REPORT OF THE
SECOND VIETNAM TUNA FISHERY
ANNUAL CATCH ESTIMATES WORKSHOP (VTFACE-2)

1-5 April 2013

Nh Tranh, Khanh Hoa, Viet Nam

Western and Central Pacific Fisheries Commission
Pohnpei, Federated States of Micronesia
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CONTENTS

1. OPENING

1.1 Introduction

For a number of years, the evolving tuna fisheries in Vietnam have been of interest to the Western and Central Pacific Fisheries Commission (WCPFC) given that the Vietnam tuna fisheries exploit the same tuna stocks as the other member countries of the WCPFC. The importance of the Vietnam tuna fisheries to the WCPFC and the involvement of Vietnam in the WCPFC process has been acknowledged with their inclusion in the a new project offered by the Global Environment Facility (GEF) - ***West Pacific East Asia Oceanic Fisheries Management (WPEA OFM)*** project, which began in 2010 (see http://www.wcpfc.int/doc/2009/wpea-ofm-project-document). The activities to be carried out under this project contribute towards the following objective:

"*To strengthen national capacities and international cooperation on priority transboundary concerns relating to the conservation and management of highly migratory fish stocks in the west Pacific Ocean and east Asia (Indonesia, Philippines and Vietnam)*"

The WPEA OFM project covers, *inter alia*, the following key objectives

(i) strengthen national capacities in fishery monitoring and assessment,
(ii) improve knowledge of oceanic fish stocks and reduce uncertainties in stock assessments,
(iii) strengthen national capacities in oceanic fishery management, with participant countries contributing to the management of shared migratory fish stocks,
(iv) strengthen national laws, policies and institutions, to implement applicable global and regional instruments.

Four workshops (VTFDCs) have been conducted over the past three years to firstly, establish a plan for the implementation of data collection systems in the Vietnam tuna fisheries, then review progress in the data collection systems established for the domestic longline, purse seine and gillnet fisheries (the workshop reports can be found at http://www.wcpfc.int/west-pacific-east-asia-oceanic-fisheries-management-project).

The first Vietnam Tuna Fisheries Annual catch estimates workshop (VTFACE-1), held in Da Nang in April 2012, produced annual catch estimates for Vietnam tuna fisheries by GEAR and SPECIES for years 2000-2011, thus resolving a major data gap and satisfying a fundamental reporting obligation for members, cooperating non-members and participating countries and territories (CCMs) of the WCPFC.

This report contains a summary of presentations and discussions held during in VTFACE-2 workshop plenary, which was conducted over five days (1-5 April 2013), and includes specific recommendations as key outputs from the workshop. The workshop required considerable translation from Vietnamese into English and vice-versa and special thanks was afforded to the main interpreters, Mr Viet Anh and Mr. Nguyễn Bá Thông from the DECAFIREP and FICEN offices respectively.

Mr, Phạm Trọng Yên, Deputy Director of Directorate of Fisheries (D-FISH), provided an opening address highlighting the recent developments in Vietnam with respect to tuna fisheries. He hoped that Vietnam can continue progressing towards becoming an official member of the WCPFC and that the work undertaken in recent years through the WPEA data collection initiatives and the workshops would be seen in a positive light by other WCPFC members. Vietnam are also looking forward to the next WPEA project which should extend the successful work undertaken in the first project.

Dr SungKwon Soh provided an opening presentation on behalf of the WCPFC (see VTFACE-2 Document #1), describing the history with the establishment of the WCPFC, background on the purpose of the WCPFC, the member countries and the structure of the Secretariat, the reporting obligations of members and cooperating non-members, recent annual catch estimates, the status of the main tuna stocks in the WCPFC Area and an overview of the history of the WPEA project.

1.2 Appointment of Chair and Rapporteurs

Dr Antony Lewis was appointed as Chair of the workshop, and Mr Peter Williams and Mr Viet Anh were appointed rapporteurs.

1.3 Adoption of the Agenda

The agenda proposed for the workshop was adopted as presented in APPENDIX 1. The list of the participants can be found in APPENDIX 2 and a list of the presentations and data summaries made during the workshop can be found in APPENDIX 3.

The Chair noted that an initial pre-VTFACE workshop was originally planned to cover (i) a review of the Handline fishery, (ii) estimates from the non-WPEA Provinces and (iii) the review of catch estimation methodologies, all of which would feed into the main VTFACE (Annual Catch Estimates) Workshop. He noted that for the sake of efficiency, all of the pre-workshop objectives above were combined ad conducted within the VTFACE workshop and have been documented in this report.

