REPORT OF THE NATIONAL WORKSHOP ON AQUATIC BIODIVERSITY AND NUTRITION FROM RICE-BASED ECOSYSTEMS: ENHANCING BIODIVERSITY AND AGRICULTURAL PRODUCTIVITY

Vientiane, Lao People's Democratic Republic, 4–5 June 2008

National Workshop

on

Aquatic biodiversity and nutrition from rice-based ecosystems: Enhancing biodiversity and agricultural productivity

Workshop Report

Opening of the workshop

The workshop on *Aquatic biodiversity and nutrition from rice-based ecosystems: Enhancing biodiversity and agricultural productivity* was held in Vientiane, Lao PDR at the Novotel on June 4-5, 2008. Prospectus and agenda are attached to this report as Annexes 1 to 2. The workshop was attended by 34 participants from 7 international and 9 national agencies (see Annex 3 for list of participants).

The workshop was opened by Mr. Bounthong Saphakdy, the Director of the Fishery Division of the Department of Livestock and Fishery (DLF) of the Ministry of Agriculture and Forestry (MAF), who welcomed the participants in Vientiane.

Mr. Serge Verniau, the country representative of the FAO in the Lao PDR gave the first welcome address; he stressed that, while aquatic biodiversity from rice-based ecosystems has been long recognized as playing an important role for livelihood and nutrition, there is a pressing need to translate this knowledge in policies and action on the ground. He expressed concern on the increased use of pesticides in the country and the involvement of civil servants in the promotion of agrochemicals to be used in rice fields. The full text of his statement can be found in Annex 4 of this report.

Mr. Somphanh Chanphengxay, the deputy director general of DLF-MAF stressed in his welcome address the importance of aquatic biodiversity for nutrition and health of the people and urged the agricultural sector to take this into account. He recognized the need for a strategy to translate the findings of the various researches into government policies and action plans.

Organization of the workshop

The workshop was chaired by Mr. Somphanh Chanphengxay, DDG, DLF-MAF. Dr. Bounthom Phengdy from the Department of Hygiene and Prevention (DHP) and Mr. Bounthong Saphakdy from DLF-MAF led the discussions of the two working groups. The final agenda was presented and adopted.

Presentations

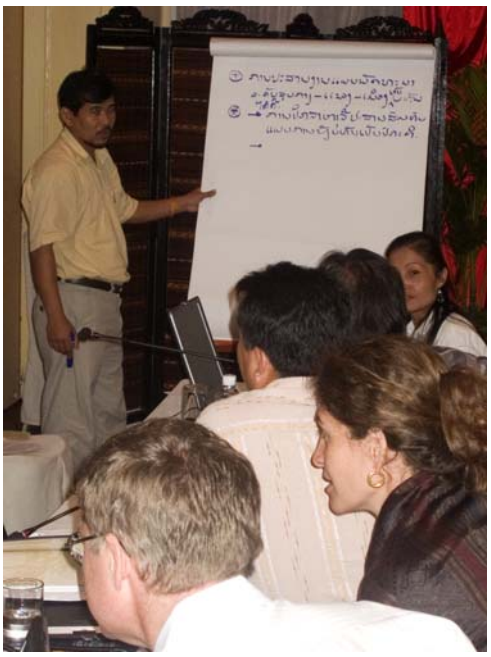
The first presentation was given by Dr. Matthias Halwart, FAO Rome. He gave an overview on the history of FNPP activities related to aquatic biodiversity in the region and summarized the findings. He then put the findings in context with international efforts and policies and presented the objectives of the workshop, namely:

- to share information and experiences on importance and management of aquatic biodiversity from rice-based ecosystems among various stakeholders;
- to discuss good management practices which combine the enhancement of aquatic biodiversity with an increase in the production of rice;
- to discuss the role and potential of aquatic biodiversity to alleviate malnutrition;
- to agree on recommendations for future activities and immediate steps to be undertaken in order to achieve an enhancement of aquatic biodiversity and an increased rice production.

In the second presentation, Ms. Khamphaeng Homsombath, LARReC, illustrated the methodology and findings of the FNPP sponsored household survey on catch and consumption of aquatic biodiversity in the Lao PDR. She explained that fish (49%) and amphibians (31%) were the most important animals caught by households while molluscs (19%) and insects (1%) were less important. Almost two thirds (65%) of all organisms caught by households originated from rice-based ecosystems, the remainder (35%) came from other sources (rivers, streams, lakes). These results impressively underline the importance of rice-based ecosystems for the livelihood and nutrition of rural households in the Lao PDR.

In the ensuing discussion it was noted that the study had excluded aquatic plants; plants further add to the value of non-rice products that originate from rice-based systems. Further, the importance of micro-organisms and plankton as food source for fish, frogs, crustaceans and molluscs was stressed; these would be affected by chemical inputs.

Adding to this, Mr. Serge Verniau, FAO, reiterated his concerns about the increased use of pesticides in the Lao PDR; he elaborated on the strict norms and regulations in place in European countries and encouraged the Laotians to follow this example.



The next study by Ms. Mulia Nurhasan on the *Nutritional Composition of Aquatic Species in Laotian Rice Field Ecosystems; Possible Impact of Reduced Biodiversity* was presented by Ms. Penroong Bamrungrach. The results of the research indicate that the aquatic species analyzed contained high protein, low fat and high ash (corresponding to a high mineral content). The examined species were considered a good source for amino acids, especially lysine, calcium, iron and zinc, and less so for lipids and Vitamin A. The study further revealed that *padek*, the typical Lao fish paste, contained high quality protein and essential amino acids (esp. lysine). Homemade *padek* was found to be richer in nutrients than the commercial product from the markets.

In response to the presentation, it was commented that content of both lipids and Vitamin A is species specific and also related to the selection and processing of the samples (the removal of bones, head and entrails analogous to the usual preparation done in a Lao household). It was further elaborated that a small Bangladeshi fish species (*Mola*) has been found extremely rich in Vitamin A and that the Vitamin is concentrated in the eyes and gut of the fish; eating it whole substantially adds to Vitamin A intake. These findings have led to a change in policy in Bangladesh which previously considered small fish as "weed fish" in fish ponds and originally recommended to eliminate them in pond aquaculture operations; this recommendation was subsequently reversed.

As next speaker, Mr. Boun-Oum Douangphrachanh, DDG of the Department of Agriculture, presented the efforts of his department in the field of IPM and the promotion of organic rice farming. He noted the lack of qualified staff, especially in provinces and districts. He stressed the need to produce information material both to disseminate information on new techniques to produce rice and properly apply IPM as well as to inform about the dangers of improperly applying agrochemicals.

The presentation was well received and attention was called to the possibility of the Lao PDR to become the region's largest producer of organic agricultural products. The importance of cooperation between the various actors involved in the agricultural sector were undelined and the importance of proper regulations regarding agrochemicals emphasized.

The sustainable use of the rice field ecosystem was the topic of the next presentation by Ms. Nouhak Leipvisay. She presented the joint efforts of the DLF's Aquaculture Improvement and Extension Project with volunteer student groups, the Center for Environment and Development Studies of the National University of the Lao PDR, the Nagao Environment Foundation and NARC, Japan. The project involved school children in the collection of samples from rice-based ecosystems, thus creating awareness among them about the biodiversity and importance of the organisms found in this

environment.

Mr. Somphanh Chanpengxay praised the study as a good example on how to convey knowledge on the importance of aquatic biodiversity to schools and school children, taking note that the education on these matters is of crucial importance for the future of the rice-based ecosystems and its associated biodiversity.

Dr. Gary Jahn, Coordinator for the Greater Mekong Subregion from IRRI was the next speaker; he aptly titled his presentation *More than rice itself: rice, fish, and aquatic biodiversity*. He warned to fall prey to the conflict mentality of agriculture versus environment, stressing that it is possible to promote both. His recommendations included to preserve existing natural wetlands, to enhance the connectivity between those wetlands and the wet paddy fields and to intensify rice production on these existing paddy fields without further expansion of the present paddy area. He stressed the need to enhance existing aquatic areas to become suitable habitats for aquatic life e.g. by creating eco-friendly canals for irrigation instead of underground pipes.

In reaction to the presentation, support for these recommendations was expressed by NAFRI, noting the lack of natural wetlands in some rice growing areas of the country and citing Savannakhet as an example as opposed to Champassak where natural wetlands abound. Thus it were essential to create small-scale habitats for aquatic organisms as shown in the presentation, e.g. by digging of pits and protecting them especially during the dry season. The usefulness of such pits as a water reserve for small-scale cultivation was noted. Other interventions from the floor included MRC stressing that there is scope for diversification also with other aquatic crops such as water chestnuts, kangkong (*Ipomoea aquatica*) and lotus for consumption and reeds for basket making and thatch.

Regarding the use of exotic species in irrigation canals and ponds, it was pointed out that this is mostly due to the availability of fish seed; while at the same time there is often no such supply for indigenous fish species. This is currently being addressed through research and development projects and constraints might be overcome in the future.

The next presentation by Mr. Seumsee Soulita, WWF, dealt with *Participatory Fishery Monitoring* and the *Analysis of Rice Field Fisheries* in the Xe Kong basin of the Lao PDR. Also this analysis showed the tremendous importance of rice-based ecosystems as source of food and livelihood for the people of the Lao PDR. A significant portion of the fishing effort is directed there, the rice-based ecosystems include a wide range of aquatic animals and the aquatic animal production from this environment makes up a significant part of the diet in the households surveyed for the study.

Mr. Kent Hortle, MRC, introduced the rice-based ecosystems of Battambang in the neighboring Kingdom of Cambodia. In his presentation on ricefield yield and value he revealed that the value of the fish yield from rice field areas in Battambang exceeds two thirds of the value of the rice yield, stressing that this was the case without any management effort on the fishery side. And, while the rise in rice prices is well publicized, there is an internationally largely unnoticed rise in fish prices as well at a rate that partly exceeds that of the rice. In the near future, fishing in rice-based ecosystems could become more profitable than rice farming. Mr. Hortle continued to give

some ideas on how fish yield could be increased through simple management interventions. He emphasized the importance of black fish as well as frogs and stressed that they should be given special attention in research and extension. Furthermore he named several constraints to an increase in the rice-based fishery; most prominent among them the ownership question because fish are an open-access resource and farmers are unlikely to invest in the development of a resource they do not own.

Following this presentation, the FAO/MAF Lao PDR video on *Aquatic biodiversity and nutrition in the Lao PDR* was shown; the video is accessible at http://www.fao.org/biodiversity/country-in-focus-laos/en/

Mr. Phouvieng Latdavong, NAFRI, presented the status of the fishery legislation particularly as it relates to rice-based ecosystems. The fishery law of the Lao PDR is presently being developed in a consultative process supported by FAO. The preliminary results of the LARReC/DLF Household Survey (presented above) had been made available to the experts developing the legislation to ascertain that issues concerning ricefield fisheries are adequately covered. The legal problem surrounding fishery in rice-based ecosystems is that of ownership: while the rice fields have designated owners, the wild fish and other aquatic animals are property of the national community. However, the access to the rice field is allowed only with explicit consent of its designated owner. There is a marked difference in tradition between southern and northern Laos: While the northern Lao stress the private ownership of the land, the southern Lao stress the public ownership of fish and other aquatic animals. Access to a privately owned area may be governed by water level: as long as the bunds of the rice field are above the water level, the access to the field is restricted and requires consent of the owner; once the bunds of the field are under water, access to the field is public.

In response to the presentation concern was expressed regarding the rights of landless poor people in rural areas; they mostly depend upon wild resources for food and restricting access to rice fields may lead to conflict. The group was informed that the law was still in draft form and that a workshop would be held in the following week. A compromise was suggested in which the law may generally restrict the access to the rice fields, requiring the owner's permission unless local customs and/or regulations say otherwise.

Dr. Bounthom Phengdy, DHP, gave the next presentation on human nutritional deficiencies in the Lao PDR. She pointed to a high prevalence of chronic malnutrition (41% stunting), the existing prevalence of acute malnutrition (7% wasting) leading to an overall picture of malnutrition (37% underweight). In addition she noted the "hidden" malnutrition manifested in micronutrient insufficiencies such as anaemia, Vitamin A deficiency and iodine deficiency disorders. Causes are, among others, a too low calorie intake, diseases and parasites, the increasing scarcity of wild meats, fish and other aquatic animals, low fruit consumption and limited bioavailability of fat soluble nutrients due to a low fat intake. Dr. Bounthom stressed that malnutrition does not only have consequences for the individual but also constrains socio-economic development of the nation as a whole. She recommended to make nutrition central in development through increased inter-sectoral cooperation, commitment and priority investment.

Dr Bounthom Phengdy continued to give also the next presentation on the National Nutrition Policy. She stated that the overall goal of the National Nutrition Policy is to substantially reduce levels of malnutrition, especially of vulnerable groups, and to mainstream nutrition in national socio-economic growth and poverty reduction policies and strategies. To achieve this, objectives, programs and targets were developed, the scope defined and partnerships sought. Implementation of the National Nutrition Policy should start once it has been endorsed.

This was the final presentation and concluded the first part of the workshop. In the following part, participants separated into two working groups for more specific discussions on selected topics.

Working group discussions

The working groups formed in the second part of the workshop discussed the following two topics:

1. Improving ricefield management to enhance aquatic biodiversity and produce higher yields
2. Aquatic biodiversity and nutrition: necessary developments to overcome malnutrition

Each group selected a moderator and rapporteur. The discussion lasted for about two hours and the results were subsequently presented by each group's moderator.

The findings of the group focussing on how to improve the rice field management to enhance aquatic biodiversity and produce higher yields, included:

- A constraint to improved management of ricefield areas is the incomplete land-related legislation;
- The use of agricultural land should be better monitored;
- Capacity building for farmers as well as for staff of technical departments is required;
- Farmer groups should be used as entry point for training efforts and pilot projects; if not existent they need to be created;
- Curriculum development for appropriate training content is needed;
- Coordination between involved departments both in Vientiane and in provinces/districts is urgently needed.

