REVIEW OF THE STATE OF WORLD FISHERY RESOURCES:
INLAND FISHERIES
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This document represents the first revision of Fisheries Circular 942, and is a key document in the FAO Fishery Department's efforts to provide accurate and timely information on fishery resources. Numerous contributors are responsible for the production of this Circular. The various sections of this document have been produced by the authors or groups indicated in the appropriate sections. Dr José Aguilar-Manjarrez, Fishery Resources Officer (Inland Fisheries GIS) prepared the maps and Ms Adele Crispoldi, Senior Fishery Statistician and FIDI staff provided breakdowns of statistical data for Chapter 1, "Overview of Inland Fisheries". The capture fishery and aquaculture production data are from the FAO Fisheries Department, and were extracted using FISHSTAT+. The data sets were Aquaculture Production: Quantities 1950 to 2001, and Capture Production 1950-2001. The data are available at: http://www.fao.org/fi/statist/FISOFK/FISHPLUS.asp#DownloadData

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A floppy disk containing the figures presented in this circular is available at the end of the document for better understanding. These figures may be used for other publications provided that the source (FAO) is cited.

Comments on this document are welcome and should be directed to Chief, Inland Water Resources and Aquaculture Service, Viale Delle Terme di Caracalla, 00100 Rome or through FI-inquiries@fao.org.
ABSTRACT

The objective of this review is to present a broad view of the state of inland capture fisheries as of 2001. Status and trends, are reported along with coverage of selected sections on the impacts of dams on fisheries, fisheries in rice-based ecosystems, database on African water resources, indices of human development and environmental sustainability, and new approaches to improving inland fishery information.

Inland capture fisheries production was reported to FAO by 150 countries with total production of 8.7 million tonnes in 2001. Inland capture fisheries accounted for 6.1 percent of the global total capture fisheries and aquaculture production. The 15-year (1986–2001) trend in production is mainly positive with 109 of the 150 countries maintaining stable or increasing outputs; 81 percent of the production was from these countries where capture fisheries is stable or slowly increasing.

By continent, inland capture fisheries production was 5.8 million tonnes from Asia; 2.1 million tonnes from Africa; 0.3 million tonnes from Europe and South America each; 0.2 million tonnes from North America; and 22 thousand tonnes from Oceania. Twenty countries accounted for 84 percent of the total global inland capture fisheries production with the top producers being China (2.1 million tonnes), India (1.0 million tonnes), and Bangladesh (0.7 million tonnes). Based on production per se, most of the important inland fisheries countries are in Asia and Africa.

Inland capture fisheries are an important source of animal protein. In seven countries inland fisheries provided the only source of fish, in 20 additional countries they accounted for 81 to 99 percent of total fish production from all sources, in four countries they accounted for 61 to 80 percent of total production from the aquatic sector. Seventy one Low-Income Food-Deficit countries produce 80 percent, nearly 7 million tonnes, of the world total inland capture fisheries output. In 27 of the LIFD countries inland capture fisheries are the sole source of fish, and in an additional 22 countries they account for at least 81 percent of the total inland fish production. In an additional three countries inland capture fisheries makes up at least 61 percent of inland production.

The Human Development Index (HDI) measures a country’s achievements in three aspects of human development: longevity, knowledge, and a decent standard of living. In 33 countries with low HDI’s, inland capture fisheries are the sole source of inland fish in 16, and account for at least 81 percent of inland fish production in an additional 14 countries. Inland capture fisheries production is very important in the fish supply of nearly all of the countries with low HDI’s. A threat to the sustainability of inland fisheries is degradation of the environment.

The Environmental Sustainability Index (ESI) is a measure of overall progress towards environmental sustainability that has been developed for 142 countries of which 133 reported inland capture fisheries production. Globally, 94 of the inland capture fisheries countries have ES indices that range from moderate to high, while there are only 39 that range from moderately low to low. Thirty-four (59 percent) of the countries that are highly dependent (i.e. inland fisheries provide at least 81 percent of the total fish supply) on inland fish production for their fish supply have at least a moderate ES index. Of potential concern are the inland fisheries countries for which the ESI ranges from moderately low to low and for which the 15-year trend in production is slowly or moderately decreasing; ten countries fall into this category.
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1 OVERVIEW OF INLAND CAPTURE FISHERIES

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1.1 Introduction

Overview and Objectives

This review deals with inland capture fisheries for food production. Although increasingly important in many areas, there is no systematic reporting of recreational fisheries to the FAO or to any other organization with global scope.