2. Background on need for Annual Catch Estimates

Mr Williams provided an introductory presentation on the WCPFC requirements for the provision of Annual catch estimates and expected outputs from the workshop (see VTFACE-2 Document #2) , covering the following areas:

- The WCPFC member country data-reporting obligations (refer to http://www.wcpfc.int/doc/data-01/scientific-data-be-provided-commission-revised-wcpfc4-wcpfc6)
- How annual catch estimates provide a fundamental description of a fishery
- The current WCPFC Annual catch estimates by GEAR and SPECIES
- A process for producing outcomes
- The expected outcomes of the Workshop

The main outcome of the workshop was to produce 2012 catch estimates for Vietnam's tuna fisheries, by GEAR and SPECIES. Potential issues to be addressed during the process of catch estimation at this workshop included (i) whether reliable estimates for non-WPEA provinces could be produced, (ii) the problems with separating the Handline data from the Longline data and (iii) whether the historical estimates (i.e. pre-2000) could be produced.

3. Recent developments in the Vietnam Handline fishery

3.1 Report on Vietnam handline fishery

Mr Pham Viet Anh provided a presentation on the recent developments with the establishment of the handline fishery, referring to VTFACE-2 Document #3. The following are the key points of his presentation and ensuing discussion (noting that there is more detail provided in the Document #3):

- In regards to Gear Configuration, the handline gear consists of four poles per vessel for handline fishery. A total of eight hooks are used per night (i.e. two hooks per line). Weights of 3-4 kgs are used to weight the line. One fishing trip typically takes about 1 t. (more information in Document #3).
- Handline vessels usually start fishing around 17:00-18:00 and use squid baits (hooked in the tail). There have been reports that the baits are changed every 30 minutes.
- Catch rates in the handline fishery are clearly higher than in the longline fishery but with generally a lower bycatch species composition.

- Fish quality has been identified as a significant problem in the fishery and one explanation was the build-up of lactic acid. The haul-in process causes build-up of lactic acid in the fish and a solution used elsewhere is to submerse fish in a slurry of ice to reduce the core temperature as soon as possible after landing. It was noted that one of the commercial companies in Binh Dinh is looking at this to improve the quality of the product. Also, fishers are not accustomed to using ice to preserve the catch and it was acknowledged that this is probably contributing to the problem
- The economic benefits of HL (compared to LL) are obvious but issues with quality and market need to be addressed.

Mr Williams provided a presentation on a preliminary characterization of the handline fishery in the available data (see VTFACE-2 Document #4). Unfortunately, he noted that it is not yet possible to separate out the longline and handline catch/effort data completely, but there are key differences that are evident in the data for these two fisheries, including (i) there is a clear trend related to the lunar month in the handline fishery which is not evident in the longline fishery (that is, there is no handline activity in the period around the full moon). There is also less bycatch (e.g. billfish, sharks) in the handline fishery compared to the longline fishery, and the yellowfin CPUE (kgs/day) in the handline fishery is about double that in the longline fishery.

3.2 Recent developments of handline fisheries in Vietnam Provinces

Each Sub-DECAFIREP representative was asked to present information on recent developments in the handline fishery in their province. The detailed information, statistics/data summaries presented are contained in the fishery reports from each province (see VTFACE-2 Documents #6 - #14). The following are the key points from the series of presentations made for each province:

- Suggestions were made with regards to distinguishing handline from longline vessels, including, the start set time, the number of hooks used and trip duration (HL trips are shorter); squid will be an obvious bycatch from handline activities.
- The use of more than one gear within a trip (i.e. longline and handline) is common, so revisions to the data collection system should take this into account;
- The provision of logsheets was biased towards the longline fishery, that is, the proportion of the total vessels using longline was higher that the proportion of handline vessels providing logbooks;
- The fishers acknowledge the benefits of the handline fisheries, particularly with respect to revenue benefits and that the fishery is less labour-intensive. However, there were some concerns on the sustainability of the fishery and if there were problems, whether they would revert to longlining, for example. There were also comments on the potential impacts of the fishery eg the use of lights to concentrate the tuna, and impacts on the ecosystem and whether there were potential problems with the handline fishery exploiting the spawning biomass.
- Phu Yen fishers reported some concern on continuing with the handline gear and a switch back to the longline gear which was related to issues of quality and getting poorer returns from their catch. This was not the situation in Binh Dinh as they had resolved some of the issues with quality (with assistance through a specific study) and were able to demand a higher price.
- There were reports of minor handline activity in the non-WPEA provinces, but it was clear that interest was growing. At this stage, quantitative information is mostly not available.
- Handline vessels from other provinces are attracted to where they can better market their fish and Binh Dinh appears to attract vessels from other provinces. The workshop noted that it was important to understand the source of the data used for provincial estimates, whether the data are available based on where the vessel landed or where the vessel is registered.

