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# ROLE OF FISHERIES AND OTHER AQUATIC ANIMALS IN NUTRITION SECURITY

Fish and rice are essential elements in food security for Cambodia and the Mekong region. There is growingawareness of the role these natural resources play in people's livelihoods and of the likely impact that forces of change will have on these resources.

A series of scientific studies conducted to date confirm the importance of aquatic resources for the livelihoods, poverty reduction and economic development in Cambodia. Among them is the recent study conducted by the Inland Fisheries Research and Development Institute (IFReDI 2012) on food and nutrition security and on vulnerability to mainstream hydropower dam development in Cambodia. The study assessed i) the food consumption in rural households nationwide, and ii) likely impacts of Cambodian mainstream dams on fish yields, fish consumption and food security in Cambodia.

Consistent with other studies, the IFReDI (2012) study confirms the critical importance of aquatic resources, particularly fish, to the food and nutrition security of Cambodian people. The study found fish and aquatic resources provide 76% of animal intake, 37% of protein intake, 37% of iron intake, and 28% of the fats intake to the Cambodian population. The fisheries sector is therefore a crucial source of energy, protein and iron for people in Cambodia.

### FACTS AND FIGURES ON THE CONTRIBUTION OF FISHERIES

- The Cambodian diet is a combination of rice, fish and vegetables. After rice, aquatic resources are the second largest dietary component at about 18% of the total food intake.
- Inland fish consumption amounts to 40.3 kg/person/year, marine fish 16.2 kg/person/year, and aquaculture only 2% with 1.35 kg/person/year.
- Based on fish consumption figures, the annual yield of inland fish amounts to 570,000 tonnes, rising to 625,000 tonnes when other aquatic animals are included. Long distance migratory fishes (i.e. white fish such as *Henicorhynchus* mud carps, or trey riel,

andPangasius catfishes, or trey pra) represent 25% of the total fish catch; this fish group is very sensitive to dam development due to blockage of migration routes.

- The economic value (first sale value) of freshwater fish and aquatic products is estimated at US\$1 billion (\$1.6/kg). Including all multipliers (value added, export, occupation etc.), the fishery is worth several times more than this figure and its replacement value would also be far higher.
- Inland fisheries are important in terms of both nutrition and income at both the family and national levels. Any changes to the availability of these resources are likely to have major negative impacts in terms of nutrition and income but also in terms of social equity.

#### PROPOSED MAINSTREAM HYDRO DAMS IN CAMBODIA COULD REDUCE THE AVAILABILITY OF FISHERIES BY UP TO 34%

Multiple factors including management, population and demand growth, climate change, and hydropower damsdevelopment are likely to impact fish yields, fish consumption and food security in Cambodia. In 2030, the human population of Cambodia is expected to reach 20 million (+43%), which is one of the most significant challenges for improving or sustaining food security. Cambodia's population is growing fast and fisheries production may not be able to meet this increase in demand unless it is managed well.

A study led by the Fisheries Administration has considered the likely impacts of building dams on the mainstream of the Mekong, using various scenarios based on current proposals and plans. These impacts include the likely effect of such dams on fish migrations to and from spawning grounds; the subsequent effect on breeding and therefore on fish stocks; the potential changes to food security arising from changes to yields on capture fisheries; and lastly, the potential impacts on people's diets and nutrition, focusing particularly on those who depend on fish for essential elements of their food intake. The study highlighted the impact of the two proposed mainstream dams – *the Stung Treng and Sambor*.

The *Sambor dam alone* is predicted to reduce yields of fish and other aquatic animals by 16% to 31% or 98,000–182,000 tonnes compared to 2011 baseline values. The development of the *Stung Treng dam* is predicted to reduce yields of fish and other aquatic animals by 6% to 24% or 34,000–145,000 tonnes.

The study concluded that the Sambor dam alone would block all fish migrations upstream and therefore the *combination of the Stung Treng and Sambor dams* was predicted to reduce yields of fish and other aquatic animals by a similar amount (98,000–182,000 tonnes).Dams on the Mekong tributaries are likely to further reduce fish availability.

In the absence of mainstream dams in Cambodia, the per capita supply of inland fish and other aquatic animals is expected to decline from approximately 63 kg per capita in 2011 to approximately 44 kg by 2030 due to population growth. The Cambodian mainstream dams would reduce this supply by a further 6% to 34% depending on the scenario considered. This would mean a fish consumption rate of just 29-41 kg/person/year (as opposed to 63 kg/person/year in 2011). Such a drop in the supply of inland fish and other aquatic animals would strongly affect nutrition and food security, and that source of affordable protein would need to be replaced at a higher cost.