The objectives of this review are:

- to update and expand the scope of the 1999 version of the REVIEW OF THE STATE OF WORLD FISHERY RESOURCES: INLAND FISHERIES (FAO, 1999);
- to place inland capture fisheries in its proper context in relation to world fish production;
- to review the status and trends of inland fisheries production at global, continental and country levels;
- to call attention to the importance of inland capture fisheries with respect to food security and human development;
- to examine environmental sustainability in the context of the aquatic environments in which fishery resources reside and fisheries operate; and
- to call attention to the main issues facing inland fisheries.

The present version differs from earlier versions of Circular 942 in the following ways:

- The place of inland capture fisheries in the global production of aquatic food products is expanded to highlight countries where inland capture fisheries production is important relative to other aquatic production sectors.
- Updating of FAO statistical information is through 2001; recent analysis by FAO allows trends to be viewed from 1950; the data have been presented in environmental and capture fisheries-culture combinations.
- Colour maps have been added to illustrate better the country level geographic distribution of important characteristics of inland fisheries, and charts are in colour for better discrimination of comparisons.
- Indicators of the importance of inland capture fisheries production have been added including:
  - Per capita production.
  - Production per unit area.
  - Fifteen-year trends.
  - Environmental Sustainability Index.
  - Human Development Index.
1.2 The place of inland fisheries in world fish production – inland capture fisheries relative to marine capture fisheries and aquaculture

This section reviews trends and status of inland capture fisheries production in relation to aquatic production from marine capture fisheries and aquaculture.

Trends 1950 to 2001

Evolution of capture fisheries and culture in global time series

World total inland capture fisheries production reported to FAO reached 8.7 million tonnes in 2001, down slightly from 8.8 million tonnes in 2000. It is important to note at the outset that actual catches overall may be at least twice the quantities reported to FAO, and for some countries underreporting could be even greater (FAO, 1999).

Inland capture fisheries accounted for 6.1 percent of the total (capture fisheries and culture) global production. This compares with 59.8 percent (85 million tonnes) from marine capture fisheries of which about 31 million tonnes were used for reduction to meal and other non-food purposes and 34.1 percent (48.4 million tonnes) from aquaculture, including plants and animals (Figure 1.2.1). Long-term trends, from 1950 to the present, show increases for all three categories; however, production from marine capture fisheries has leveled off in recent years while aquaculture has rapidly increased. In contrast, production from inland capture fisheries has exhibited a modest, but steady increase (Figure 1.2.1).

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1 Inland fisheries are “fisheries which are carried out in freshwater or estuaries and whose target species are those that spend all or part of their life-cycle therein”. FAO Inland Water Resources and Aquaculture Service, Fishery Resources and Environment Division. 1992. Review of the state of world fishery resources. Part 2: Inland fisheries and aquaculture. FAO Fisheries Circular (FAO), no. 710 (rev.8). Rome, FAO. 26 pp.

2 The capture fishery and aquaculture production data are from the FAO Fisheries Department, and were extracted using FISHSTAT+. The data sets were Aquaculture Production: Quantities 1950 to 2001, and Capture Production 1950-2001. The data are available at: http://www.fao.org/fi/statist/FISIOFT/FISHPLUS.asp?DownloadData.
Trends in global capture fisheries and culture by environment

Over the last half century the relatively modest growth of inland and marine capture fisheries is evident with overall increases approaching five fold in that period. This contrasts with the rapid growth of aquaculture in recent times; freshwater culture, mariculture, and brackishwater culture have increased nine fold, six fold, and five fold, respectively, since 1980 (Figure 1.2.2).

Figure 1.2.2: Evolution of capture fisheries and aquaculture production by environment 1950–2001

Trends in capture fisheries and culture from inland waters – inland capture fisheries and freshwater and brackishwater aquaculture 1950–2001

Considering fish production from all sources in the inland environment calls attention to the increasing use of inland waters for culture as well as for capture fisheries. This is evident in the 52-year trends for inland capture fisheries, freshwater culture and brackishwater culture (Figure 1.2.3).

Figure 1.2.3: Production from inland waters – evolution of inland capture fisheries, freshwater and brackish-water culture 1950–2001
This is particularly true where brackishwater and freshwater culture are extensive. At the level of small individual water bodies, and at the level of parts of larger water bodies, it is well known that there is competition between inland fisheries and aquaculture for space and for access with social and economic consequences.