The second group, discussing aquatic biodiversity and nutrition: necessary developments to overcome malnutrition, presented the following output:

- A marked discrepancy exists between the occurrence of malnutrition (highest in the south, lowest in the north) and the availability of rice and fish & other aquatic animals (highest in the south, lowest in the north).
- Several hypotheses were raised:
  - Due to unsafe food habits (eating uncooked fish)and high prevalence of parasites in the south
  - Lower food intake in the south due to marketing of fish

The group concluded that it is imperative to uncover the root cause of malnutrition when assessing the role of aquatic biodiversity for its alleviation. The geographic precision of the data on malnutrition needs to be improved, and the above hypotheses verified through further studies. A coordination team between MAF and DHP should be created for this purpose.

Conclusions and recommendations

Based on these results, the ensuing discussions, and consensus building among the workshop participants, the following recommendations were formulated by the Chair of the workshop, Mr. Somphanh Chanphengxay, DLF/MAF:

- Agricultural biodiversity in Lao PDR is the basis for food security of the Lao people. The ricefield ecosystem and its associated biodiversity, in particular the aquatic part, needs to be given highest priority in future research and development projects;
- Aquatic biodiversity from rice-based systems is too important for the nutrition of rural household members to be overlooked in agricultural development; increased efforts should be made to improve the database/statistics on aquatic biodiversity from rice based ecosystems;
- The lack of information on the root causes of malnutrition in Lao PDR needs to be addressed urgently;
- To enhance the rice/aquatic biodiversity resource base, cooperation between all involved departments is required;
- Awareness creation and law enforcement in the field of agrochemicals is urgently needed, and the relevant legislation may need to be updated;
- Existing experiences should be collected systematically and successful approaches multiplied throughout the country;
- Since connectivity between natural wetlands and rice fields is crucial for the migration of aquatic species, connectivity channels should be maintained where they exist and created were they don't exist.
- A strategy for the dissemination of relevant information to farmers, schools and technical agencies should be established and used;
- Schools at all levels (including Farmer Field Schools) should be the target for information on the importance of aquatic biodiversity and its proper management;
- To address these issues, additional financial resources are urgently required and interested donors should be identified.

In his closing remarks, Dr. Matthias Halwart, speaking also on behalf of the FAO Representative, thanked the workshop participants and emphasized that the discussions had made everyone realize how much work still remains to be done. He stressed that further progress on the improved interaction between agricultural production and aquatic biodiversity will depend upon each participant present in the room. Recalling the importance of aquatic biodiversity for nutrition and livelihood, he underlined that it is too important to be overlooked in future developments. He further underlined that an increasing involvement of the National University in the research of rice-based ecosystems is desirable; studies on existing enhancement techniques in the Lao PDR could be conducted by students with the guidance and support of the University's faculty. He suggested that subsequently a write-shop should be conducted during which such existing enhancement methods would be documented and compiled into a publication that can serve as a guide for practitioners. Citing the example of a joint writeshop among IIRR, FAO, IDRC, NACA, and WFC on Utilizing Different Aquatic Resources for Livelihoods in Asia (http://www.iirr.org/aquatic_resources/), he underscored the importance of proper documentation of existing knowledge for the benefit of the wider public. Dr. Halwart expressed his hopes that the above recommendations will be

picked up in the near future and adequate funding can be identified. He once more highlighted the importance of good cooperation and coordination between the various actors involved, expressed his gratitude to DLF for hosting and particular thanks to the FAO Netherlands Partnership Programme for the financial support. He ended by congratulating all participants for their valuable and fruitful discussions and excellent results which made the workshop an important milestone and memorable exercise on the way to enhancing aquatic biodiversity from rice-based ecosystem alongside with agricultural production.

In conclusion, Mr. Somphanh Chanpengxay equally conveyed his gratitude to the workshop organizers, the working groups and all participants. He underlined the need for a better cooperation in the future and expressed his hopes that this workshop may be an initial step to be followed by many others focussing on further improvements of the interaction between rice and ricefield fisheries. He reminded the participants of the workshop on the fisheries legislation in the coming week and officially closed the workshop.

Annexes

1. Prospectus
2. Agenda
3. List of participants
4. Opening remarks of Mr. Serge Verniau, FAO representative in the Lao PDR
5. Presentations
   - *5.1. National workshop on aquatic biodiversity and nutrition: the contribution of rice-based ecosystems - introduction and overview* Dr. Matthias Halwart, FAO Rome;
   - *5.2. Importance of fish and other aquatic animals in rice-based ecosystems in Lao PDR,* Khamphaeng Homsombath, LARReC;
   - *5.3. Nutritional composition of aquatic species in Laotian rice field ecosystems; possible impact of reduced biodiversity*, Penroong Bamrungrach, FAO consultant, on behalf of Mulia Nurhasan, Tromsø University, Norway;
   - *5.4. Biodiversity in rice fields in Lao PDR*, Boun-Oum Douangphrachanh, DoA, MAF;
   - *5.5. Sustainable utilisation of rice field ecosystems,* Nouhak Leipvisay, DLF, MAF;
   - *5.6. More than rice itself: rice, fish and aquatic biodiversity*, Dr. Gary Jahn, IRRI;
   - *5.7. Participatory fishery monitoring: analysis of rice field fisheries,* Seumsee Soulita, WWF;
   - *5.8. Ricefield yield and value in Battambang Province, Cambodia,* Dr. Kent Hortle, MRC;
   - *5.9. Development of Fisheries Legislation for Lao PDR, Rice field fisheries and related legislation*, Phouvieng Latdavong, NAFRI;
   - *5.10. Undernutrition in Lao PDR,* Dr. Bounthom Phengdy, DHP;
   - *5.11. National nutrition policy*, Dr. Bounthom Phengdy, DHP.

National Workshop
on
Aquatic biodiversity and nutrition from rice-based ecosystems: Enhancing biodiversity and agricultural productivity

MAF-DLF / FAO
Vientiane, June 4 – 5, 2008

Background

The Lao PDR is a country with a rich aquatic biodiversity in its rivers, lakes and wetlands. This richness has always been tapped by humankind for food, barter and income, and numerous studies have shown its importance for the nutrition and livelihood of the Lao people.

Rice-based ecosystems, that is, rice fields and the small water bodies in their immediate neighbourhood have been less recognized as a source of aquatic animals for human nutrition and food security; they are usually seen as a source of rice only. However, rice fields form part of the intricate system of wetlands that can be found throughout the country, and therefore also harbour a highly diverse set of aquatic organisms. The catch from rice fields usually is modest and only sufficient for a single day. For this reason, the fish and other aquatic animals caught from rice-based ecosystems go largely unnoticed – making it an "invisible" fishery. Nevertheless, since many people are involved in this type of fishery day after day, the total amount can be quite significant.

In an attempt to "make the invisible fishery visible", a household survey has been conducted in a total of 240 households in three provinces of the Lao PDR. Beginning in October 2006, the survey has been conducted monthly until October 2007. The findings of the survey were astonishing: about two thirds of all aquatic organisms consumed by the targeted households originated from rice-based ecosystems. Among the organisms caught and consumed regularly were fish, frogs, snails, shrimps and aquatic insects. The findings of the survey have once again underlined the importance rice fields as source of non-rice foods.

In the course of its 20th Session, the International Rice Commission the Commission not only acknowledged the importance of aquatic biodiversity but recommended to its member countries the enhancement of this resource base and to give stronger attention to the nutritional contribution of aquatic organisms in the diet of rural people.

We are now faced with a situation where an increasing global shortage of rice leads to rising prices which in turn push for increased rice production. If this is done along the traditional lines of intensification, namely the increased input of chemical fertilizers and pesticides, as well as an expansion into natural wetlands this may worsen the overall nutritional situation of the rural people because the aquatic biodiversity in natural wetlands and the rice-associated biodiversity of the rice-based ecosystems are going to be negatively affected. Ways must be found which combine the desired increase in rice production with an enhancement of the rice-associated aquatic biodiversity for the benefit of the Lao people.

Goal

Goal of the workshop is to contribute to the sustainable development of rice-based ecosystems in Lao PDR that aims at enhancing the aquatic biodiversity while at the same time increasing the production of rice.

Objectives

Objectives of the workshop are:

1. to share information and experiences on importance and management of aquatic biodiversity from rice-based ecosystems among various stakeholders;
2. to discuss good management practices which combine the enhancement of aquatic biodiversity with an increase in the production of rice;
3. to discuss the role and potential of aquatic biodiversity to alleviate malnutrition;
4. to agree on recommendations for future activities and immediate steps to be undertaken in order to achieve an enhancement of aquatic biodiversity and an increased rice production.

Expected outputs

Output of the workshop will be the workshop report. This will contain a list of recommendations for future activities and interventions directed at the Lao government, FAO, and other stakeholders.

Online Resources

To find out more on the background for the Expert Meeting, the following documents can be found online:

First Outputs of the case studies in Cambodia, China, Laos and Viet Nam:
ftp://ftp.fao.org/fi/CDrom/AwarnessAgrBiodiv/default.htm

Recommendations of the 20th Session of the International Rice Commission:
http://www.fao.org/ag/AGP/AGPC/doc/field/commrice/pages/sessions.html#01

Proceedings of the Regional Workshop on Traditional Use and Availability of aquatic biodiversity in rice-based ecosystems, held at Xishuangbanna, China:
ftp://ftp.fao.org/fi/document/xishuangbanna/xishuangbanna.pdf

Presentation for the 8th SBSTTA Meeting of the Convention of Biodiversity in Montreal on Utilization of Aquatic Biodiversity in Mountainous Rice-Based Ecosystems of China and Viet Nam.
Abstract at: http://www.biodiv.org/doc/publications/cbd-ts-08.pdf
and poster: ftp://ftp.fao.org/fi/CDrom/AwarnessAgrBiodiv/poster.pdf

RAP publication 2003/11 on an Analysis of the Role and Nutritional Value of Aquatic Resources in the Livelihoods of Rural People:
www.fao.org/DOCREP/004/AD454E/ad454e00.htm

Aquatic Biodiversity: from research evidence to national policy towards a National Agricultural Biodiversity Programme for Lao PDR
ftp://ftp.fao.org/docrep/fao/007/y5550e/Y5550e12.pdf

Summary of a case study on nutrition and aquatic resources in Quang Tri Province, Viet Nam: ftp://ftp.fao.org/docrep/fao/007/y5550e/Y5550e08.pdf

Fact Sheet on Aquatic Biodiversity as part of awareness raising in preparation of the International Year of Rice: http://www.fao.org/rice2004/en/factsheets.htm

Collection of documents related to aquatic biodiversity in rice-based ecosystems in the Lao PDR: http://h1.ripway.com/LaoDocs1/start.htm

Flyer on aquatic biodiversity and human nutrition – the contribution of rice-based ecosystems: http://h1.ripway.com/LaoDocs2a/Flyer5_FINAL_s.pdf

Video on aquatic biodiversity and human nutrition – the contribution of rice-based ecosystems: http://h1.ripway.com/LaoDocs2a/html/start.htm

Workshop Agenda

Wednesday, June 4, 2008	
08:00 – 09:00	*Registration*
09:00 – 09:30	Opening ceremony
09:30 – 09:45	Opening remarks (NAFRI or DLF)
09:45 – 10:00	Opening remarks (FAO representative)
10:00 – 10:30	*Coffee break*
10:30 – 10:55	Introduction and overview (M. Halwart, FAO)
10:55 – 11:20	Importance of Fish and OAAs in rice-based ecosystems in Lao PDR (Khamphaeng Homsombath, LARReC)
11:20 – 11:45	Nutrition content of selected species from Lao PDR (Penroong Bamrungrach)
11:45 – 13:00	*Lunch Break*
13:00 – 13:25	Biodiversity in rice fields in Lao PDR (Dept. of Agriculture)
13:25 – 13:50	Sustainable utilisation of rice field ecosystems (AQIP-2/DLF)
13:50 – 14:15	More than rice itself: Rice, fish and aquatic biodiversity (IRRI)
14:15 – 14:40	Participatory fishery monitoring: Analysis of rice field fisheries (WWF)
14:40 – 15:05	Yield and value of the wild fishery of rice fields in Battambang Province, near the Tonle Sap Lake, Cambodia (MRC)
15:05 – 15:15	Video presentation: Aquatic biodiversity and nutrition (MAF/FAO)
15:15 – 15:30	*Coffee break*
15:30 – 15:55	Development of Fisheries Legislation for Lao PDR: Rice field fisheries and related legislation (NAFRI)
15:55 – 16:20	Nutritional deficiency in Lao people (Dept. Of Hygiene and Prevention, MoH)
16:20 – 16:45	National Nutrition Policy for Lao PDR (Dept. Of Hygiene and Prevention, MoH)
19:00 – 21:00	*Welcome dinner*

Thursday, June 5, 2008	
08:00 – 08:30	Summary of first day workshop
08:30 – 10:00	Division into two working groups: 1. Improving rice field management to enhance aquatic biodiversity and produce higher yields 2. Aquatic biodiversity and nutrition: necessary developments to overcome malnutrition
10:00 – 10:30	*Coffee break*
10:30 – 12:00	Working group discussion continues
12:00 – 13:00	*Lunch break*
13:00 – 14:00	Group 1: Presentation of group work and discussion
14:00 – 15:00	Group 2: Presentation of group work and discussion
15:00 – 15:30	Summary of 2nd day
15:30 – 16:00	*Coffee break*
16:00 – 16:30	Way forward (DLF)
16:30 – 16:45	Closing remarks (FAO representative)
16:45 – 17:00	Closing remark (DLF)

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Opening Remarks
Serge Verniau, FAO Representative

On the occasion of the joint DLF/FAO National Workshop
4 June 2008, Vientiane, Lao PDR

Distinguished guests, colleagues, ladies and gentlemen

I am delighted to welcome you all to the **National workshop on aquatic biodiversity and nutrition from rice-based ecosystems** here in Vientiane, Lao PDR.