### IMPACT OF MAINSTREAM DAMS ON FOOD SECURITY AND HEALTH

The results of this study confirm that the construction of the mainstream dams will have the strongest impacts on nutrition, as there will be a reduction in the percentage of Cambodians meeting the recommended daily allowance (RDA) for key nutrients – energy, protein and iron (See Box 1 below). A reduction of 34% in the fish and fish products available, especially in the long-distance migrants that are an important source of iron, would have a strong detrimental impact on the rural population living in the plains. This group is are already considered the least nutrient-secure in the country, and any reduction in the availability of fish would drive iron security even lower and pose a risk to public health. Children and pregnant women are the group most vulnerable to protein deficiency, as it has the lowest rate of protein RDA satisfaction.

The nutrition survey datashow that protein intake is high in the population of Cambodia, with 89% of individuals reaching the required daily levels thanks to the contribution of fish (fish contribute 76% of the total daily animal protein intake). However, only 25% of the population reach the necessary levels of energy and only 19% meet the required levels of iron. It is the school children age group that has the lowest rate of energy satisfaction. Infants under 5 years old and pregnant women are the groups most deficient in iron.



## CAN WE AS A NATION MINIMIZE OR REPLACE LOSSES TO THIS SOURCE OF PROTEIN, INCOME, AND LIVELIHOODS?

The decline in fisheries, if not properly addressed and adapted to in a timely fashion, decreases the likelihood that the country will meet the Cambodian Millennium Development Goals (CMDGs), since the decline will affect food security and poverty. Livestock, poultry, and animal husbandry may compensate for those losses only partially and will be more costly (Orr *et al.* 2012). Numerous fishery experts and resource economists maintain that aquaculture or new stocking techniques can only replace a small percentage of the losses in wild fish catches and will require levels of investment that are normally not available to the poor. The report by IFReDI (2012) shows that aquaculture requires suitable land areas, access to water (especially in the dry season), seed, feed, labor and skill, and for animal husbandry, conversion or use of land as grazing areas.Consistent with other studies, the IFReDI(2012)study finds that aquaculture will not compensate for the loss of fisheries arising from mainstream dams. The findings highlight the urgent need to looking at water resources, energy management, land management and food security as cross-cutting concerns at the national and sub-national levels.

### **RECOMMENDATIONS:** potential entry points for better integrating fisheries into water, food and energy decision making in cambodia

There are potential entry points for integrating fisheries, water, land, food and energy priorities in the national decision making process to support economic development and to improve the living standards of Cambodian people.

- 1) As the 2013 Election is fast approaching, the Supreme National Economic Council (SNEC), and Ministry of Planning (MOP) are coordinating the development of the Royal Government of Cambodia's (RGC) new policy platform the Triangular Strategy. The ongoing review of the comprehensive strategy *"Rectangular Strategy for Growth, Employment, Equity, and Efficiency"* and National Strategic Development Plan (NSDP) for the coming July 2013 General Election is an opportunity to integrate the sustainability of fisheries, water and land management, energy needs and the agriculture sector within a green economic approach and sustainable livelihoods framework. The FiA and the project partnersnow need to work closely with the above institutions to help ensure that the findings of this study are reflected in the RGC development framework.
- 2) The development of energy production projects (e.g. hydropower) within Cambodia needs to be reviewed in the context of a national river basin management plan that addresses all demands for water use, social and environmental considerationsand the development needs for ensuring food security and poverty reduction, through mechanisms that engage relevant ministries including the Ministry of Agriculture, Forestry and Fisheries (MAFF), Ministry of Water Resources and Meteorology (MOWRAM), Ministry of Land Use Planning and Construction (MLUPC) and Ministry of Industry, Mines and Energy (MIME).
- 3) A mechanism for coordinating development partners is another key entry point to be considered. Theprivate sector will soon be included in the Cambodia Development Forum (CDF). This inclusion should allowmore meaningful engagement of the private sector as part of the water, food and energy decision-makingprocess.
- 4) The Government-Development Partner Coordination Committee (GDCC) is the highest level for political dialogue and review of National Strategic Development Plan (NSDP) implementation, as well as for discussing the resourcing of the NSDP and for endorsing the Joint Monitoring Indicators (JMIs).Key fisheries indicators should be developed using the results of this study and included in related Monitoring Indicators.
- 5) Furthermore, close monitoring and evaluation of the contribution of fisheries to national food security and nutrition should be carried out systematically to inform policies and decisionsrelated to water management, land management, energy and food security.
- 6) Decisions regarding the development of dams should be deliberated collaboratively through applying relevant scientific and indegenous knowledge and incoporating fisheries and their social, economic and livelihood dimensions in the decision-making process.