**Status 2001**

**Global view of the importance of inland fisheries relative to marine capture fisheries and aquaculture in 2001**

Two hundred twenty five countries reported fish production in 2001, of which, 150 reported inland capture fisheries production. This compares with 187 countries reporting marine capture fisheries production, and 164 countries reporting aquaculture production.

Among the 150 countries reporting inland capture fisheries statistics there were seven in which inland fisheries provided the only source of fish, and 20 additional countries in which inland capture fisheries could be considered extremely important, accounting for 81 to 99 percent of total fish production from all sources within the country. There were four additional countries in which inland capture fisheries could be said to be very important, accounting for 61 to 80 percent of total aquatic production (Map 1). These 31 countries together produced 1.8 million tonnes of inland fish equivalent to 20 percent of total inland capture fisheries production.

*Map 1: Percent of total fish production from inland capture fisheries*

**Global view of the role of China in fisheries and aquaculture**

China dominates among the major categories of global aquatic production (Figure 1.2.4). Therefore, China is considered separately herein.
The situation is particularly marked in the case of global mariculture and freshwater aquaculture for which China accounted for 74 percent and 73 percent, respectively, in 2001. In comparison, China accounted for 17 percent of marine capture fisheries production, 25 percent of inland capture fisheries production, and 13 percent of brackishwater culture in 2001 (Figure 1.2.4).

Continental view of capture fisheries and culture production by environment in 2001

Asia dominates production both from capture fisheries and culture viewpoints (Figure 1.2.5). Inland capture fisheries production from Asia was 5.8 million tonnes; Africa ranked second with 2.1 million tonnes. Inland capture fisheries production from Europe and South America was 0.3 million tonnes,
each, and in North America 0.2 million tonnes. Inland capture fisheries from Oceania produced 22 thousand tonnes in 2001.

In Asia, China dominates fish production accounting for 83 percent of mariculture, 78 percent of freshwater culture, 37 percent each of marine and inland capture fisheries, and 17 percent of brackishwater culture (Figure 1.2.6).

![Figure 1.2.6: The place of China in fish production in Asia in 2001](image)

**Fish production from inland waters – inland capture fisheries and freshwater and brackishwater aquaculture production**

In inland waters fish and other other aquatic animal production can come from capture fisheries, or from brackishwater or freshwater aquaculture. It is important to partition production from inland capture fisheries from production from inland aquaculture because the former is potentially the most immediate source of high quality protein for the populace. Much of inland capture fisheries production is available for consumption domestically whereas at least part of inland aquaculture production is for export, or too expensive to be available to the low-income stratum of the population.

There were 32 countries among the 150 inland fisheries countries with production from inland capture fisheries as the sole source of fish from inland waters. Additionally, there were 34 other countries in which inland capture fisheries were extremely important, accounting for at least 81 to 99 percent of the freshwater and brackishwater production from all sources, and an additional ten countries where inland capture fisheries were very important, accounting for at least 61 to 80 percent of total inland fish production (Map 2). These 76 countries produced 3.0 million tonnes in 2001, equivalent to 35 percent of the total inland capture fisheries output.
1.3 Comparative evaluation of inland fisheries – the importance of production from inland fisheries at the country level

In this section the importance of inland capture fisheries at the country level is considered from several viewpoints:

1. Production *per se*.
2. Production per capita.
3. Production per unit area.

**Importance based on inland capture fisheries production**

In 2001, inland capture fisheries production reached 2.1 million tonnes in China, approximately one million tonnes in India, and 0.7 million tonnes in Bangladesh. The remaining countries among the top 20 produced from 360 000 tonnes down to 92 000 tonnes (Figure 1.3.1).

The top 20 countries account for 84 percent of the total global inland capture fisheries production. Most of the important inland fisheries countries are in Asia (10) and Africa (7) (Map 3).
Figure 1.3.1: Top 20 countries in inland capture fisheries production in 2001

Map 3: Inland capture fisheries production by country in 2001
Inland fisheries, the fish food supply and food security – importance relative to production per capita

Here it is assumed that all aquatic products from inland fisheries are consumed in-country, or in neighbouring countries. This is likely true for most countries, but an important exception is the export of Nile perch to Europe from Lake Victoria in Africa. Nevertheless, inland capture fisheries production divided by population is taken as an indication of the fish per capita supply from inland capture fisheries.

Cambodia is the preeminent country in per capita inland capture fisheries production with 28.2 kg, exceeding that of the second ranking country, Chad, by a factor of more than three (Figure 1.3.2). Apart from Cambodia, per capita inland production ranges from 9.7 to 3.3 kg among the other 19 countries in the top 20.