Mr Vang, Nha Trang University, provided a presentation on studies related to the handline fishery in the past year (see VTFACE-2 Documents #17). The study was undertaken to try and identify the main reasons for poor quality fish from the handline fishery and involved taking samples from fish immediately after landing on-board and comparing these with samples taken during offloading in port. Three main tests were conducted and compared to the control, (i) better processing/bleeding, (ii) less stress applied to the fish during the

hauling (i.e. let the fish 'run free' as per a longline-caught fish) and (iii) a change in the light intensity (i.e. when fish hooked, turn off the lights). Measures of ammonia, fatty acids, histamine and lactic acid were examined to try and determine which were the most important factor(s).

In the ensuing discussion, it was noted that the effect of storage and immediate processing with ice slurry (for example) resulted in the greatest benefits; the trial in Binh Dinh had proved successful in this respect. It was also noted that about 40% of the hooked fish escaped before landing and that this is another area to improve in the fishery.

In summing up this agenda item, the Chair identified five main issues that need to be dealt with and that these should be addressed with suitable recommendations from the workshop.

1. The WPEA data collection forms should be updated to obtain representative data from the handline fishery;
2. How to separate the existing data for the longline and handline fisheries;
3. A study of ALL potential impacts of the handline fishery on tuna stocks should be conducted to inform future management decisions on this fishery;
4. Further investigation should be undertaken to resolve the problems with fish QUALITY and MARKETING in the handline fishery and ensure all provinces are informed;
5. The preliminary report on the handline Fishery (produced by DECAFIREP) should be enhanced to incorporate the relevant information from the provincial reports and summaries from the database system.

4. Tuna fishery exports and imports

Ms. Le Hang (VASEP) provided a comprehensive presentation on exports and imports related to tuna products from Vietnam (see VTFACE-1 Documents #15– Appendix 3). Vietnam's tuna export volume and value continues to increase. Tuna is now one of the top two of the seafood items exported. The estimated total tuna exports for 2012 was 159,000 t covering canned/cooked loins (Category "HS16") and fresh/whole tuna ("HS03"). The estimated volume of imported tuna for 2012 was 103,000 t. The main imported tuna are destined for canneries. The most important markets for exported tuna are the EU, USA and Japan, but there have been some significant increases in tuna exported to other countries in recent years.

There were some negative developments over the past year with respect to import data compilation, with responsibility for compiling imports moved to the MARD - Department of Veterinary who have yet to establish the same data compilation procedures as before and a breakdown by species is not yet covered, for example.

The monthly trends in category "HS03" (fresh frozen/whole and processed tuna) reflects changes in demand, the quality of the fish (which may be stockpiled) and the global price, all of which are, of course, inter-related. It was suggested that the estimated landed value of the catch in Vietnam was about USD 150 million.

The recommendation calling for enhancements in export/import data for tuna products was carried over from VTFACE-1, including the need to invite the main agencies involved in compiling these data to the next VTFACE meeting.

5. Tuna Catch Estimates in the non-WPEA provinces

Participants from six non-WPEA project provinces were invited to present a summary of their respective oceanic tuna fisheries which covered: Ba RiaVung Tau, Da Nang municipality, Quang Nam, Ninh Thuan, Binh Thuan, and Quang Ngai. The detailed information, statistics/data summaries presented are contained in the fishery reports from each province (see VTFACE-2 Documents #6 - #14). The purpose of this agenda item was to review, discuss and then agree on oceanic tuna catch estimates for 2012 by GEAR and SPECIES for each of these provinces. The information compiled under this agenda item was discussed further in the

decisions on compiling the provincial and national-level annual catch estimates (see Section 8). The following are some key points identified in the discussion of each province.(will add a bit to some of these) :