Within these two days the delegates in this room will have the opportunity to exchange experiences and discuss a broad range of topics concerning the enhancement of the aquatic biodiversity in rice-based ecosystem. I am confident that this workshop will raise awareness on the current state of biodiversity in rice-based ecosystem in Lao PDR and come up with recommendations for future activities to be undertaken by involved agencies that aim at enhancing the aquatic biodiversity in rice-based ecosystems while at the same time increasing the agricultural productivity.

Aquatic biodiversity in rice fields has long been recognized in international fora, including the International Year of Rice (IYR) 2004, raising awareness that aquatic biodiversity in rice-based ecosystems needs to be more firmly integrated into a wide range of national, regional and international programmes to ensure that appropriate action plans on the conservation and sustainable use of these resources can be drawn up and implemented properly. More recently, in the course of its 20th Session, the International Rice Commission the Commission not only acknowledged the importance of aquatic biodiversity but also recommended to its member countries to work towards the enhancement of this resource base and to give stronger attention to the nutritional contribution of aquatic organisms in the diet of rural people.

We are now potentially facing the beginnings of a global food crisis, particularly a global shortage of rice which leads to rising prices. The rice shortage has recently become a big issue when previously rice exporting countries stopped exporting their rice. Like many other countries the Lao PDR may as well be affected by this situation. There is a rising pressure to intensify the rice production to meet global demand. Such an effort may well be accompanied by an increased use of chemical fertilizers and pesticides. This in turn will most certainly have a negative impact on both environment and human livelihood. Non-rice products of rice field ecosystems – fish, frogs, shrimps, snails and many others more - which are an integral part of the people's daily diet as a source of protein, vitamins and minerals will also be negatively impacted by such a development.

Distinguished delegates, colleagues, ladies and gentlemen,

When we work towards an increase in the rice production, we need to work together to avoid these negative impacts while trying to jointly enhance the biodiversity and the productivity of our agricultural areas.

Thank you for your attention and may I wish you all fruitful and productive discussions.

National Workshop
on
Aquatic Biodiversity and Nutrition
The contribution of rice-based ecosystems

Introduction and Overview

Matthias Halwart
Fisheries and Aquaculture Department
Food and Agriculture Organization of the United Nations
(FAO)
and
Boonsong Saphakdy
Fisheries Division, Department of Livestock and Fisheries
Ministry of Agriculture and Forestry

Fisheries

Background

- Rich aquatic biodiversity in rivers, lakes and wetlands of Laos used for food, barter and income
- Rice-based ecosystems usually recognized for rice production only
- Fish and the fishery are "invisible"
- Modest catches but
  - in large area
  - by many people
  - regular daily activity
- Policy measures and decisions may negatively affect livelihoods
- Aim of LARReC/DLF/FAO activities: "Making the invisible visible"

Fisheries

Step I - Qualitative assessment of aquatic biodiversity in rice fields

- FAO-Netherlands Partnership Programme, Phase I:
  - Studies on **availability** and **traditional use** of **aquatic biodiversity** from **rice-based** ecosystems
  - Cambodia – 2001
  - China – 2001
  - Lao PDR – 2002
  - Viet Nam – 2002

Fisheries

Key finding: Amazing numbers of utilized aquatic species from rice fields!

	Cambodia	China	Laos	Viet Nam	Total
Amphibians	2	3	10	--	11
Crustaceans	6	4	5	3	11
Fishes	70	54	26	14	145
Molluscs	1	5	8	6	15
Reptiles	8	--	7	--	13
Plants	13	--	20	14	37
Total	**100**	**66**	**74**	**37**	**232**

Fisheries

- FAO/NACA Asian Regional Workshop on Traditional use and availability of aquatic biodiversity in rice-based ecosystems, Xishuangbanna, Yunnan, P.R. China. Recommendations included
  - to analyse available aquatic species and their importance for a balanced diet (e.g. regarding Vitamin A, essential fatty acids)
  - to conduct follow-up research on the more important consumed species in terms of nutritional value
  - to investigate possibilities to increase the availability of these species

Fish

Policy framework – international level

The International Rice Commission (IRC) recommended that

- Member countries should promote the sustainable development of aquatic biodiversity in rice-based ecosystems and policy decisions and management measures should enhance the living aquatic resource base.
- In areas where wild fish are depleted, rice-fish farming should be considered as a means of enhancing food security and securing sustainable rural development.
- Attention should be given to the nutritional contribution of aquatic organisms in the diet of rural people who produce or depend on rice.

FAO (2002). Report of the International Rice Commission 20th Session (23-26 July 2002, Bangkok). FAO, Rome.

Fisheries

Step II - Valuing aquatic biodiversity

- Many aquatic organisms are harvested from rice-based systems. To what extent do they contribute to the overall diet?
- What is the nutritional value of the species encountered?
- To answer these questions, the next steps were:
  - a household survey to assess the quantitative contribution of rice-based systems to the nutrition;
  - A study focusing on the nutrition value of important species from the rice-based ecosystem.

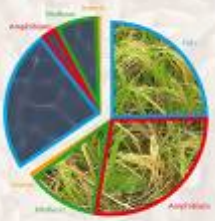
Fisheries

First key results ...

- About two thirds of all the fish and the Other Aquatic Organisms (OAA)

  and
- ≥50 percent of fish

  caught by households come from habitats within the rice fields!



Fisheries

First key results ...

- Amphibian catches (mostly frogs) are very high, ninety percent of these frogs come from rice field habitats
- Rice fields are also important for a wide range of crab and snail species, also important to the Lao diet, and, to a lesser extent, aquatic insects

Fisheries

Nutritious value of fish and OAAs

- Apart from volumes also the nutrient content of the consumed food items needs to be known
- For many of the consumed organisms this information is not available
- To address this problem, a study on the nutrient content of the major consumed species was commissioned
- The study has been carried out in collaboration with Tromsø University, Norway
- First findings point to particular importance of fish and OAA for protein/amino acids, calcium, iron and zinc.

Fisheries

Policy framework – national level

- Incorporate information into the relevant sector **policies** – land use, fisheries, agriculture and National Nutrition Policy
- Develop a specific strategy for **sustainable management** of rice-based ecosystems
- Promote and **raise awareness** of the importance of rice-based ecosystems for the livelihood of the rural people
- Integrate information from this study into the process of drafting the Lao **fisheries legislation**, which is under preparation; first draft expected to be finished mid 2008.

Source: DLF 2007

Fisheries

Current efforts at international level

- The Ramsar Convention is in the process of finalizing a resolution on enhancing biodiversity in rice paddies.
- This resolution will be submitted to the COP10 for adoption.
- The draft resolution calls upon the contracting parties – among other things – to:
  - identify challenges to managing the rice paddies;
  - identify farming practices and water management in rice paddies that would enhance the biodiversity, ecosystem services, and sustainability of rice paddies;
  - ensure that such farming practices and water management are implemented wherever applicable;
  - exchange information about such farming practices and water management with other rice-farming parties.

Fisheries

Objectives of the workshop

- to share information and experiences on importance and management of aquatic biodiversity from rice-based ecosystems among various stakeholders;
- to discuss good management practices which combine the enhancement of aquatic biodiversity with an increase in the production of rice;
- to discuss the role and potential of aquatic biodiversity to alleviate malnutrition;
- to agree on recommendations for future activities and immediate steps to be undertaken in order to achieve an enhancement of aquatic biodiversity and an increased rice production.

Fisheries

Have a good workshop!

Fisheries

Importance of Fish and Other Aquatic Animals in Rice-based Ecosystems in Lao PDR

[Name….]

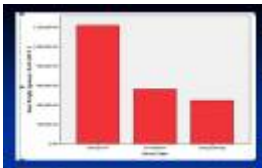
LARReC/FAO

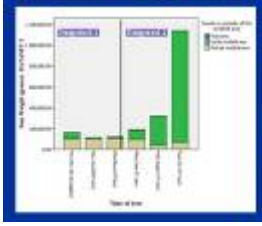
- This research is the result of the Netherlands funded collaboration between:
  - the Living Aquatic Resources Research Centre (LARReC) of the Ministry of Agriculture and Forestry,
  - the Department of Livestock and Fisheries (DLF) in Lao PDR,
  - the Food and Agriculture Organization of the United Nations (FAO)
- Three Provinces representing different topographical and agro-ecological zones in the northern, central and southern parts of the country were selected for study, with 80 households from each:
  - Xiengkhouang province
  - Savanakhet province
  - Champasack province
- Total of 240 households were surveyed on a monthly basis over two separate periods:
  - 1) The end of the wet season and into the dry season (October 2006 – March 2007)
  - 2) the wet season (May – October 2007)

- Data collection:
  - Total 12 rounds (equivalent to 12-days data) of survey were conducted over 2 periods of data collection.
  - Survey was conducted once a month based on the 24 hrs recall
  - Using a household questionnaire, respondents were asked to recall:
    - all the fish and other aquatic animals (OAA's) that had come in to the household in the last 24 hours,
    - where it had come from and how it was subsequently used,
    - how the food had been prepared and eaten, and additional information on household members allowed consumption to be calculated on a Kg/household member basis.

- Data analysis: data have already been analyzed, results will be later described.
- Definitions:
  - *Habitats within the rice fields* include rice field itself, canal/stream/trap pond/natural pond within the rice field area
  - *Habitats outside rice field zone* include rivers/streams, lakes/reservoirs, private ponds, natural ponds outside rice field area, forest

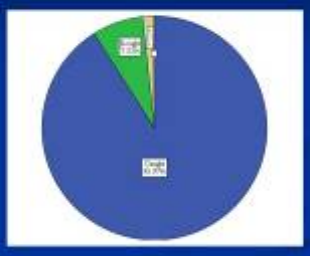
Catches of fish and OAAs



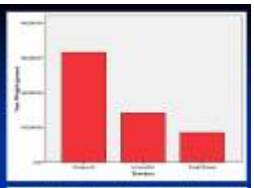


- Most fish is caught at the end of wet season (Sept/October), ~60% of all fish caught throughout the whole year.
- In term of provincial variation, Champasak province has the highest catch (approximately double) comparing to Savanakhet and Xiang Khouang provinces.
- For over all time periods and provinces, ~75% of fish catches came from habitat within rice field areas.
- Consider various time of year, from Oct – Mar, the percentage of catches coming habitats inside of rice field areas decreases with each month and reaching the lowest in Feb/Mar period at ~less than 5%. By May/June period, the percentage of catches coming from inside rice field habitats starts to increase but still less than 50%. But by July onwards, the dominance of rice field habitats is evident with more than 90%.

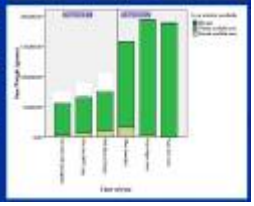
Household acquisition of fish: Where fish acquired by the household is coming from

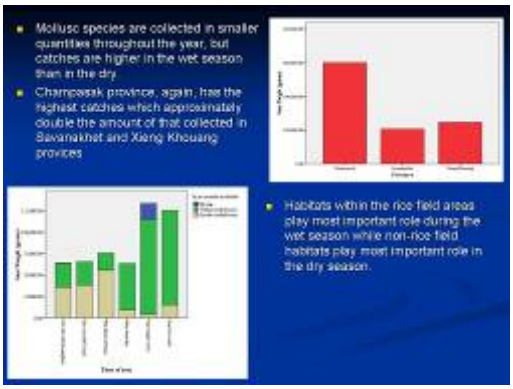


- In terms of quantities collected, amphibians follow fish
- Champasak province is catching the most with approximately double the catches of Savanakhet, while Xieng Khouang has the least catches.

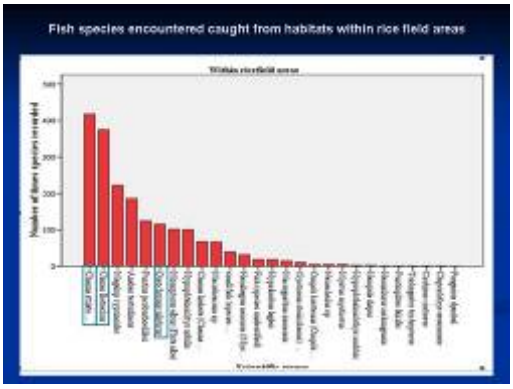


- Over 80% of catch came from rice field habitats in all periods.
- The importance of habitats within rice field areas is even greater than for fish, especially rice fields themselves are the most important habitats for amphibians.
- They are collected most in period from May-October.

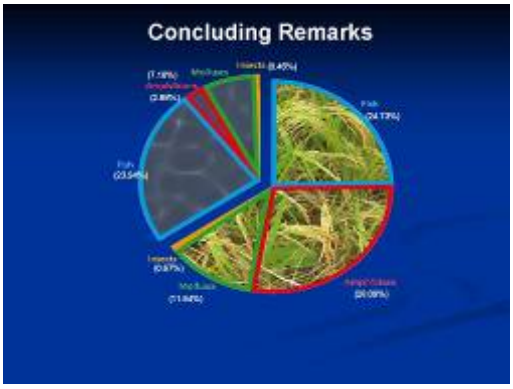


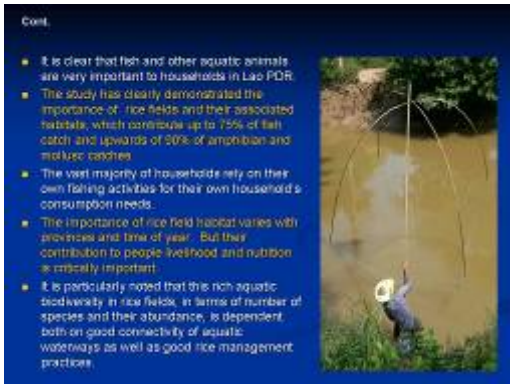

Mollusc species are collected in smaller quantities throughout the year, but catches are higher in the wet season than in the dry
Champasak province, again, has the highest catches which approximately double the amount of that collected in Savanakhet and Xieng Khouang provices
Habitats within the rice field areas play most important role during the wet season while non-rice field habitats play most important role in the dry season.