As a comparison with the weighted mean\(^4\) per capita inland capture fisheries production of 3.9 kg, the per capita fish supply from all sources in 2001 was 13.1 kg (excluding China), and the overall fish supply from aquaculture was 2.4 kg.\(^5\) However, in the low-income food-deficit countries, 71 of which are countries reporting inland fisheries production, the per capita fish supply is 8.3 kg, excluding China\(^6\).

Globally, most inland capture fisheries countries have per capita inland capture fisheries values of less than 2.5 kg per person (Map 4).

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\(^4\) Weighted by inland production in each country. The unweighted mean is 1.5 kg.

\(^5\) Overview of fish production, utilization, consumption and trade by STEFANIA VANNUCCINI, Fishery Statistician (Commodities), FAO, Fishery Information, Data and Statistics Unit: http://www.globefish.org/presentations/2001%20Fishery%20Overview/2001fisheryoverview.htm

Comparing per capita inland capture fisheries production (Figure 1.3.2) with production per se (Figure 1.3.1) reveals that there are nine countries that are included in the top 20 in both categories: in Asia-Bangladesh, Cambodia, and Myanmar, in Africa-Egypt, the United Republic of Tanzania, Uganda, Democratic Republic of the Congo, Kenya and Mali. Considering production per capita shifts the focus of continental importance from Asia to Africa. Among the top 20 countries production-wise, ten countries were in Asia and seven in Africa. In contrast, the top 20 in per capita inland capture fisheries include 13 from Africa and only four from Asia. Thus, the importance of both production in its own right, and production per capita is emphasized for the nine countries in common among the top 20, and for the others, emphasis is shifted from Asia to Africa in terms of the apparent important contribution of inland capture fisheries to the national fish food supply. Inland capture fisheries are particularly important in African land locked countries because of the relatively low levels of aquaculture production there.

**Importance of inland capture fisheries production relative to land area**

Inland capture fisheries production per unit area of a country (tonnes/km²) is an alternative to production alone as an indication of the importance of inland fisheries in a country. For example, Bangladesh (4.7 tonnes/km²), Cambodia (2.0 tonnes/km²) and Uganda (0.9 tonnes/km²) stand out among the top 20 countries in inland capture fisheries production per unit area while the remaining 17 range from 0.5 to 0.2 tonnes/km² (Fig. 1.3.3). Production per unit of area brings out the importance of inland fisheries in relatively small countries such as Fiji, Benin, Burundi and Rwanda (Figure 1.3.3). A better measure of the importance of inland capture production relative to area would be production per unit of water surface area. However, water surface data are not comprehensively and comparatively available for many inland fisheries countries.

**Inland fisheries in low-income food-deficit countries**

The classification of a country as low-income food-deficit (LIFDC), used for analytical purposes by FAO, is traditionally determined by four criteria. First, a country should have a per capita income below the "historical" ceiling used by the World Bank to determine eligibility for International Development
Association (IDA) assistance and for 20-year International Bank for Reconstruction and Development (IBRD) terms. The second criterion is based on the net food trade position of a country (i.e. gross imports less gross exports) averaged over the preceding three years. Thirdly the self-exclusion criterion is applied when countries that meet the above two criteria specifically request to be excluded from the LIFDC category. In order to avoid countries changing their LIFDC status too frequently – typically reflecting short-term, exogenous shocks – a "persistence of position" is considered which would postpone the "exit" of a LIFDC from the list, despite the country not meeting the LIFDC income criterion or the food-deficit criterion, until the change in its status is verified for three consecutive years.

Of the 150 inland capture fisheries countries there are 71 that are LIFD countries (Map 5). The LIFD countries produce 80 percent, nearly 7 million tonnes, of the world total inland capture fisheries output. These totals are heavily influenced by China. China alone as an LIFD country accounts for 31 percent (2.1 million tonnes) of the total LIFDC inland capture fisheries production. All but four of the top twenty countries in inland capture fisheries production and in inland production per capita in 2001 are LIFD countries.

Among 27 of the LIFD countries inland capture fisheries are the sole source of fish, and in an additional 22 countries inland capture fisheries account for at least 81 percent of the total inland fish production. In an additional three countries inland capture fisheries make up at least 61 percent of inland production. In LIFD countries the contribution of fish to total animal protein intake is nearly 20 percent. Therefore, sustaining inland capture fisheries production in most of the LIFD countries should be an important food security goal.