- Longline/handline landings in the non-WPEA provinces are not as significant in the central provinces, although there is growing interest in this type of fishing method.
- Da Nang has only one landing site so the logistics for monitoring/data collection is easier than for most other provinces. The main gears types are purse seine and gillnet. Some tuna catch are trucked to Da Nang processing plants from other provinces.
- Quang Nam has a logistical problem with landing site and supports 80 purse seine and 56 gillnet registered vessels.
- Ninh Thuan supports 48 gillnet vessels the largest fishing in the vicinity of the Spratley Islands and taking around 4,000 t per year, of which approximately 80% is skipjack tuna.
- Binh Thuan supports a large purse seine fleet (269 vessels targeting tuna) which take about 3,000 t. of oceanic tuna species per year.
- Quang Ngai supports 200 gillnet vessels, 120 purse seine vessels (with some handline fishing) with those vessels targeting oceanic tuna species fishing in the vicinity of the Spratley and Paracel Islands depending on season. The total oceanic tuna catch for gillnet and purse seine gears is estimated to be about 4,000 t / year for both fisheries.
- Ba Rai/Vung Tau support around 929 small-scale hook-and-line vessels with small oceanic tuna catches, 179 gillnet vessels taking about 2,400 t. per years and 211 purse seine vessels taking about 6,500 t. of oceanic tuna species catch per year.
- Data on the species composition of the oceanic tuna catch was mostly absent but each provincial representative was able to provide their best estimate based on consideration of what proportion of their fleets (by gear) targeted oceanic tuna and what was their understanding of the proportion of oceanic tuna in the total catch of all species. It was interesting to note that the proportion of oceanic tuna species composition by gear amongst these provinces was often different and reflects the overlap of fishing areas for coastal (neritic) and oceanic species.
- There was also some discussion on the estimates provided, which are 'production' estimates and are determined from the registered vessels for each province which doesn't take into account where the catch was landed. If a significant number of vessels from a province land their catch in a WPEA province then there will be potential double-counting, since the WPEA method monitors landings from all vessels, regardless of where they are registered. The extent of vessels moving from province to province is an issue that requires further investigation in the future.

A decision was made to implement the WPEA data collection on a trial basis in the coming year in these provinces. An outline of the implementation plan is provided in APPENDIX 7.

6. Tuna catch estimation methodologies

Mr Viet Anh provided a presentation on the draft Report on comparison of methodologies for estimating tuna catch, referring to the workshop to VTFACE-2 Document #4. The FAO method has been used in all fisheries in Vietnam for more than a decade and is therefore well known amongst the sub-DECAFRIREP offices. The WCPFC have implemented the WPEA data collection system in the three central provinces as a means to ensure the data collected in these fisheries adheres to the WCFPC data reporting requirements. The WPEA method is labor-intensive but provides more accurate estimates and is consistent with data collection systems used in nearly all other WCPFC member countries. The FAO method is used to estimate annual catches and is not as labor-intensive (as the WPEA method is) so no new resources are required, but it doesn't satisfy all of the WCPFC data requirements (e.g. the need to have catch/effort data at certain spatial/temporal stratification which is essentially sourced from logbook data). The FAO method can also produce biased estimates if the key input data are not representative or well-estimated. For example, broad estimates of the BAC and an assumption that all registered vessels are always active can produce estimates of catch well in

excess (i.e. double or more) the actual value of catch taken. The FAO method also does not cater for determining the catch by species (i.e. no oceanic tuna species composition data are collected).

The ensuing discussion suggested that the FAO methodology could be improved by extending it to collect oceanic tuna species composition data. It was also suggested that the WPEA data collection be extended to the six other provinces, pending available funding (although the new WPEA project will be able to support this work), to ensure accurate estimates of tuna catch are obtained. Review of the estimates from the two methods would then be undertaken at the next VTFACE workshop (April 2014). The current WPEA provinces expressed some concern on the level of work required to collect WPEA data and a suggestion was made for WCPFC/SPC to undertake a sensitivity analysis of the WPEA data collected over the past three years to determine a minimum level of coverage to collect representative WPEA data which would then hopefully relieve some of the current burden. Presentations of tables/graphs/maps of the WPEA data already collected and processed were well received and show how valuable the information collected will be in the future and the extent of potential analyses that can now be conducted. Suitable recommendations covering these issues were formulated and are available in APPENDIX 4.

7. Tuna catch estimates in the WPEA Provinces

The workshop proceeded to review the annual catch estimates for 2012 in the provinces that have established WPEA data collection with a presentation from each provincial representative. The following briefly summarises some key information in each presentation and ensuing discussion (see Appendix 3 which refers to presentations and working papers with more detailed information). The information compiled in these agenda items was discussed further in the decisions on compiling the national-level annual catch estimates (see Section 8).