Species and biodiversity
46 fish species were identified, 27 species were caught within rice field habitats
Channa striata and Clarias batrachus were most commonly encountered than any other species
Exotic species like Oreochromis niloticus was also commonly found
Very few species of amphibian were identified – only 3 actual species
6 mollusc and 3 reptile species were identified, but no actual species of aquatic insects were identified


Fish species encountered caught from habitats within rice field areas

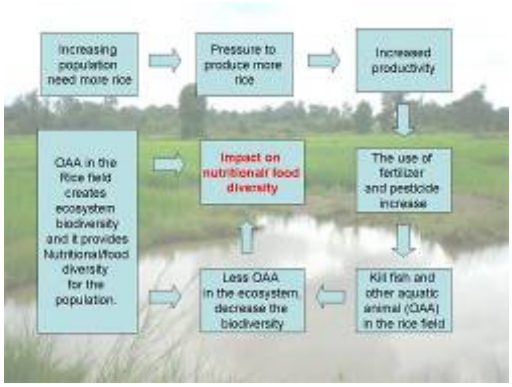

Household consumption
Fish (fresh) are consumed in the greatest quantities, followed by amphibian, molluscs, paddek and aquatic insects
Comparing to other sources of protein, non-process fish (fresh fish) was the most frequently eaten source of animal protein
Average fish (fresh) consumption per adult equivalent unit:
C - 114g/day – 41.6 kg/year
B - 78g/day – 28.6 kg/year
X - 78g/day – 28.4 kg/year

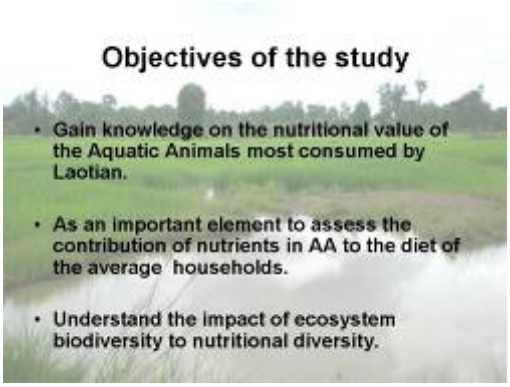

Concluding Remarks


Cont.
It is clear that fish and other aquatic animals are very important to households in Lao PDR
The study has clearly demonstrated the importance of rice fields and their associated habitats, which contribute up to 75% of fish catch and upwards of 50% of amphibian and mollusc catches
The vast majority of households rely on their own fishing activities for their own household's consumption needs
The importance of rice field habitat varies with provinces and time of year. But their contribution to people livelihood and nutrition is critically important
It is particularly noted that this rich aquatic biodiversity in rice fields, in terms of number of species and their abundance, is dependent both on good connectivity of aquatic waterways as well as good rice management practices

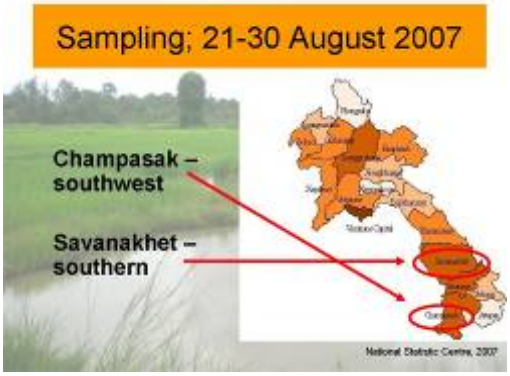

Nutritional Composition of Aquatic Species in Laotian Rice Field Ecosystems:
Possible Impact of Reduced Biodiversity
Mulia Nurhasan, Edel Elvevoll, David James
Penroong Bamrungrach


Increasing population needs more rice
Food security in Laos is generally synonymous with rice availability
80% of total agricultural land is used for growing rice.
Rice production in Laos rose 70% from 1.5 million tonnes (1990) to 2.5 million tonnes (2004)


Increasing population need more rice
Pressure to produce more rice
Increased productivity
The use of fertilizer and pesticide increase
Kill fish and other aquatic animal (OAA) in the rice field
Less OAA in the ecosystem decrease the biodiversity
Impact on nutritional food diversity
OAA in the Rice field creates ecosystem biodiversity and it provides Nutritional/food diversity for the population.

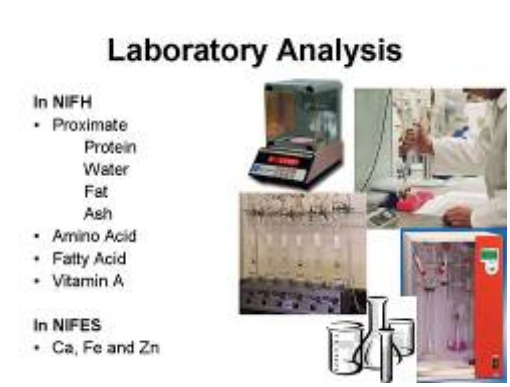

Objectives of the study
Gain knowledge on the nutritional value of the Aquatic Animals most consumed by Laotian.
As an important element to assess the contribution of nutrients in AA to the diet of the average households.
Understand the impact of ecosystem biodiversity to nutritional diversity.

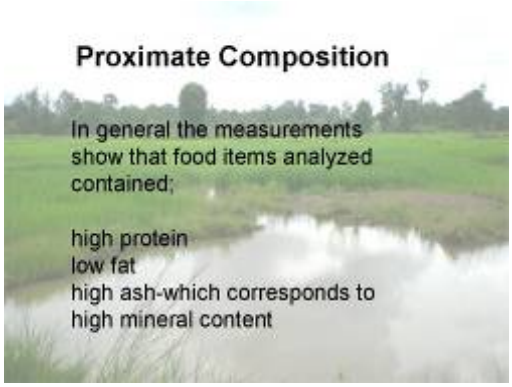

Steps
Data collection
Sampling
Food preparation
Laboratory analyses
Discussion

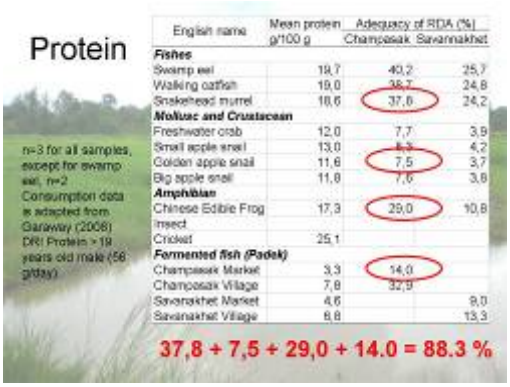

Sampling; 21-30 August 2007
Champasak – southwest
Savanakhet – southern


Sampling Activities
Community Arrangement and Market Sampling

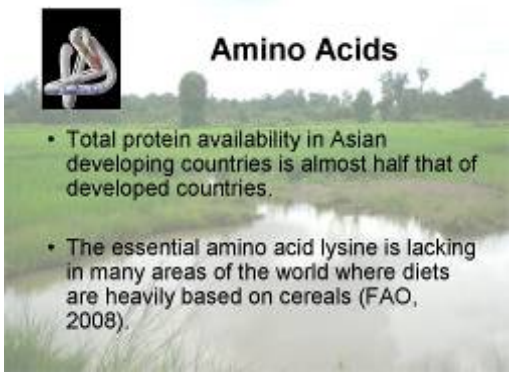

Interview

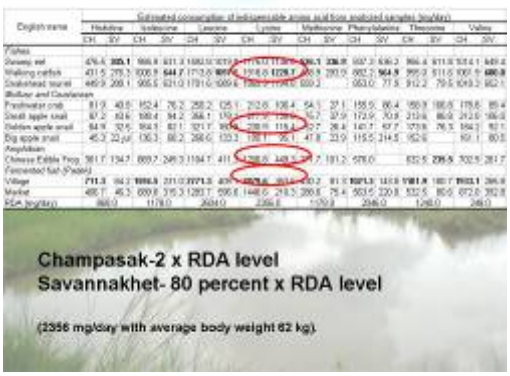






English name	Mean protein g/100 g	Adequacy of RDA (%) Champasak	Savannakhet
Fishes			
Swamp eel	19,7	40,2	25,7
Walking catfish	19,0	38,7	24,8
Snakehead murrel	18,6	37,8	24,2
Mollusc and Crustacean			
Freshwater crab	12,0	7,7	3,9
Small apple snail	13,0	8,3	4,2
Golden apple snail	11,6	7,5	3,7
Big apple snail	11,8	7,6	3,8
Amphibian			
Chinese Edible Frog	17,3	29,0	10,8
Insect			
Cricket	25,1		
Fermented fish (Padek)			
Champasak Market	3,3	14,0	
Champasak Village	7,8	32,9	
Savannakhet Market	4,6		9,0
Savannakhet Village	6,8		13,3





Padek

- Homemade *padek* contained higher nutrient values than market sold *padek*
- *Padek* contained high quality protein and essential amino acids (lysine)

Fatty Acids

Not a good source of fat and fatty acid

Consumption of Fish, OAA and *padek* in Champasak	Omega 6 (mg/day)		Omega 3 (mg/day)	
	min	Max	Min	max
Fish	45.6	285	34.2	171
Mollusc and crustacean	10.8	28.8	7.2	18
Amphibian	56.4	56.4	56.4	56.4
Insect				
Fermented fish	118	259.6	0	0
Total	230.8	629.8	97.6	245.4

4% of AI for linoleic acid (17 g/day)

15% of AI for α-linolenic acid (1.6 g/day)

Minerals

English name	Ca Content WM	Fe Content WM	Zn Content WM
Fishes			
Swamp eel	624.91	1.1	1.41
Walking catfish	298.91	0.62	0.9
Snakehead murrel	70.97	0.33	0.65
Mollusc and Crustacean			
Freshwater crab	6812.4	10.4	3.08
Apple snail 1	1232.5	4.27	6.06
Golden apple snail	444.36	47.99	6.93
Apple snail 2	811.91	102.46	11.6
Amphibian			
Chinese Edible Frog	1266.5	0.88	1.65
Insect			
Cricket	34.33	20.6	8.77
Fermented fish (Padek)			
Champasak Market	90.95	1.29	0.4
Champasak Village	235.44	0.51	0.94
Savanakhet Market	62.62	2.39	0.35
Savanakhet Village	133.99	6.84	0.51

Animals eaten with bones/carapace contained high calcium

The analyzed food items are potential sources of calcium.

Iron

- Iron deficiency is the most common nutritional disorder in the world, including Laos PDR (FAO, 2003).
- The analyzed food items are good sources of iron
- Snails contain the highest level of iron
- Cricket is also a potential source of iron

Zinc

- Laos PDR has a high prevalence of stunting (42.4 percent, IZiNCG, 2008).
- Zinc content of the items analyzed was similar to comparable zinc level presented in CFCD 2002.
- Snails and crickets contained high level of zinc
- Consumption in Champasak could cover up to 84.6% of AI zinc

Vitamin A

- In general fish and OAA analyzed are not good sources of vitamin A.

Conclusion

- Fish and OAA are good sources of protein and amino acids (esp. lysine), calcium, iron and zinc.
- Not the best source of lipids, and vitamin A.
- Methods of preparation influence the nutrient content.
- Homemade *padek* was always a better nutrient source than market *padek*.
- Further research on *padek* and cricket is needed.

Acknowledgements

- UN FAO
- University of Tromso
- NAFRI
- LARREC
- NIFES
- Mahidol University

ກອງປະຊຸມ ກ່ຽວກັບ ຊີວະນາໆພັນ ໃນນາເຂົ້າ ຢູ່ ສປປ ລາວ
ໃນວັນທີ 4-5 ມິຖຸນາ 2008 ທີ່ ໂຮງແຮມ ໂນໂວເທວ.

ບົດລາຍງານ ຂອງ ຂະແໜງການປູກຝັງ ກ່ຽວກັບ ຊີວະນາໆພັນ ໃນນາເຂົ້າ ຢູ່ ສປປ ລາວ.

ບົດລາຍງານ ຂອງ ຂະແໜງການປູກຝັງ ກ່ຽວກັບ ຊີວະນາໆພັນ ໃນນາເຂົ້າ ຢູ່ ສປປ ລາວ.

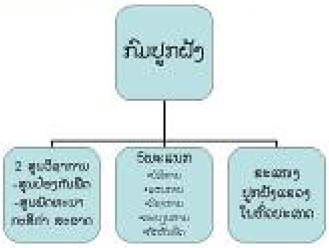
1. ສະພາບລວມ
2. ໂຄງການທີ່ສະໜັບສະໜູນ ກ່ຽວກັບ ຊີວະນາໆພັນ ໃນນາເຂົ້າ
3. ຂໍ້ຫຍຸ້ງຍາກ
4. ແຜນການໃນຕໍ່ໜ້າ

I. ສະພາບລວມ

1. ໂຄງປະກອບ ການຈັດຕັ້ງ ຂອງກົມປູກຝັງ
2. ການຜັນຂະຫຍາຍນະໂຍບາຍ
3. ການສະໜັບສະໜູນຂອງຂະແໜງການປູກຝັງ

I. ສະພາບລວມ

1. ໂຄງປະກອບ ການຈັດຕັ້ງ ຂອງກົມປູກຝັງ



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2. ການຜັນຂະຫຍາຍນະໂຍບາຍ

ສປປລາວ ມີນະໂຍບາຍ ການຜະລິດ ກະສິກໍາ ໃຫ້ໝັ້ນຄົງ,ຍືນຍົງ,ສະອາດ, ປອດສານພິດ ຕົ້ນທຶນການຜະລິດຕໍ່າ.ການຜະລິດ ກະສິກໍາ ໃຫ້ໝັ້ນຄົງ ຍືນຍົງ ແມ່ນ ການນໍາໃຊ້ຊັບພະຍາກອນ ທໍາມະຊາດເຂົ້າສູ່ການຜະລິດ ກະສິກໍາ ເຊັ່ນ: ດິນ, ນໍ້າ, ປ່າໄມ້ ແມ່ນ ຈະບໍ່ຫຼີກແຫຼ່ງ. ນອກຈາກນັ້ນ ຍັງປົກປັກຮັກສາ ຊັບພະຍາກອນ ເຫຼົ່ານີ້ ຢ່າງໝັ້ນຄົງຍາວນານ.