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1.4 Status and trends of inland capture fisheries production

Trends\(^9\) in inland capture fisheries production at country level

Although 52-year trends are available for all inland fisheries countries, trends for the most recent 15-year period have been used. Interest should be focused on recent performance, and a 15-year period is sufficient to capture positive and negative effects of varying water quantities on production in terms of lake and river volumes, and in terms of varying inundation of floodplains and other fished shallow water surfaces. It also is a period sufficiently long in which the effects of varying fishing pressure on resources would become evident. Thus, the 15-year trends are an indication of the status of resources as affected by environment and fishing together as revealed by annual production data.

Considering the 15-year (1986–2001) trends in inland capture fisheries production grouped by the numbers of inland capture fisheries countries in each trend category\(^{10}\), it can be seen that about half are relatively stable in capture production, about 17 percent are slowly increasing, and about 20 percent are slowly decreasing in production (Figure 1.4.1).

Relatively few countries are moderately or rapidly increasing in inland capture fisheries, and no countries are rapidly decreasing (Map 6).

Thus, in terms of numbers of countries in each trend category, the global picture is a relatively positive one with 109 of the 150 countries maintaining stable or better outputs.

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\(^9\) Trend values generated by FISHSTAT+ can range from +1 (rapid increase) to -1 (rapid decrease) while values at or near zero indicate relative stability.

\(^{10}\) Trend values for the 150 inland fisheries countries range from 0.81 to -0.46. Trend values were cast into ranges of 20 units each with the mid range centred on zero (-0.09 to 0.09) and taken as being indicative of stable conditions in inland fisheries output. The other 20-unit ranges were categorized in a logical positive and negative progression that can be viewed as the legend to map 6, and the frequency distributions of the values in each range are evident in Figure 1.4.1.
Figure 1.4.1: Trends in inland capture fisheries production (1987-2001): percent of 150 countries

Map 6: Trends in inland capture fisheries production 1986-2001
Considering the 15-year trends, this time grouped by the quantities of production contributed by the countries in each trend category, it can be seen that countries with stable trends contribute about 35 percent of the total inland production while countries with slowly increasing production contribute about 56 percent of the total (Figure 1.4.2). Little of the production is in countries where production is moderately or rapidly increasing or decreasing.

Thus, in terms of the share of production in each trend category, the picture is positive with 81 percent of the production falling into categories where capture is stable or slowly increasing.

**Figure 1.4.2: Trends in inland capture fisheries 1987-2001 – percentage share of production in 2001**

<table>
<thead>
<tr>
<th>Trend</th>
<th>Percentage Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid Increase</td>
<td>0%</td>
</tr>
<tr>
<td>Moderate Increase</td>
<td>0%</td>
</tr>
<tr>
<td>Slow Increase</td>
<td>50%</td>
</tr>
<tr>
<td>Stable</td>
<td>30%</td>
</tr>
<tr>
<td>Slow Decrease</td>
<td>5%</td>
</tr>
<tr>
<td>Moderate Decrease</td>
<td>0%</td>
</tr>
</tbody>
</table>

**Identifying the catch – status of the identification of organisms from inland capture fisheries in 2000, and trends from 1980 to 2000**

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Identification of the organisms in the catch to species level is valuable for the management of fisheries as well as for fishery resource and economic assessments. Not only is the information of use internally in a country, but also for comparative purposes among countries that share river and lake basins, particularly to monitor the status of migratory fishes, other shared resources, and introduced and invasive species.

The objective of this section is to assess the extent to which countries with inland fisheries identify and report organisms in the catch. The assessment is in two parts: the situation in 2000, and trends in reporting from 1980 to 2000 in five year increments. Although data are available for 2001, it was decided to use 2000 as the most recent year so as to avoid bias from countries that report inland capture late.
The approach was to calculate an “organism identification score” for each country for each selected year. The score is based on two criteria: (1) the level of detail of reporting, and (2) the importance of the organisms reported at a given level as indicated by the percentage of the total tonnage caught.

Taxonomic coding of the information provided to FAO by each country allows five levels of reporting to be identified: Level 5: Species; Level 4: Genus; Level 3: Family; Level 2: Order, or other taxonomic level (better identified, e.g. Cypriniformes); and Level 1: Order, or other taxonomic level (less well identified, e.g., Miscellaneous fishes). For this evaluation, a point system was used that "rewards" reporting at the most detailed level. For example, five points were assigned to Level 5 for reporting at the species level and one point assigned for reporting at the least detailed level of identification, Level 1.