- There was a big increase in the number of vessels using the handline gear in Binh Dinh, most switching from longline, but also gillnet and squid vessels switching to handline. The additional work required to monitor these vessels caught the Binh Dinh Sub-DECAFIREP office by surprise but they were still able to collect very useful data with good, representative coverage. They now have an efficient WPEA data collection system in place after seeking cooperation from the key stakeholders, a lesson for other provinces embarking on the WPEA data collection. They remain reluctant to use the WPEA method since it is labour-intensive but has proven to provide much more reliable estimates than the FAO method. The WPEA data from Binh Dinh was used as an example for how much more reliable and in-depth information from the fishery can be obtained. However, the burden on the Sub-DECAFIREP offices was acknowledged, and WCPFC/SPC will conduct a sensitivity analysis to determine a minimum sampling coverage to see whether the sampling effort can be reduced.
- Logbook coverage in Phu Yen for 2012 was estimated to be 77%, which is exceptional, although these data are yet to be processed. The Sub-DECAFIREP office reported that there continue to be problems in logsheet data-reporting quality. There is now good cooperation with the middle-man/buyers in collecting landings data. Phu Yen has not had the same success in the handline fishery as Binh Dinh with some vessels switching back to longline by the end of 2012 due to not resolving the fish quality and market issues explained earlier. There have been some problems getting the complete COASTGUARD data.
- A similar situation with the switch to handline fishing occurred in Khanh Hoa during 2012. Khanh Hoa supports the largest gillnet fleet and this is where most of the gillnet catch is landed. There have been some problems getting the complete COASTGUARD data but cooperation with all stakeholders is now very good.

8. National Tuna Fishery Catch Estimates

After further discussion, a proposal for how to proceed was suggested and some out-of-hours work was done compiling the available estimates from each Province into EXCEL worksheets (one for each gear) for subsequent review and discussion in plenary (see APPENDIX 8).

The workshop worked through each gear and provincial estimate by species to discuss and then agree on each estimate. The estimates produced from the provinces with WPEA data collection were considered more reliable and discussion on these estimate revolved around issues of whether the Coastguard data (used to raise the WPEA data) was representative for that Province/gear, and if not, what could be used as a more suitable means of raising the data. The estimates from the non-WPEA provinces required more substantial discussion and are considered to be less reliable, but the best available at this stage. The notes accompanying the tables in APPENDIX 8 provide some background on the basis for each estimate. The sum of the WPEA and non-WPEA provincial catch estimates by gear produce the national tuna fishery catch estimates which were transcribed into the historical annual tuna catch estimates provided in APPENDIX 9.

9. Other matters

9.1 Progress on recommendations from VTFACE-1

The workshop considered the progress on addressing the recommendations from VTFACE-1 and the review outcomes is available in APPENDIX 6.

9.2 Study on Vietnam Tuna Fisheries Management

Mr Nguyễn Bá Thông provided a presentation of preliminary work on a study conducted on Vietnam Tuna Fisheries Management (see VTFACE-2 Document #16). During the ensuing discussion, it was noted the monthly collection of the BAC was very important for reliability of estimates produced using the FAO methodology. The tuna fishery profiles for the central provinces were acknowledged to be very useful and a recommendation was made to consider producing the tuna fishery profiles for the new six provinces. It was acknowledged that these profiles needed to be continually updated to ensure their usefulness and dissemination on relevant web sites was recommended, as well as routine translation.

9.3 Tuna data management

The workshop considered how best to ensure the data collected under the WPEA project would be managed as a permanent activity in the future. The FICEN is best placed to take on the role of overseeing the data processing/management in the longer term, but this is a policy issue that needs further discussion an the national government level (e.g. DECAFIREP and FICEN). It was suggested that the Sub-DECAFIREP offices are best-placed to enter the data with the benefit of then having a database reporting system to facilitate the production of estimates and data summaries. SPC can provide DECAFIREP/FICEN with the TUFMAN database system and then a local database developer could easily modify the data entry forms to replace the English text with Vietnamese. A recommendation was formulated in an attempt to address this issue in the coming year.

9.4 Changes to WPEA data collection forms

The workshop considered the changes to WPEA data collection forms to better collect data from the new handline fishery. The changes to the forms covered the following:

- A new combined Longline/Handline logsheet, which was similar to the longline logsheet, but with a new column added for gear used at the daily level (since both handline and longline gears can be used intermittently during one trip).
- A change to the WPEA Longline landings form to include a field for gear type

- The WPEA port sampling form did not require any changes since there was already a field for gear type.

The new forms were translated into Vietnamese and accepted by the workshop for immediate implementation.

9.5 Progress on WPEA Phase 2 Project

The chair reported on progress with the next WPEA project. Surplus in the previous WPEA project and some co-funding will ensure data collection activities can continue throughout 2013. A very favourable review of the previous WPEA project has facilitated the progress towards the next project, which will have a budget approximately twice that of the first WPEA project but conducted over four years (i.e. a longer period). There will be additional activities in the new project, including consideration of - climate change issues, certification/market supply chain, by-catch species (ecosystem management), an extension of data collection beyond the provinces covered in the first project. It is hoped the new WPEA project will be up and running in the first half of 2014.

