
<td>DPH</td>
<td>MPS, MOH, IGMH, WHO</td>
<td>June 2008</td>
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### Strategy 4: Surveillance

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<th>Time line</th>
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<td>Establish and maintain injury surveillance system in all atolls</td>
<td>DPH/DMS</td>
<td>IGMH, WHO, all Regional Atoll hospitals, ADK hospital, MPS</td>
<td>In all Grl 1 Hospitals by Dec 2007; Gr2 hospitals by Dec 2008; All hospitals by 2009</td>
</tr>
<tr>
<td>Initiate and monitor use of pilot surveillance form in Hdh, Seenu, Gn and L, Gn Fuvamulak</td>
<td>DPH/DMS</td>
<td>IGMH, hospitals, DPH</td>
<td>March 2007; ongoing quarterly</td>
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<tr>
<td>Developing guidelines for data collection and surveillance</td>
<td>DPH/IGMH</td>
<td>DMS, all hospitals, MPS</td>
<td>June 2007</td>
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<tr>
<td>Undertake a national study on impact of injuries</td>
<td>MOH</td>
<td>MPS, Min of Transport, WHO, NGOs</td>
<td>Dec 2008.</td>
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**Abbreviations:**
AGO - Attorney General Office  
DPH - Department of Public Health  
IGMH - Indira Gandhi Memorial Hospital  
MCPI - Ministry of Construction and Public Infrastructure  
MHESS – Ministry of Higher Education and Social Security  
MM - Male’ Municipality  
MOE - Ministry of Education  
MOH - Ministry of Health  
MOHA – Ministry of Higher Education  
MOI - Ministry of Information  
MOS - Male’ Police Services  
MOTC - Ministry of Transport and Communication  
NGOs - Non-governmental Organizations
Annex 5

Report of the Stake Holders’ Workshop on Occupational Health in Maldives

STELCO Conference Room Male’ – 26th August 2008

WHO Office for South-East Asia, New Delhi
Report of the Stake Holders’ Workshop on Occupational Health in Maldives
STELCO Conference Room Male’ – 26th August 2008.

Stake Holders’ Workshop on Occupational Health in Maldives was held on 26th August 2008 at STELCO conference room, Male’. The objectives of this workshop were as follows:

4. To appraise and discuss the findings/observations of OEH/SEARO on Occupational Health Profile – Maldives
5. To identify -
   a. important hazardous occupations
   b. regulatory and non-regulatory mechanisms and
   c. challenges related to workers’ health in Maldives
6. To recommend action to meet the challenges

Participants:
The participants included representatives from Department of Public Health, Min. of Higher Education, Employment and Social Security, Min. of Tourism and Civil Aviation, Min. of Fisheries, Agriculture & Marine Resource, Maldives Police Service, Min. of Environment, Energy & Water, WHO, Maldivian Medical Association, Maldivian Nurses Association and representatives of the employers of the construction industries, diving school, Maldives ports etc. For complete list please see annex 5A.
The workshop consisted of inaugural function, presentation by expert, group discussion and closing session. For complete agenda see annex 5B.

Inaugural Function:
Dr Jorge M Luna, WHO representative to Maldives and Dr Sheena Moosa, Director General, Health Services were chief guests at the inaugural function and delivered appropriate speeches.

Technical Session:
Following inaugural session, Dr Habibullah Saiyed, OEH/SDE, WHO –SEARO made a presentation entitled “Occupational health problems and preventive action”. His talk consisted of general introduction to the occupational health and work-related hazards followed by addressing specific occupational health problems in Maldives his analysis of occupational health situation in Maldives, areas of serious concern and suggested plan for action.

Group Discussion.
The participants were divided into three groups. Each group was asked to discuss following topics with respect to workers’ health in Maldives:

1. What are the important occupations? Prioritize them on the basis of severity of hazards, number of people employed and possibility of successful intervention. List five most important occupations.
2. What should be the regulatory mechanisms to protect health and safety of the workers?
3. What should be the non-regulatory mechanisms to protect health and safety of the workers?
4. The duties of employers.
5. Challenges in enacting and implementation of occupational health and safety regulations.
6. Recommendations to meet challenges.

Summary of the group discussions is as follows:

Conclusions:
- Several hazardous occupations exist in Maldives which include construction work, agriculture, fibre glass boat building, occupational diving, fishing and fish processing, health care work, automobile garages, carpentry and repair shops, air and sea port, hotel and restaurant work etc. These occupations contribute significantly to the economy of Maldives and give employment to a large number of local and expatriate workers.
- The major challenges are -
  - lack of data on the incidence of work related injuries and diseases.
  - no formal mechanisms for monitoring health and safety of the workers.
  - lack of awareness amongst the stakeholders at all levels.
  - lack of coordination between the ministries and conflict of interest
  - inadequate resources including trained manpower
  - existence of hazardous factories/workshops within residential areas
  - no rights for the workers and lack of labour organization.

Recommendations
- Establish policy, create standards and produce safe practice guidelines for hazardous occupations.
- Enact regulatory mechanisms for safety inspection system, the employment injury compensation system (e.g., recording of injuries and diseases), of the Occupational health and safety activities at workplaces (e.g., safety committees), and of the occupational health services.
- Allocate adequate funds and strengthen national capacities for regulatory and monitoring mechanisms.
- Regulations should include standards, compulsory disclosure of hazard information to the workers, pre-employment and periodic medical examinations, health insurance for all workers, notification of work related injuries and diseases to appropriate authors and provisions for adequate compensation and penalties.
- Establish adequate mechanisms for intersectoral co-ordination and monitoring.
- The non-regulatory mechanisms should include awareness building, national level recognition for good practices through awards; encourage industry to acquire international certification on occupational health and safety such ISO 18001 etc; ensure health insurance and good working and living conditions for all the workers.
Annex 5A  

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<td>1</td>
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<td>Mr. Hussain Nizam</td>
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<tr>
<td>14</td>
<td>Mr. Abdulla Saeed</td>
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<td>Dr. Sheena Moosa</td>
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<td><a href="mailto:sheena@health.gov.mv">sheena@health.gov.mv</a></td>
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<td>25</td>
<td>Dr. Jorge Mario Luna</td>
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Annex 5B

Agenda for the Stake holders workshop on Occupational Health in Maldives,
STELCO Conference Room, Male’ – 26th August 2008

8:30 – 9:00 AM  Registration

9:00 – 9:30 AM  Inaugural Function
   Recital of the Holy Quran
   Inaugural speech – Dr J M Luna WHO Representative
to Maldives
   Key note address - Dr Sheena Moosa Director General,
   Health Services
   Introduction to the workshop Dr Habibullah Saiyed
   OEH/SEARO, WHO

9:30 – 9:45 AM  Tea/ Coffee Break

9:45– 10:00 AM  Introduction of the participants
10:00 – 11:00 AM  Occupational health problems and preventive action
   Dr Habibullah Saiyed
11:00 – 11:15 AM  Introduction to group work and formation of groups
11:15 AM – 12:30 PM  Group Discussions

12:30 – 1:30 PM  Lunch

1:30 – 2:30 PM  Group Discussion (continues...)
2:30 – 3:30 PM  Presentation by the groups and discussions
3:30 – 4:30 PM  Closing session - Tea
Annex 6 Documents Consulted

2. 11 Health Questions about 11 SEAR countries, Report WHO Regional Office for South East Asia, 2007.
7. Maldives - Wikipedia, the free encyclopedia