**Status 2000**

There were 149 countries with inland fisheries production in 2000 for which the organism identification scores were calculated. About one-third of the countries scored 20, the lowest possible score, indicating that they reported their inland production only at the least detailed level of identification. There were an additional 23 countries with relatively low scores (i.e. scores <50) (Figure 1.4.3; Map 7).

In contrast, there were ten countries that achieved the highest possible score, and an additional 24 countries with relatively high organism identification scores (i.e. score 79 to 99). Finally, the remainder, 35 countries, did moderately well overall at organism identification (scores 50 to 79).

Kenya is an example of a country that scored relatively highly in 2000 with a score of 96. Kenya reported 15 separately identified groups of organisms of which five were identified to the species level. Those identified to the species level accounted for 85 percent of the total production and those identified to Level 4 (genus) accounted for an additional 13 percent of the total production. Thus, the high score was due to identifying nearly all of the production to species and genus levels.
**Trends in Organism Identification**

Given the importance of organism identification, an important question is the extent to which reporting in this regard is improving. Trends in organism identification were indicated by a calculation of the slope of linear regression line through the scores for the time period. The slope gives a measure of the rate of change in the score and thus provides an indication of the trend in species identification. If scores were available at five year intervals for 1980 to 2000, these were the years used to calculate the regression line making a maximum of five data points in all. For some countries where data for the earlier years were not available, the regression line was calculated for the scores between 1985 and 2000. In all, there were 136 countries for which the trends analysis could be carried out.

The resulting slopes were cast into five categories broadly indicative of the trends: marked improvement (21 percent), moderate improvement (23 percent), no change (36 percent), moderate deterioration (13 percent), and marked deterioration (7 percent)\(^{11}\) (Figure 1.4.4; Map 8).

Among those exhibiting no change were 37 countries (27 percent) with scores of 20 indicating that they have continued to report inland production at the least detailed level without any improvement, most of them for the entire period.

As an example, Kenya, with scores of 68, 93, 89, 98 and 96 for 1980, 1985, 1990, 1995 and 2000, respectively, is a country that falls into the lower portion of the “Marked Improvement” category.

That 59 (44 percent) of the countries exhibit a trend for improvement in organism identification is quite positive, but, overall, there is still much room for improvement in organism identification especially as regards those 37 countries (27 percent) that continue to identify the catch at the least detailed level.

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\(^{11}\) Marked Improvement, 0.010 < Slope < 0.043; Moderate Improvement, 0.001 < Slope < 0.010; No Change, Slope = 0; Moderate Deterioration, -0.001 < Slope < -0.010; Marked Deterioration, -0.010 < Slope < -0.031.
Figure 1.4.4: Frequency distribution of trends in organism identification among 136 inland fisheries countries 1980 to 2000

Map 8: Trends in organism identification among 136 inland fisheries countries 1980 to 2000
The most important species and groups in inland fisheries production

The most important species and groups in inland production have been aggregated to provide a global overview (Figure 1.4.5), and views by continents (Figure 1.4.6 to Figure 1.4.11). Globally, only two species, the Nile perch and the Nile tilapia, can be distinguished among the top ten species and groups in production. This is because the remainder is “not elsewhere indicated” (NEI) indicating that many countries have not reported their capture to the species level. Among the NEI groups, tilapias, cyprinids, freshwater siluroids, characins and snakeheads are important. Invertebrates, unidentified mollusks and crustaceans, figure importantly in the world inland catch.

At the species level Hilsha shad and Kelee shad are among the top identified species in Asia. The tilapias as a group, introduced widely, also figure importantly (Figure 1.4.6). In Africa, Nile perch, Nile tilapia, silver cyprinid, mudfish, and North African catfish are important at the species level (Figure 1.4.7). In South America, two species, the netted prochilod and the cachama, are identified (Figure 1.4.8). In North America, common carp, walleye, and pond smelt are among the important species in temperate and colder regions while the blue tilapia is important in the warmer waters (Figure 1.4.9). Europe has seven species identified as important, the leading ones being the Azov Sea sprat and the freshwater bream (Figure 1.4.10). In Oceania, three species are identified among the top ten of which is the Mozambique tilapia, an introduced species, the barramundi, and the short-finned eel (Figure 1.4.11).
Figure 1.4.6: Asia – most important species and groups 2001

Figure 1.4.7: Africa – most important species and groups 2001
Figure 1.4.10: Europe – most important species and groups 2001

Figure 1.4.11: Oceania – most important species and groups 2001