10. Recommendations from the workshop

Based on discussions during the workshop, nine (9) recommendations were developed and agreed by participants to guide the work required in the coming year (see APPENDIX 4).

In drafting the recommendations for improving annual catch estimates in the future, the workshop recognized that the project needs to continue to take steps during the course of the project to ensure its sustainability, to build capacity at all levels of planned activity, to disseminate information and outcomes from the project and maximize collaboration and cooperation with all relevant Government and industry agencies. A specific VTFACE-2 recommendation had been formulated with respect to starting work on future plans for integration of the data collection system established by the WPEA into the national data collection system.

11. CLOSE

Dr Lewis thanked the organizers of the workshop, the staff of DECAFIREP and the staff of the Khanh Hoa Sub-DECAFIREP office for hosting the workshop. He also thanked the participants from all SUB-DECAFIREP provincial offices that attended and VASEP for their input into the meeting. He noted that significant progress had again been made during this workshop with the addition of estimates for six provinces not previously covered under the WCPFC/WPEA project, as well as a useful review of the handline fishery, which will be further elaborated, and consideration of relevant catch estimate methodologies to be applied in the future workshops.

Appreciation was extended to the WCPFC and the funding agency for the WPEA OFM project – GEF, and the Chair was thanked for his expert leadership of the workshop process. The meeting was closed with a round of applause.

The next WPEA workshop will be the fifth Vietnam Tuna Data Review Workshop (VTFDC-5) to be held in November 2013. However, it was noted that, as sampling programmes for all gears are now fully implemented, future Tuna Data Review and Annual catch estimates workshops should be conducted back-to-back, in the same week, ideally in March/April each year in the lead-up to the deadline for the submission of data to the WCPFC (30th April each year). As such, VTFDC-5 and VTFACE-3 could tentatively be scheduled for one week during April 2014.

APPENDIX 1. VTFACE-2 Agenda

West Pacific East Asia Oceanic Fisheries Management
Second Vietnam Tuna Fisheries Annual Catch Estimates Workshop (VTFACE-2)
1 – 5 April, 2013
Nha Trang, Khanh Hoa, Vietnam

AGENDA

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1. **OPENING** 1.1. Registration 1.2. Introduction of participants 1.3. Election of Chairman and Rapporteurs 1.4. Adoption of the Agenda 1.5. Opening addresses and objectives of the workshop	 D-FISH DECAFIREP WCPFC/SPC
2. IMPORTANCE OF ANNUAL CATCH ESTIMATES AND EXPECTED OUTPUTS FROM THE WORKSHOP	WCPFC/SPC
3. OVERVIEW OF THE DEVELOPMENT OF HANDLINE FISHERIES	DECAFIREP Sub-DECAFIREP offices
4. HISTORICAL TUNA FISHERY CATCH – SIX PROVINCES	Sub-DECAFIREP offices Da Nang, Quang Ngai, Quang Nam,Binh Thuan, Ninh Thuan, Ba Ria – Vung Tau
5. TUNA FISHERY EXPORTS AND IMPORTS	VASEP
6. CATCH ESTIMATION METHODOLOGIES	DECAFIREP WCPFC/SPC
7. **WPEA TUNA DATA COLLECTED IN 2012** 7.1. Overview of data collected by Binh Dinh for 2012 7.2. Overview of data collected by Phu Yen for 2012 7.3. Overview of data collected by Khanh Hoa for 2012	Sub-DECAFIREP Binh Dinh Phu Yen Khanh Hoa
8. **COMPILATION AND REVIEW OF HISTORICAL TUNA FISHERY CATCH ESTIMATES**	CHAIR
9. **OTHER MATTERS**	CHAIR
10. **RECOMMENDATIONS AND CLOSE OF WORKSHOP**	CHAIR

APPENDIX 2. List of Participants

West Pacific East Asia Oceanic Fisheries Management
Second Vietnam Tuna Fisheries Annual Catch Estimates Workshop (VTFACE-2)
1 – 5 April, 2013
Nha Trang, Khanh Hoa, Vietnam