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3. ການສະໜັບສະໜູນຂອງຂະແໜງການປູກຝັງ

II. ໂຄງການທີ່ ສະໜັບສະໜູນ ກ່ຽວກັບ ຊີວະນາໆພັນ ໃນນາເຂົ້າ

- ໂຄງການປ້ອງກັນພືດ ແບບປະສົມປະສານ (FAO Inter Country Programme for IPM in vegetable in South and Southeast Asia)
- ໂຄງການນໍາໃຊ້ ແລະ ອະນຸລັກ ຊີວະນາໆພັນພືດ(Biodiversity Use and Conversation Asia Program-BUCAP)
- ໂຄງການຜະລິດເຂົ້າອິນຊີ (Promotion of Organic Rice)

ໂຄງການປ້ອງກັນພືດ ແບບປະສົມປະສານ (FAO Inter Country Programme for IPM in vegetable in South and Southeast Asia)

- ຜູ້ໃຫ້ທຶນ: ອົງການ FAO
- ໄລຍະດໍາເນີນໂຄງການ: ສໍາລັບ IPM ຂອງເຂົ້າ
  1996-2001 (GCP/RAS/160/NET)
  1999-2002(GCP/RAS/172/NOR)
- ພື້ນທີ່ຈັດຕັ້ງປະຕິບັດ: 8 ແຂວງ
  - ຫຼວງພະບາງ
  - ວຽງຈັນ
  - ນະຄອນຫຼວງວຽງຈັນ
  - ບໍລິຄໍາໄຊ
  - ຄໍາມ່ວນ
  - ສະຫວັນນະເຂດ
  - ສາລະວັນ
  - ຈໍາປາສັກ

ໂຄງການປ້ອງກັນພືດ ແບບປະສົມປະສານ (FAO Inter Country Programme for IPM in vegetable in South and Southeast Asia)

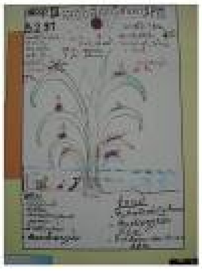
- ກິດຈະກຳຫຼັກ
  - ສ້າງຄວາມເຂັ້ມແຂງ ໃຫ້ແກ່ພະນັກງານ ແຂວງ ແລະ ເມືອງ ດ້ານການປ້ອງກັນພືດ ແບບປະສົມປະສານ.
  - ຝຶກອົບຮົມ ຊາວນາ ໃຫ້ຮູ້ຈັກ ກ່ຽວກັບ ວິທີການປູກພືດ ເພື່ອໃຫ້ຕົ້ນພືດມີຄວາມແຂງແຮງ.
  - ສ້າງຄວາມເຂັ້ມແຂງໃຫ້ແກ່ ຊາວກະສິກອນ ໃນ ການ ຈຳແນກ ສັດຕູພືດ ແລະ ສິ່ງທີ່ເປັນປະໂຫຍດ ໃນນາເຂົ້າ.
  - ສ້າງໃຫ້ຊາວນາ ຮູ້ຈັກ ອະນຸລັກ ສິ່ງແວດລ້ອມ ແລະ ຫຼຸດຜ່ອນ ການນຳໃຊ້ ຢາຂ້າສັດຕູພືດ ດ້ວຍຕົວ ຊາວນາເອງ.

ໂຄງການປ້ອງກັນພືດ ແບບປະສົມປະສານ (FAO Inter Country Programme for IPM in vegetable in South and Southeast Asia)

- ຜົນໄດ້ຮັບ
  - ມີຊາວນາເຂົ້າຮ່ວມ ຈຳນວນ 3,000 ກວ່າຄົນ.
  - ມີພະນັກງານ ວິຊາການ ຂັ້ນແຂວງ ແລະ ເມືອງ ທີ່ມີປະສົບການ ຈຳນວນ 60 ກວ່າຄົນ.
  - ມີປຶ້ມຄູ່ມື, ແຜ່ນພັບ, ໂປດສະເຕີ ກ່ຽວກັບ ວຽກງານ ການປ້ອງກັນພືດ ແບບປະສົມປະສານ ໃນນາເຂົ້າ.
  - ມີຊາວນາ ທີ່ມີປະສົບການ ໃນການປູກເຂົ້າ, ພ້ອມທັງຮູ້ຈັກ ອະນຸລັກ ສິ່ງແວດລ້ອມ ແລະ ຫຼຸດຜ່ອນ ການນຳໃຊ້ສານເຄມີປາບສັດຕູພືດ.

ຄວາມສຳພັນ ຂອງອົງປະກອບ ຕ່າງໆ ຢູ່ໃນທົ່ງນາ ທຳມະຊາດ

ລະບົບ ນິເວດ ວິທະຍາ ໃນນາເຂົ້າ



ຊາວກະສິກອນ ຮູ້ຜ່ານ ການຝຶກອົບຮົມ ມີຄວາມສາມາດດັ່ງລຸ່ມນີ້:

- ສຳຫຼວດລະບົບນິເວດ.
- ເກັບກຳຂໍ້ມູນຕາມຈະເລີນເຕີບໂຕຂອງພືດ.
- ວິເຄາະລະບົບນິເວດ.
- ໃຫ້ຄຳແນະນຳ ແລະ ວາງແຜນ ກິດຈະກຳ ທີ່ຈະປະຕິບັດ ຢູ່ໃນທົ່ງນາ.

ໂຄງການອະນຸລັກ ແລະ ນຳໃຊ້ຊີວະນາໆພັນພືດ (Biodiversity Use and Conservation Asia Program-BUCAP)

- ຜູ້ໃຫ້ທຶນ: ອົງການ SEARICE(The South East Asia Regional Institute for Community Education)
- ໄລຍະດຳເນີນໂຄງການ: ໄລຍະທີ I: 2000-2005
  ໄລຍະທີ II: 2006-2008
  ໄລຍະທີ III: 2009-2011
- ພື້ນທີ່ຈັດຕັ້ງປະຕິບັດ: 4 ແຂວງ ຄື: ຫຼວງພະບາງ, ວຽງຈັນ, ສະຫວັນນະເຂດ ແລະ ຈຳປາສັກ.
- ກິດຈະກຳຫຼັກ: 1) ຟື້ນຟູພັນພືດທ້ອງຖິ່ນ
  2) ຄັດເລືອກພັນທີ່ເໝາະສົມກັບທ້ອງຖິ່ນ
  3) ປູກອະນຸລັກພັນທີ່ຫຼາກຫຼາຍ
  4) ປະສົມພັນດ້ວຍຕົວຊາວນາເອງ
  5) ປູກທົດລອງ(ທົດລອງ ດ້ານຜົນຜະລິດ ແລະ ຄຸນລັກສະນະອື່ນໆ)

ໂຄງການອະນຸລັກ ແລະ ນຳໃຊ້ຊີວະນາໆພັນພືດ (Biodiversity Use and Conservation Asia Program-BUCAP)

ໂຄງການອະນຸລັກ ແລະ ນຳໃຊ້ຊີວະນາໆພັນພືດ (Biodiversity Use and Conservation Asia Program-BUCAP)

- ຜົນໄດ້ຮັບ
- ມີຊາວນາເຂົ້າຮ່ວມ 590 ຄົນ.
- ມີພະນັກງານ ແຂວງ, ເມືອງ ທີ່ມີປະສົບການ 50 ຄົນ.
- ມີແນວພັນ ຢູ່ພື້ນທີ່, ຊຶ່ງຊາວນາ ສາມາດຄັດເລືອກໄດ້ເອງ ແລະ ສາມາດເກັບຮັກສາ ແລະ ນຳໃຊ້ໄດ້ ໃນສູນເກັບແນວພັນ ປະມານ 70 ກວ່າສາຍພັນ.
- ມີຊາວນາ 15 ຄົນສາມາດ ປະສົມພັນເອງໄດ້ ແລະ ມີຄວາມສາມາດ ສອນຄົນອື່ນໄດ້.

ໂຄງການຜະລິດເຂົ້າອິນຊີ (Promotion of Organic Rice -ProRice)

- ຜູ້ໃຫ້ທຶນ: ອົງການ Helvetas, ປະເທດ Switzerland.
- ໄລຍະດຳເນີນໂຄງການ: 2006-2008.
- ກິດຈະກຳຫຼັກ:
1) ຈັດຕັ້ງກຸ່ມຜູ້ປູກ (ກຸ່ມຊາວນາ) ແລະ ກຸ່ມຜູ້ປຸງແຕ່ງ(ກຸ່ມໂຮງສີ).
2) ຝຶກອົບຮົມ ດ້ານເຕັກນິກວິຊາການ.
3) ສະໜັບສະໜູນການ ເຊື່ອມຕໍ່ລະຫວ່າງຊາວນາ ແລະ ຜູ້ປະກອບການ.
4) ສະໜັບສະໜູນ ວຽກງານການຜະລິດ ແລະ ການປຸງແຕ່ງເຂົ້າ.
5) ນຳພາຜູ້ປະກອບການເຂົ້າເຖິງຕະຫຼາດ.

ແນວທາງໃນການຈັດຕັ້ງປະຕິບັດ

ໂຄງການຜະລິດເຂົ້າອິນຊີ (ProRice)

III. ຂໍ້ຫຍຸ້ງຍາກ

- ນິຕິກຳ(ຂໍ້ກຳນົດ, ກົດລະບຽບ) ທີ່ກ່ຽວຂ້ອງ ກັບ ຂະແໜງການ ປູກຝັງ ຍັງມີຈຳກັດ, ການໂຄສະນາ ເຜີຍແຜ່ ກ່ຽວກັບ ຂໍ້ກຳນົດກົດລະບຽບຕ່າງໆ ຍັງບໍ່ທັນ ກວ້າງຂວາງ.
- ພະນັກງານ ວິຊາການ ສະເພາະດ້ານ ຍັງມີ ຈຳກັດ ທາງດ້ານປະລິມານ ແລະ ຄຸນນະພາບ.
- ຊາວກະສິກອນ ຈຳນວນໜຶ່ງຍັງ ບໍ່ທັນເຂົ້າໃຈ ກ່ຽວກັບ ຄວາມອັນຕະລາຍ ຂອງຢາ ປາບສັດຕູພືດ.

IV. ແຜນການໃນຕໍ່ໜ້າ

- ສົມທົບ ສ້າງ ແລະ ປັບປຸງນິຕິກຳ ທີ່ກ່ຽວຂ້ອງ ກັບຂະແໜງການປູກຝັງ ໃຫ້ແທດເໝາະກັບ ສະພາບການໃນປະຈຸບັນ, ລວມການທັງ ໂຄສະນາ ເຜີຍແຜ່ ນິຕິກຳ ດັ່ງກ່າວ.
- ສືບຕໍ່ຜັນຂະຫຍາຍ ນະໂຍບາຍ ການຜະລິດ ກະສິກຳ ສະອາດ.
- ໂຄສະນາເຜີຍແຜ່ ກ່ຽວກັບ ຄວາມອັນຕະລາຍ ໃນການນຳໃຊ້ຢາປາບສັດຕູພືດ.

Weekend Market **(Every Sat)**

ຂໍຂອບໃຈ

Survey project
SURE

(Sustainable Utilization of Rice Field Ecosystem)

Phase 1: Rice field ecosystem in Vientiane plain
(June 2007 – March 2009)

Interim report

Objectives

- To make a list of animals and plants living in rice field ecosystem
- To collect information on utilization of animals and plants in rice field ecosystem by the people
- To raise awareness of the people on the importance of rice field ecosystem
- To build human capacity on ecological survey and awareness raising activities

Implementing agencies

- Main agency:
  Aquaculture Improvement and Extension Project Phase 2 (AQIP2), DLF
- Collaborating agency:
  Volunteer student groups and the Center for Environment and Development Studies, National University of Laos (NUOL group)
- Aiding agency:
  Nagao Environment Foundation and NARC, Japan

Target site

20 villages in Naxaithong district, Vientiane Capital

Activities

1. Collection of aquatic animals and plants by 20 primary school children at each target village

Fishing gears to collect aquatic animals

Activities

2. Awareness raising campaign on rice field ecosystem protection

2-1. Activities by NUOL group

2. Awareness raising campaign on rice field ecosystem protection

2-2. Tools for the campaign

Kamisibai (paper theater) prepared by NUOL group

Activities

3. Sorting of collected organisms and keeping samples

4. Taxonomical identification of samples

Activities

5. Interview survey to villagers on utilization of aquatic animals and plants

Activities

6. Training on survey method, sample making and taxonomical identification of aquatic organisms by Japanese experts

Results-1

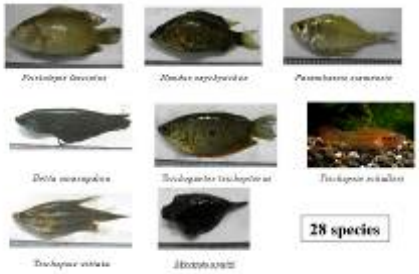
Collected fishes: Cyprinidae

Results-2

Collected fishes: Other than Cyprinidae

Results-3

Collected fishes: Other than Cyprinidae



28 species

Results-4

Collected insects

Results-5

Collected insects

Results-6

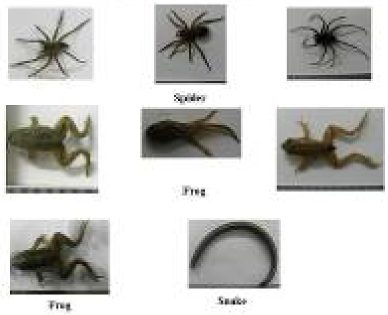
Collected insects

Results-7

Collected other animals

Results-8

Collected other animals



Results-9

Fishes collected at each village

Family	Species	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Phattana	Tham	Nongsa	Bousa
Cyprinidae	[illegible]	O		O						
	[illegible]			O	O					
	[illegible]				O	O				
	[illegible]	O	O	O	O	O	O	O	O	O
	[illegible]		O							
	[illegible]								O	
	[illegible]	O	O			O				
	[illegible]	O								
	[illegible]				O	O				
	[illegible]	O		O		O				O
	[illegible]	O							O	
Ambassidae	[illegible]	O		O		O			O	
Anabantidae	Anabas testudineus	O			O				O	
Belonidae	[illegible]				O			O		
Channidae	Channa striata	O						O	O	O
	Channa gachua	O	O			O	O			
Clariidae	[illegible]	O			O					
[illegible]	[illegible]				O	O				O
[illegible]	[illegible]					O				O
Nandidae	[illegible]		O					O		
	[illegible]		O		O			O	O	
[illegible]	[illegible]			O						
Osphronemidae	[illegible]	O	O			O				
	[illegible]	O	O		O	O				O
	[illegible]	O	O	O	O	O			O	O
	[illegible]							O	O	
Siluridae	[illegible]				O				O	O
Synbranchidae	[illegible]		O	O						