LIST OF PARTICIPANTS

No	Name	Organisation
1	Chu Tiến Vĩnh	Former Deputy Director General of D-FISH
2	Phạm Trọng Yên	Science and Technology and Int. Department
3	Nguyễn Văn Do	DECAFIREP
4	Phạm Thị Thùy Vân	D-FISH
5	Phạm Việt Anh	DECAFIREP
6	Phạm Hưng	DECAFIREP
7	Lê Hằng	Vasep
8	Nguyễn Bá Thông	FICen
9	Đặng Văn Thi	RIMF
10	Vũ Văn Tám	DECAFIREP-VMS centrer
11	Hoang Quang Minh	Sub-DECAFIREP Đà Nẵng
12	Võ Tấn Thành	Sub-DECAFIREP Quảng Nam
13	Nguyễn Minh Tú	Sub-DECAFIREP Quảng Ngãi
14	Đặng Văn Tín	Sub-DECAFIREP Ninh Thuận
15	Nguyễn Minh Quang	Sub-DECAFIREP Bình Thuận
16	Nguyễn Bi	Sub-DECAFIREP Bà Rịa Vũng Tàu
17	Lữ Thanh Phong	Sub-DECAFIREP Khánh Hòa
18	Nguyễn Bá Duy	Sub-DECAFIREP Khánh Hòa
19	Võ Quốc Dũng	Sub-DECAFIREP Khánh Hòa
20	Võ Khắc Én	Sub-DECAFIREP Khánh Hòa
21	Nguyễn Hữu Cầu	Sub-DECAFIREP Bình Định
22	Nguyễn Hải Bình	Sub-DECAFIREP Bình Định
23	Lê Đức Tuồng	Sub-DECAFIREP Phú Yên
24	Nguyễn Y Vang	Nha Trang University
25	Sung Kwon Soh	WCPFC/SPC
26	Antony Lewis	WCPFC/SPC
27	Peter Williams	WCPFC/SPC

APPENDIX 3. List of VTFACE-2 Presentations, documents and data summaries

#	Presentation / Document / Data summary	Source
1	An overview of the WCPFC and data reporting obligations	WCPFC
2	WCPFC Annual Catch estimates requirements and expected outcomes from VTFACE-2	WCPFC/SPC
3	Overview of the Vietnam Handline fishery	DECAFIREP
4	Data summaries from the Vietnam Handline and Longline fisheries	WCPFC/SPC
5	Catch estimation methodologies	DECAFIREP
6	Annual tuna fishery report -- Binh Dinh Province	Sub-DECAFIREP – Binh Dinh
7	Annual tuna fishery report -- Phu Yen Province	Sub-DECAFIREP – Phu Yen
8	Annual tuna fishery report -- Khanh Hoa Province	Sub-DECAFIREP – Khanh Hoa
9	Annual tuna fishery report – Da Nang	Sub-DECAFIREP - Da Nang
10	Annual tuna fishery report – Quang Ngai	Sub-DECAFIREP - Quang Ngai
11	Annual tuna fishery report – Quang Nam	Sub-DECAFIREP - Quang Nam
12	Annual tuna fishery report – Binh Thuan	Sub-DECAFIREP - Binh Thuan
13	Annual tuna fishery report – Ninh Thuan	Sub-DECAFIREP - Ninh Thuan
14	Annual tuna fishery report – Ba Ria – Vung Tau	Sub-DECAFIREP - Ba Ria – Vung Tau
15	VASEP Export and Import data summary 2007-2012 (Vietnamese)	VASEP
16	Vietnam Tuna fisheries management study	FICEN

APPENDIX 4. Recommendations from VTFACE-2

SECOND VIETNAM ANNUAL TUNA CATCH ESTIMATES WORKSHOP

(VTFACE-2)

Nha Trang, Khanh Hoa, Vietnam

1–5 April 2013

RECOMMENDATIONS

DECAFIREP will arrange for a translation of the final version of the Recommendations into Vietnamese and then dissemination to Sub-DECAFIREP offices and other important stakeholders of the WPEA project in Vietnam. Responsibility for undertaking the work involved in each recommendation has been highlighted (bold/underlined).

1. Handline fishery

The Workshop noted the development of the Handline fishery in Vietnam over the past two years and the significant catch taken by this gear. However, there are several important areas in the management of this fishery that need urgent attention:

a. **WCPFC and DECAFIREP** need to update the WPEA data collection forms to obtain representative data from the handline fishery and avoid the grouping of the handline fishery data with the longline fishery;
b. **WCPFC and DECAFIREP** need to separate out the handline fishery data from the longline fishery data in the Vietnam TUFMAN database system;
c. **WCPFC and DECAFIREP** need to determine how to separate out the Handline trips in the Coastguard data from the combined Longline/Handline trips;
d. **WCPFC and DECAFIREP** need to produce a proposal for a study of ALL potential impacts of the Handline fishery on tuna stocks which will then inform future management decisions of this fishery. The latest findings of the study will be reported to VTFACE-3 (April 2014);
e. **DECAFIREP, Sub-DECAFIREP and Nha Trang University** should continue to collaborate with respect to investigating and resolving the problems with **QUALITY and MARKETING** in the handline fishery and report the latest findings to VTFDC-5 (November 2013) and VTFACE-3 (April 2014);
f. **DECAFIREP**, with assistance from **Sub-DECAFIREP and WCPFC**, will enhance and complete the Report on the Handline Fishery, incorporating the relevant information from the Provincial reports produced for VTFACE-2 Workshop.