Results-10

Results of interview survey by NUOL group

Frequency and amount of collection of aquatic animals by villagers

Village	Average frequency/yr /HH	Average catch(kg)/time /HH	Total annual catch(kg)/HH
Tham	93.4	1.3	118.1
Phattana	80.0	0.9	74.0
Nongsa	56.5	1.4	79.5
Bousa	51.1	0.9	45.7

Results of interview survey by NUOL group

Season of collection of aquatic animals by villagers

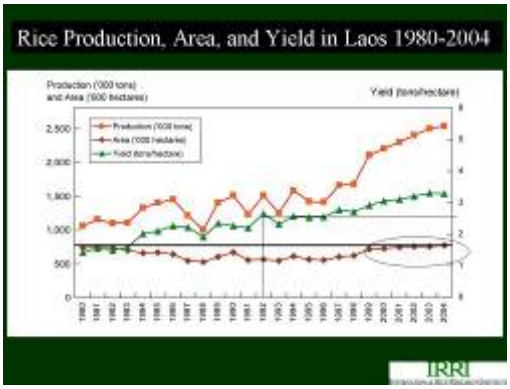
Village	Rainy season Number of HH (%)	Dry season Number of HH (%)
Tham	15 (93.8)	10 (62.5)
Phattana	18 (100.0)	16 (94.4)
Nongsa	15 (100.0)	8 (53.3)
Bousa	14 (87.5)	14 (87.5)

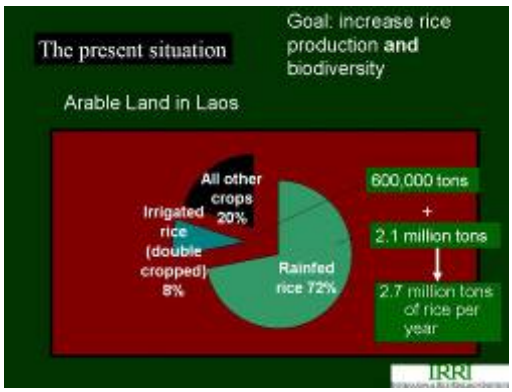
Thank you very much!

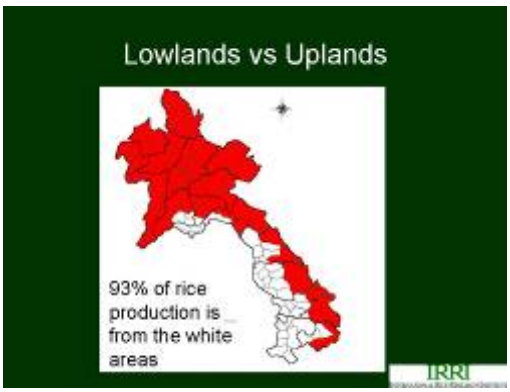

More Than Rice Itself:
Rice, Fish, and Aquatic Biodiversity
Gary Jahn
International Rice Research Institute
IRRI
&
Kevin Kamp
Swiss Development and Cooperation


Presentation outline
• Goals
• Rice situation in Lao PDR
• By Ecosystem:
– Irrigated
– Upland
– Rainfed lowland
• Aquatic resources produced
• Intensification Strategy & Issues
• Strategy for aquatic agrobiodiversity enhancement
IRRI

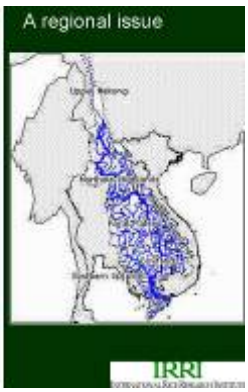

• Avoid the "conflict" mentality of agriculture vs environment.
We can do both!

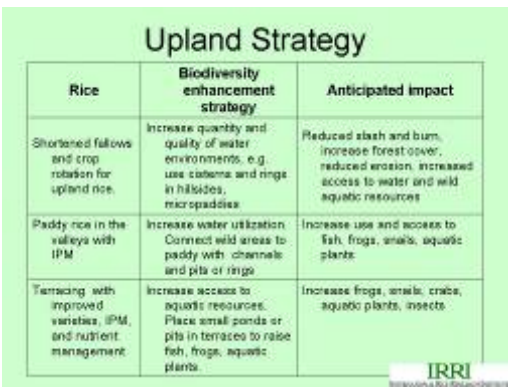

Rice Production, Area, and Yield in Laos 1980-2004
IRRI

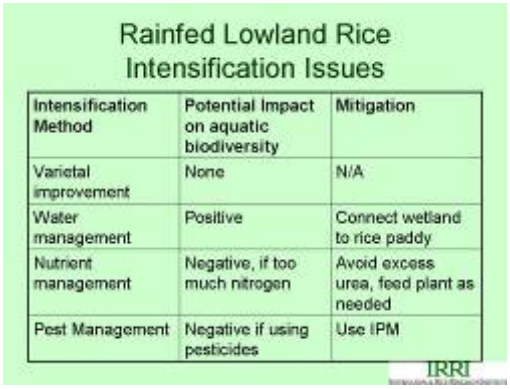

The present situation
Goal: increase rice production and biodiversity
Arable Land in Laos
All other crops 20%
Irrigated rice (double cropped) 8%
Rainfed rice 72%
600,000 tons
+
2.1 million tons
2.7 million tons of rice per year
IRRI


Lowlands vs Uplands
93% of rice production is from the white areas
IRRI


Biodiversity Conservation Landscapes


A regional issue
IRRI


Upland Strategy
Rice
Biodiversity enhancement strategy
Anticipated impact
Shortened fallows and crop rotation for upland rice.
Increase quantity and quality of water environments, e.g. use caterns and rings in hillsides, microparadises
Reduced slash and burn, increase forest cover, reduced erosion, increased access to water and wild aquatic resources
Paddy rice in the valleys with IPM
Increase water utilization. Connect wild areas to paddy with channels and pits or rings
Increase use and access to fish, frogs, snails, aquatic plants
Terracing with improved varieties, IPM, and nutrient management
Increase access to aquatic resources. Place small ponds or pits in terraces to raise fish, frogs, aquatic plants.
Increase frogs, snails, crabs, aquatic plants, insects
IRRI



Intensification Method	Potential Impact on aquatic biodiversity	Mitigation
Varietal improvement	None	N/A
Water management	Positive	Connect wetland to rice paddy
Nutrient management	Negative, if too much nitrogen	Avoid excess urea, feed plant as needed
Pest Management	Negative if using pesticides	Use IPM


LOCAL HARVESTING/ENHANCEMENT STRUCTURES in wetlands


Traditional Enhancement Structures
Protection in fallow rice field


Traditional Enhancement Structure
• **Refuge** for fish in the dry season.
• **Source** of fish for the rice field in the wet season.
• Emergency food **reserve** in dry season.
• **Catching** fish in wet season


Connecting it all…
Protected Sanctuary
Community Capture Ponds
Permanent Water
Annual Wetlands
Rice fields


Summary of strategy to intensify rice and enhance aquatic biodiversity
• Preserve current wetlands
• No expansion of wet season rice area
• Intensify wet season rice
• Link wetlands to rice paddies
• Expand dry season area, enhancing aquatic habitats for biodiversity, e.g. eco-friendly canals (*ecology & economic*)
• Sustainable production in uplands with systems to capture water and link to wild resources
IRRI


Thank You

ARL Xe Kong Basin Project
Paticipatory Fishery Monitoring
- Analysis of Rice Field Fisheries

DLF/FAO
Workshop on Rice Field Biodiversity

for a living planet

Participatory Fisheries Monitoring

- 25 households
- Started in Sept '07

- All household fishing activity documented for a full day
- Recorded every Friday

for a living planet

Information Collected Includes:

1. Fish Habitats
2. Fish Species
3. Occurrence of migration and spawning
4. Seasonality of fishing
5. Fishing Gears
6. Levels of Yield
7. Consumption vs. sale
8. Location of fishing

for a living planet

5 Locations Across the Xe Kong Basin

for a living planet

Analysis for Rice Field Fishery

- **"Rice Field Fishery"** includes rice fields and adjacent flood plain water bodies (ponds, ditches, streams)
- **3 Villages (15 Households)** included in the analysis – (2 villages did not have access rice fields, practice upland cropping)
- Initial look at 6 months of data (Sept to Feb) – **Survey and Analysis is not complete**

for a living planet

Data Collected

412 data entries recorded.

119 data entries from rice field environments (29%)

*Roughly represents effort

for a living planet

Catch

- *Total of 529.8 kg reported*
- *143.5 kg reported from rice fields (27%)*

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Fish Species

Total of 79 species reported

23 (29%) species reported from rice fields, including 5 non-fish aquatic animals

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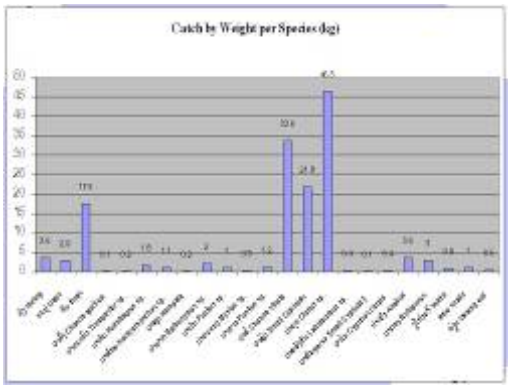

Fishing Gears

- Total of 16 gears reported as used
- 10 gears reported as used in rice fields

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Market/consumption

- 46% (243. kg) of over-all catch sold
- 45% (64.6 kg) of rice field catch sold

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Conclusions and Comments

- The rice field fishery represents a significant portion of the fishing effort and capture fishery production in many villages.
- The aquatic biodiversity in rice field environments includes a wide range of aquatic animals
- Aquatic animal production from rice field environments make up a significant part of the diet in households included in this study.

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Thank You

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Lao PDR
Thailand
Battambang Province
CAMBODIA
Mekong
Great Lake
Study Area (Figure 2)
Tonle Sap
Phnom Penh
Viet Nam
Gulf of Thailand
Mekong Delta


Early wet season – July, harrowing and planting


Middle of wet season - October


Early dry season - December


Dry season catches - unquantified


Few ponds ~1 per 20 ha


Trap ponds in Kandal, SE Cambodia – not in Battambang


Dry season Jan-May

Wet-season rainfed rice, traditional, 5-7 months

Objectives

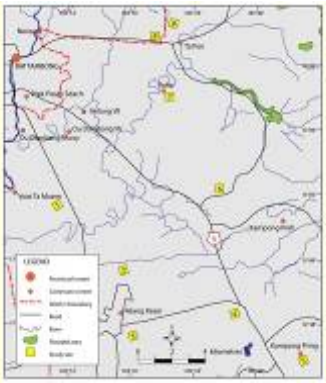
- Estimate catch (yield) - kg/ha/season
- Estimate standing crop – kg/ha
- Estimate value of the catch ($/ha)

Other studies' estimates are per household or are very approximate for area, not easy to compare with agricultural data on production.

- Evaluate the significance for Mekong basin fisheries yield generally.

Methods

- Weigh and measure catches by fishers – from ricefields and other habitats in 25 hectare plots (500 x 500 m) to estimate catches (kg/hectare/season). (4-times/month for 7 months, July - February).
- Pump 1-hectare ricefields dry to estimate standing crop (kg/hectare of fish and OAAs). (2 times during Sept-Nov).
- Collect market prices for fish and OAAs from Battambang market.
- Interview fishers about socio-economic aspects.



Weighing and measuring catches


Planning for standing crop assessment

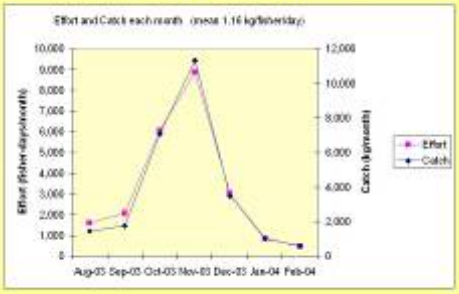

About 47% of
total catch was
from traps

About 25% of all catches by hook and line, most by set lines


About 10% of the catch was from cast nets


Only 5% was from gill nets

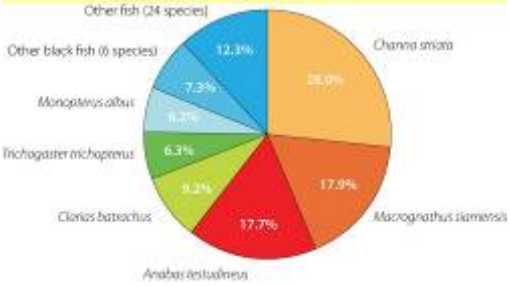
Total effort and catch (9x25 ha)



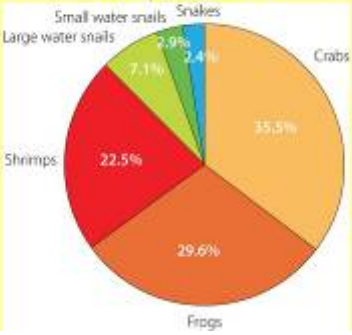
Fishing activities

- Most effort and catch is in Oct-Nov when rice is vegetative, not during the recession.
- Fishing complements other activities.
- Fishing provides food prior to big catches from Tonle Sap – Great Lake recession.
- 82% males, 90% >15 years.
- Most households, 1-2 persons fishing

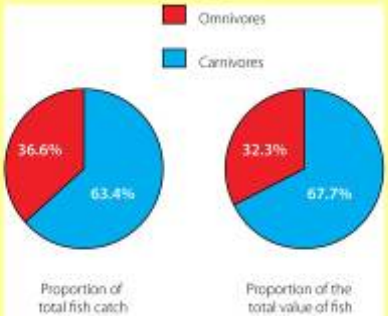
77% of catch is fish, 35 species, black fish are dominant



23% of catch is other aquatic animals – OAAs, 6 main taxa



Carnivores are dominant



Value

- Prices $0.05-$1.36/kg Mean $0.87/kg
- Large carnivores >$1.20/kg
- Omnivores, crabs, snails low value

Catch (yield) 25 ha

Total catch : **119 kg/ha/season (67-162)**
Fish : 91 kg/ha/season (77% of catch, 89% of value
OAAs : 28 kg/ha/season (23% of catch, 11% of value)

Value : $101/ha gross
Rice : $150/ha gross profit
Fishery could become more profitable than rice farming.

About 1 kg/fisherday on average

Consistent with other studies in the Mekong Basin
50 - >200 kg/ha/year. See review in report.

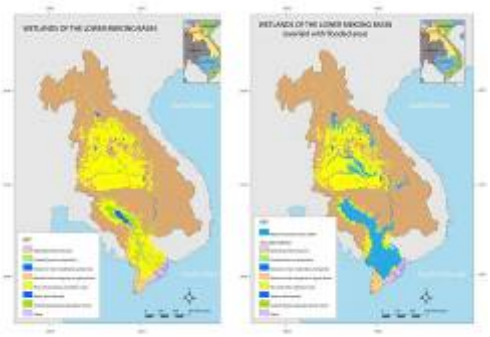
About 2 kg/household/day, of which half is sold. Consistent with other studies.

Standing crop in ricefields (1 ha plots)

- Mean 65 kg/ha (40-86 kg/ha)
- Consistent with catch estimate
- About 30% OAAs and more carnivorous fish than in catches
- Growth rate of fish 2-4 cm/month
- Most fish are small, in 1st year of life

Implications for basinwide yield

- Wet-season rainfed rice is the largest area of aquatic habitat in Cambodia and the Mekong basin.
- Fisheries yield from ricefields is probably underestimated everywhere. In Cambodia yield could be 33,600 km^2 x 10 t/km^2 = 336,000 tonnes/year. In the LMB, ricefields habitat covers at least 140,000 km^2……
- For any large-scale assessment, land-use data include other habitats within ricefields because resolution is typically ~ 25 ha. Ricefield habitat is typically 1.5 x ricefield planted area.



Opportunities to increase fisheries yield

- Ricefield habitats offer the greatest opportunities to increase fishery yield, e.g. via traditional trap/refuge pond systems.
- Black fish and frogs should be given more attention, multiple benefits:

  - indigenous, little management needed, no loss of crop area,
  - simple to build trap ponds and improve connectivity to increase production,
  - there are other possible benefits such as pest control,
  - black fish and frogs are not affected by oxygen depletion, and are more valuable and culturally acceptable than introduced omnivores (as used in 'rice-fish' systems),
  - they are hardy and can be transported alive, no need for refrigeration.

Constraints to increasing ricefield capture fisheries production

Any project developing rice-fish production should take into account that:

- The wild fish are state-owned, common property and targeted by anyone. Farmers will not invest in them.
- Land-holdings are small and fragmented. Management of farming systems, including the fisheries, and security of production are problems.
- Capital costs e.g. of pond construction and management.
- The basis of production is not well understood
  - "the 10% rule for food chains".

If these constraints are not overcome we wil see increasing problems with nutrition, food security and livelihoods. Population is continuing to grow, e.g. in Cambodia now about 14 million.

Development of Fisheries Legislation for Lao PDR

Rice field fisheries and related legislation

Phouviseng Latdavong
Deputy Director General NAFRI
4-5 June 2008
DLF – FAO Workshop on Aquatic Biodiversity in Rice Field Ecosystems

Fisheries Legal Framework

- *Development of fisheries legislation began in September 2007*
- *Single legislation for capture fisheries and aquaculture*
- *Consultative process with support from FAO*

Fisheries Legal Framework

Objective of the law is to facilitate the development of the fisheries sector (capture fisheries and aquaculture) to contribute to poverty reduction, food security, and economic growth in Lao PDR through the sustainable utilization of aquatic resources and the promotion of adaptive and effective management mechanisms

Fisheries Legal Framework

Article X – fishing in rice fields

No person shall engage in fishing in any rice field unless they have authorization of the field owner (holder of land use right to the field)

Fisheries Legal Framework

Article X – fishing in rice fields

In circumstances where an area is flooded, any person may fish in submerged rice fields without permission if water level is high enough to cover the bunds of the field

Fisheries Legal Framework

Article X – Ownership of aquatic organisms

The property of wild fish and OAA is the property of the national community, including those wild aquatic organisms found on private property (ponds, rice fields)

Fisheries Legal Framework

Article X – Ownership of aquatic organisms

Stocked fish belong to the field owner.

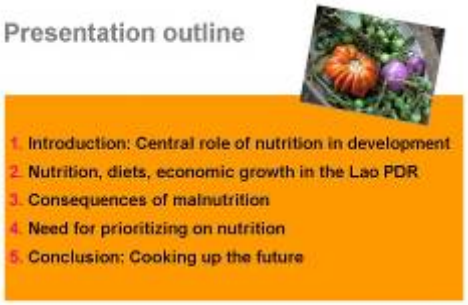
The owner of the field has inherent right to catch the wild fish and OAA. Other fishers must receive permission to harvest wild fish and OAA on private property from the owner.

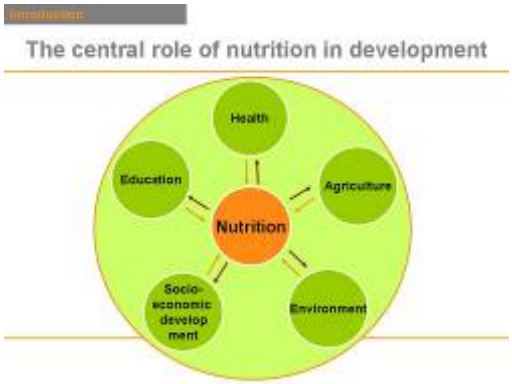
Fisheries Legal Framework

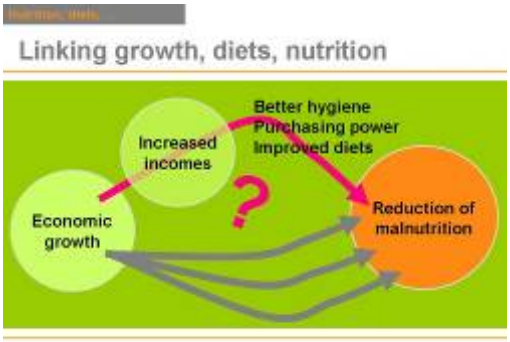
Article X – Ownership of aquatic organisms

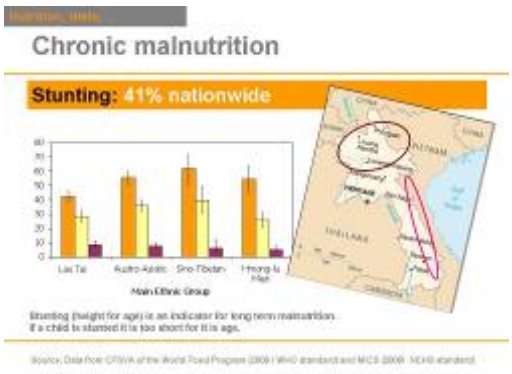
In situations where the rice field is flooded and wild fish and OAA are moving across the floodplain, the field owner is no longer entitled to exclusive fishing rights to the field, and permission to fish on private land is not required.


Cooking up the future:
Nutrition and economic growth in the Lao PDR
2020
Past
Today

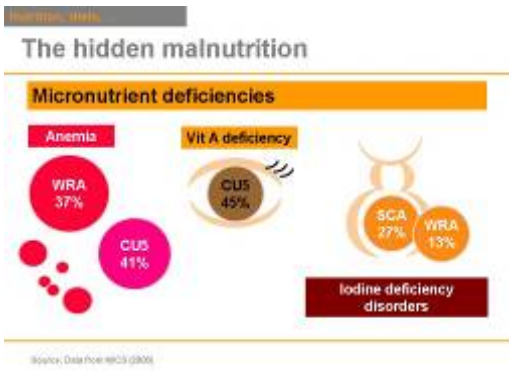

Presentation outline
1. Introduction: Central role of nutrition in development
2. Nutrition, diets, economic growth in the Lao PDR
3. Consequences of malnutrition
4. Need for prioritizing on nutrition
5. Conclusion: Cooking up the future

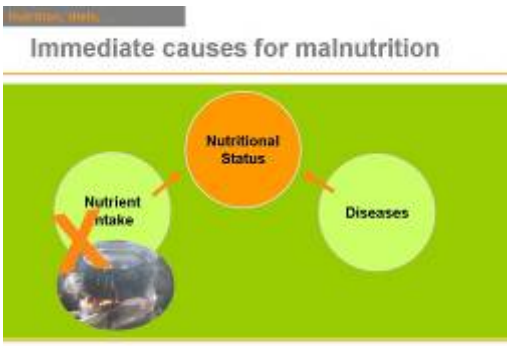

The central role of nutrition in development
Health
Education
Agriculture
Nutrition
Socio-economic develop ment
Environment

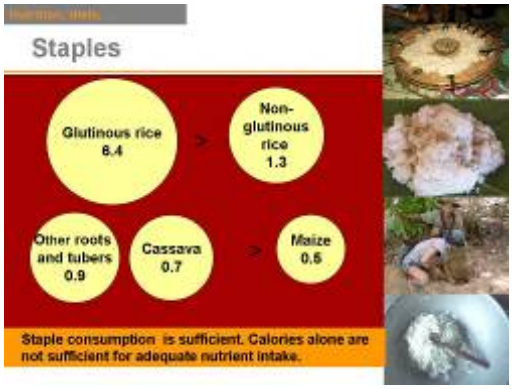

Linking growth, diets, nutrition
Increased incomes
Better hygiene
Purchasing power
Improved diets
Economic growth
?
Reduction of malnutrition

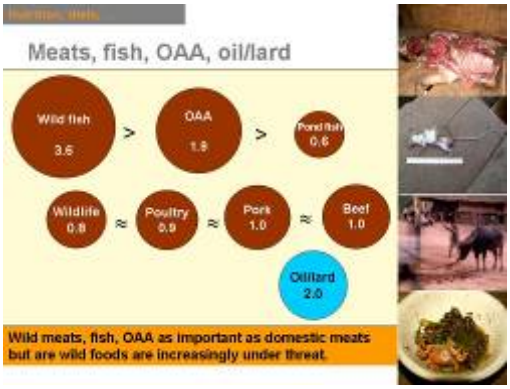

Chronic malnutrition
Stunting: 41% nationwide
Main Ethnic Group

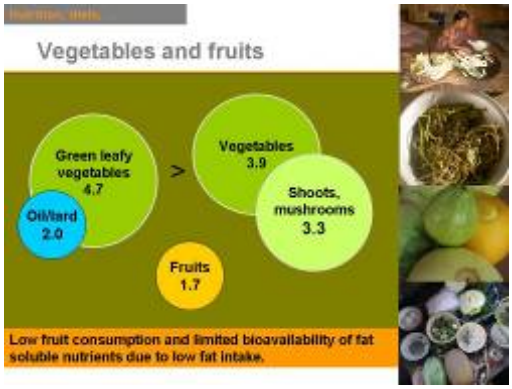

Acute malnutrition and underweight
Wasting: 7% nationwide
Underweight: 38% nationwide

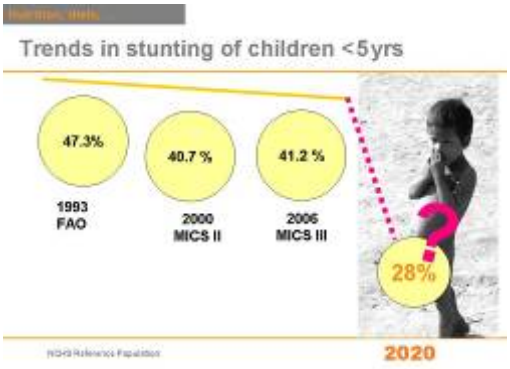

The hidden malnutrition
Micronutrient deficiencies
Anemia
WRA 37%
CU5 41%
Vit A deficiency
CU5 45%
SCA 27%
WRA 13%
Iodine deficiency disorders

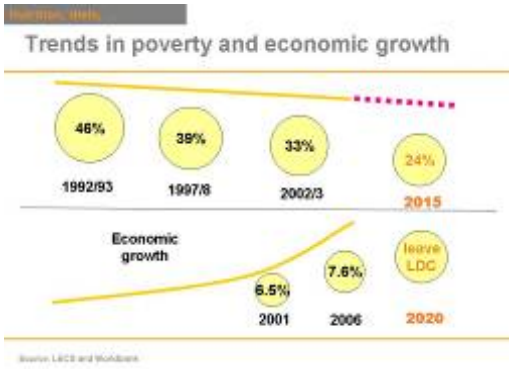

Immediate causes for malnutrition
Nutritional Status
Nutrient intake
Diseases

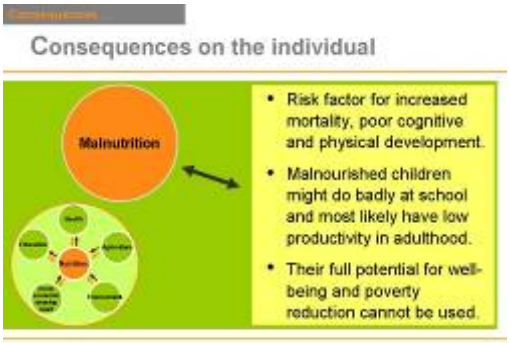

Staples
Glutinous rice 8.4
Non-glutinous rice 1.3
Other roots and tubers 0.9
Cassava 0.7
Maize 0.6
Staple consumption is sufficient. Calories alone are not sufficient for adequate nutrient intake.

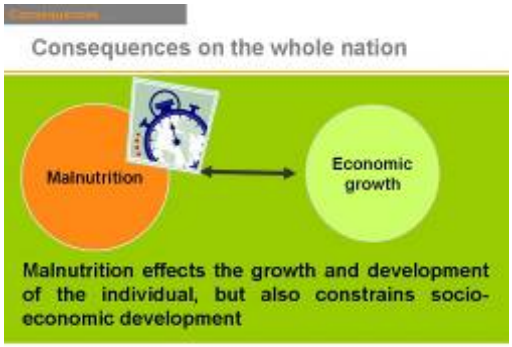

Meats, fish, OAA, oil/lard
Wild fish 3.6
OAA 1.9
Pond fish 0.6
Wildlife 0.8
Poultry 0.9
Pork 1.0
Beef 1.0
Oil/lard 2.0
Wild meats, fish, OAA as important as domestic meats but are wild foods are increasingly under threat.


Vegetables and fruits
Green leafy vegetables 4.7
Vegetables 3.9
Shoots, mushrooms 3.3
Oil/lard 2.0
Fruits 1.7
Low fruit consumption and limited bioavailability of fat soluble nutrients due to low fat intake.

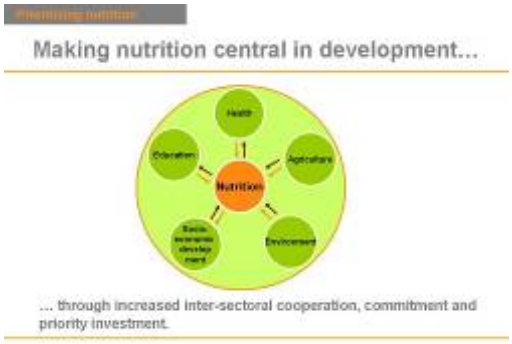

Trends in stunting of children <5yrs
47.3%
40.7 %
41.2 %
1993 FAO
2000 MICS II
2006 MICS III
28%
2020

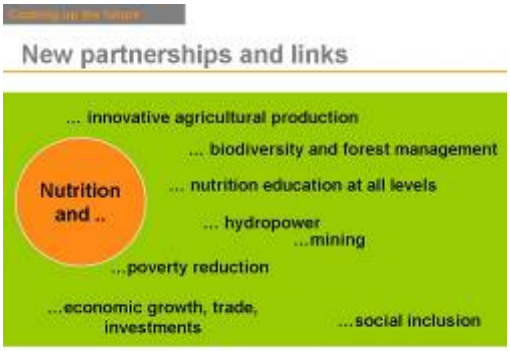

Trends in poverty and economic growth
46%
38%
33%
24%
1992/93
1997/8
2002/3
2015
Economic growth
6.5%
7.6%
leave LDC
2001
2006
2020


Consequences on the individual
Malnutrition
Risk factor for increased mortality, poor cognitive and physical development.
Malnourished children might do badly at school and most likely have low productivity in adulthood.
Their full potential for well-being and poverty reduction cannot be used.


Consequences on the whole nation
Malnutrition
Economic growth
Malnutrition effects the growth and development of the individual, but also constrains socio-economic development


Challenge 2020
Nutritional well-being
Economic growth + benefits
2020


Making nutrition central in development...
Nutrition
... through increased inter-sectoral cooperation, commitment and priority investment.


New partnerships and links
... innovative agricultural production
... biodiversity and forest management
Nutrition and ..
... nutrition education at all levels
... hydropower
...mining
...poverty reduction
...economic growth, trade, investments
...social inclusion


Conclusion
The cost of inaction is high, both economically and morally; the cost of action is modest by comparison.
Solutions are affordable, cost-effective and sustainable.
2020

National Nutrition Policy

Government Consensus Meeting

January 11, 2008

NNP and development sectors

- Main sectors:
  - Health
  - Agriculture
  - Education
  - Social and economic development
  - Environment
- Other sectors and their partners:
  - Massorganizations (LWU, LYU, NLFC, LFTU), Ministry of Information and Culture, Ministry of Industry and Commerce, and others

Chapter I.
1. Background

The NNP should encourage the Lao government to assure that socio-economic development will be translated into the parallel reduction of malnutrition and poverty of all ethnic groups in the Lao PDR.

Chapter I:
2.1. The nutrition and poverty link

- Despite socioeconomic development and poverty reduction there are still significant differences in poverty and malnutrition between:
  - uplands and lowlands
  - rural remote and urban areas
  - ethnic groups
  - women and men.
- Making malnutrition reduction a new cornerstone in poverty reduction requires long term priority investment by the government in alliance with the international organization and the private sector.

Chapter I:
2.2. Current nutritional status

- Children's nutritional status is a good reflection of a country's health status
- The important problem is chronic malnutrition
- Stunting is very high and remained largely unchanged over the last 10 years
- Especially vulnerable are children in remote upland areas and nonTai ethnic groups.

Chapter I:
2.2. Current nutritional status (continued)

- Chronic malnutrition (stunting): 41% (children under 5)
- Underweight: 38% (children under 5)
- Wasting: 7% (children under 5)
- Anemia: 37% (women reproductive ages)
  41% (children under 5)
- Vit A deficiency: 45% (children under 5)
- IDD: 27% (schoolagad children)
  13% (women of reproductive ages)
- Vitamin B1 deficiency (BeriBeri): vulnerability and attested incidences in case studies.

Chapter I:
2.2. Nutritional status

Consequences of malnutrition:

- Diminished learning ability
- Reduce work capacity
- Hamper continuous economic growth
- Increased risk for infection
- Greater risk to death.

Chapter I:
2.3. Constraints and challenges

- Priority investments in economic growth, limited in nutrition programming and surveillance
- Lack of institutionalization of nutrition within the GoL (lack of a Nutritional Institute, Nutrition Center) and low capacity (number of staff, untrained)
- Lack of active nutrition networking between development sectors : agriculture, education, environment/forestry, trade, industry - apart from health

Chapter I:
2.3. Constraints and challenges (continued)

- Narrow concept of food security with too strong focus on caloric intake, neglecting other nutritional guidelines
- Lack of programming in nutrition and in dietetics (e.g. hospitals) together with inadequate monitoring and evaluation (M+E)
- Low understanding of the diverse food cultures (knowledge, belief, and practices) of the various ethnic groups

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Chapter I:
2.3. Constraints and challenges (continued)

- Ethnic and linguistic diversity creates communication challenges for information and education campaigns
- No compensation for the destruction and loss of wild food resources in local diets and its negative impact on nutrition by national and international investors in the field of agro-business, hydropower, mining, etc.

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Chapter I:
2.3. Constraints and challenges (continued)

- Limited access to and availability of arable land and contamination with UXO
- Lack of understanding of the long-term impacts of other development policies (stabilization of shifting cultivation, land use planning and allocation, relocation and village consolidation, energy production) on food and nutrition security.

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Chapter I:
3. Rationale and need for a NNP

Three causal levels:

1. Individual level : Immediate causes
2. Community level: underlying causes
3. National level: Basic causes.

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Chapter I:
3. Rationale

- Root causes of malnutrition : poverty, inequity, lack of nutrition knowledge
- Need to tackle the problem at all three causal levels and of all sectors through efficient cooperation and coordination.

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Chapter I:
3. Need

- It is imperative that every level within the GoL, within the civil society and within their organizations actively taking up their respective roles and responsibilities
- Urgent action at household, community, and national levels is paramount
- Involving different Ministries, ministerial equivalent organization, various stakeholders of key sectors, and other social institutions are very crucial.

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Chapter I:
4. Legislation related to the National Nutrition Policy

- The NNP makes special reference to Article 8 in the Constitution
- The NNP will also follow the directions identified during the 8th Party Congress
- Lao governmental laws, policies, strategies, and regulations are detailed in the Appendix (4);
- International conventions (MDG 1, "The right to food", etc.) are listed in Appendix (5) and will be detailed in the NNS.

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Chapter II:
1. Goal

The overall goal of the National Nutrition Policy is to substantially reduce levels of malnutrition, especially of vulnerable groups, and to mainstream nutrition in national socio-economic growth and poverty reduction policies and strategies.

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Chapter II: 2. Objectives

The National Nutrition Policy formulates ten objectives. Appendix (3) gives an overview.

1. Sufficient, balanced and varied food intake;
2. Reduction of food and vector borne diseases;
3. Sufficient, stable and equal food access and food availability;
4. Improved mother and child care and education in nutrition and health;
5. Improved environmental health;
6. Improved and participatory nutrition programming and M+E;
7. Establishing intersectoral poverty-nutrition co-operation mechanism;
8. Priority investment in nutrition;
9. Institutionalizing nutrition in the GOL;
10. Facilitate nutrition related research and information systems.

Chapter II: 3. Programs

The ten objectives will be tackled in five programs:

1. Food and nutrition (including objectives 1 and 3)
2. Care and education (including objective 4)
3. Environmental health (including objectives 2 and 5)
4. Nutrition surveillance (including objectives 6)
5. Nutrition advocacy (including objectives 7,8,9, and 10).

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Chapter II: 4. Definition of terms

Definition of Nutrition:

Nutrition is defined as the science related to food and the relationship between food and nutritional well being determined by the way our bodies take in and use food through body metabolism and nutrient absorption. The definition also includes food composition, dietary guidelines (for different age groups, special physiological needs, and different physical activities), and the roles that various nutrients have in maintaining health.

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Chapter II: 4. Definition of terms (continued)

- Food is defined as any substance that people eat and drink to maintain life, growth, and identity. As a result, safe water is an essential part of food commodities, except medicine.
- Food security is achieved, when adequate food (quantity, quality, safety, socio-cultural acceptability) is available and accessible and satisfactorily used and utilized by all individuals at all times to live a healthy and active life.

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Chapter II: 5. Target by 2020

	Data		Target by 2020
Chronic Malnutrition (stunting)	41%	(2006)	28%
Wasting	7%	(2006)	2%
Underweight	38%	(2006)	15%
Anamia in WRA	37%	(2006)	15%
Anamia in CU5	41%	(2006)	20%
Vitamin A deficiency	45%	(2000)	20%
IDD in school children	27%	(2000)	10%
IDD in WRA	13%	(2006)	5%
Infant mortality	70/1000	(2005)	20/1000
Under 5 mortality	98/1000	(2005)	35/1000

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Chapter II: 6. Scope

This National Nutrition Policy is targeting all people of the Lao PDR, with special focus on the following vulnerable groups:

1. Ethnic groups living in rural and/or remote upland areas with high levels of stunting
2. Women of reproductive age (focus on pregnancy, puerperium, and lactation) and children (focus early childhood before 2 years, children under five years, school age children).

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Chapter II: 6. Scope (continued)

3. People who have recently been resettled, who have moved from the uplands to the lowlands, and/or whose wild food resources have been destroyed
4. People with changing and unstable livelihoods, limited access to land and food, low support facilities, and who are at high risk to natural shocks
5. Urban poor and youth with low educational status.

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Chapter III: 1. Strategic principles

The policy will apply the following strategic principles:

1. Prioritized targeting
2. Decentralization
3. Integration and effective cooperation
4. Institutionalizing nutrition within GoL
5. Capacity building
6. Awareness and cultural sensitiveness
7. Empowerment of gender
8. Sustainability and resilience
9. Prevention and treatment
10. Accountability
11. Surveillance
12. Cultural identity

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Chapter III: 2. Rights and responsibilities

The Ministry of Public Health will be assigned as the lead agency for overall coordination and effective implementation of the National Nutrition Policy.

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Chapter III: 3. Institutional partnerships within the GoL and the private sector (continued)

Key partnerships include:

- Health
- Agriculture
- Education
- Planning and investment
- Mass organization (women, youth and trade)
- Lao Front for National Construction
- National Commission of Mother and Child
- Justice
- Industry and Trade
- Information and Culture
- Water resource and environment
- Land Management Authority
- Energy and Mining and others...

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Chapter III: 3. Institutional partnerships within the GoL and the private sector (continued)

- With the approval of the National Nutrition Policy a National Nutrition Committee (NNC) will be established under the leadership of the National Commission on Mother and Child (NCMC). The National Nutrition Committee will comprise of various GoL key partners.
- A nutritional network at central, provincial and district level will also be established.

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Chapter III: 3. Institutional partnerships within the GoL and the private sector (continued)

- The NNC will provide independent and technical strategic advice to the MoH and other line ministries and monitor the linkages between the National Nutrition Policy and other GoL policies and to effectively mitigate adverse impacts which would obstruct the equal improvement of nutritional well-being.
- The NCMC in turn will supervise the nutritional achievements,
- while the NNC will facilitate the management and the international coordination.

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Chapter IV: Implementation

After the endorsement of the National Nutritional Policy immediate action should be taken:

1. The Ministry of Public Health in coordination with relevant key sectors shall disseminate the NNP and shall cooperate with relevant key sectors to continue to draft the National Nutrition Strategy and Action Plan (specific details for each relevant sector).
2. Various ministries, ministry equivalent organizations, Provinces, vulnerable regions, Capitals, shall successfully implement the National Policy through effective coordination.

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Thank you for your kind attention

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