2. Revisions to Vietnam Tuna Fishery Data Collection system

The Workshop was provided with a preliminary review comparing the WPEA and FAO data collection and estimation methodologies. The following work was recommended in the coming year:

a. **DECAFIREP and Sub-DECAFIREP** offices will work together to improve the FAO method by collecting oceanic tuna and billfish species composition data. A formal letter from **DECAFIREP** will assist the **Sub-DECAFIREP** offices to collect these data.
b. The six **Sub-DECAFIREP** offices will implement WPEA data collection on a trial basis in the coming year according to the requirements specified in (**APPENDIX 8**). The FAO method will also be used to estimate catches (with the new requirement for species composition data collection) and estimates from both methods will be presented at VTFACE-3 (April 2014).

c. **WCPFC** will conduct a sensitivity analysis with the data collected under the WPEA project (2010-2012) to determine the minimum level of sampling coverage required to obtain reliable estimates of catch and species composition.
d. **DECAFIREP** formally contact the **MARD Port Authorities** to request they collaborate with fishing companies, buyers, processing plants to collect information on behalf of the respective Sub-DECAFIREP offices.

3. Oceanic tuna catch in other provinces

The Workshop noted that there have been reports of oceanic tuna species catches landed in provinces other than the NINE provinces represented at VTFACE-2, and therefore recommended that **DECAFIREP and WCPFC** investigate the extent of oceanic tuna catches landed in ***Ho Chi Minh City, Ben Tre, Hue, Quang Tri, Quang Binh***.

4. Tuna Exports and Imports

The workshop again noted the potential value in the export and import data but also noted some negative developments over the past year. The Workshop recommended that **DECAFIREP**, **VASEP** and **other relevant agencies** undertake the following over the coming year:

- **DECAFIREP** formally invite **MARD - Department of Veterinary** and **Ministry of Finance (Customs)** to the next VTFACE meeting. The invitation should also indicate what data summaries each of these agencies should prepare and present at VTFACE-3.
- **VASEP** attempt to compile exported tuna catch volume by "HS" category; conversion factors (to whole weight) could then be applied, in the case of HS 16 commodities

5. Annual Provincial tuna fishery reports for VTFACE workshops

The workshop recommended that the NINE provincial **Sub-DECAFIREP** offices now attending the VTFACE workshops continue to prepare an annual provincial tuna fishery report using the template developed by DECAFIREP in consultation with Sub-DECAFIREP offices and WCFPC (see APPENDIX x). **DECAFIREP** will endeavour to request the other provinces (with oceanic tuna catch landings) to also provide annual tuna fishery reports at the next VTFACE workshop.

It is noted that some provinces have yet to implement the WPEA Data collection system but that the revised template now covers the inclusion of estimates based on the FAO methodology, with the requirement to provide a breakdown of oceanic tuna species catches by GEAR (i.e. species composition data summaries).

6. Assistance to Sub-DECAFIREP to produce raised Annual catch estimates

The workshop recommended that **DECAFIREP and WCPFC** develop and disseminate clear guidelines in order for the **Sub-DECAFIREP** offices (that have implemented the WPEA data collection system) to produce "raised" Annual catch estimates by GEAR and SPECIES.

7. Key additional information for Annual catch estimates

The workshop recommended that **DECAFIREP and Sub-DECAFIREP offices** continue to establish collaborative, cooperative and formal arrangements with the **COASTGUARD** offices, **BUYERS**, **PROCESSORS** and other relevant stakeholders with respect to the provision of key data used in the Annual catch estimation process.

Each **Sub-DECAFIREP office** should liaise with their respective **COASTGUARD/PORT AUTHORITY** office to collect and compile the total number of trips BY GEAR based on port entry/departure information, which will be used to raise the data collected under the WPEA project, but also produce better estimates of the BAC used in the FAO methodology.

The significant work undertaken and the lessons learnt by the WPEA **Sub-DECAFIREP offices** in forming collaborative relationships with key stakeholders should be formally documented by the **DECAFIREP** and made available to the other provinces over the coming year.

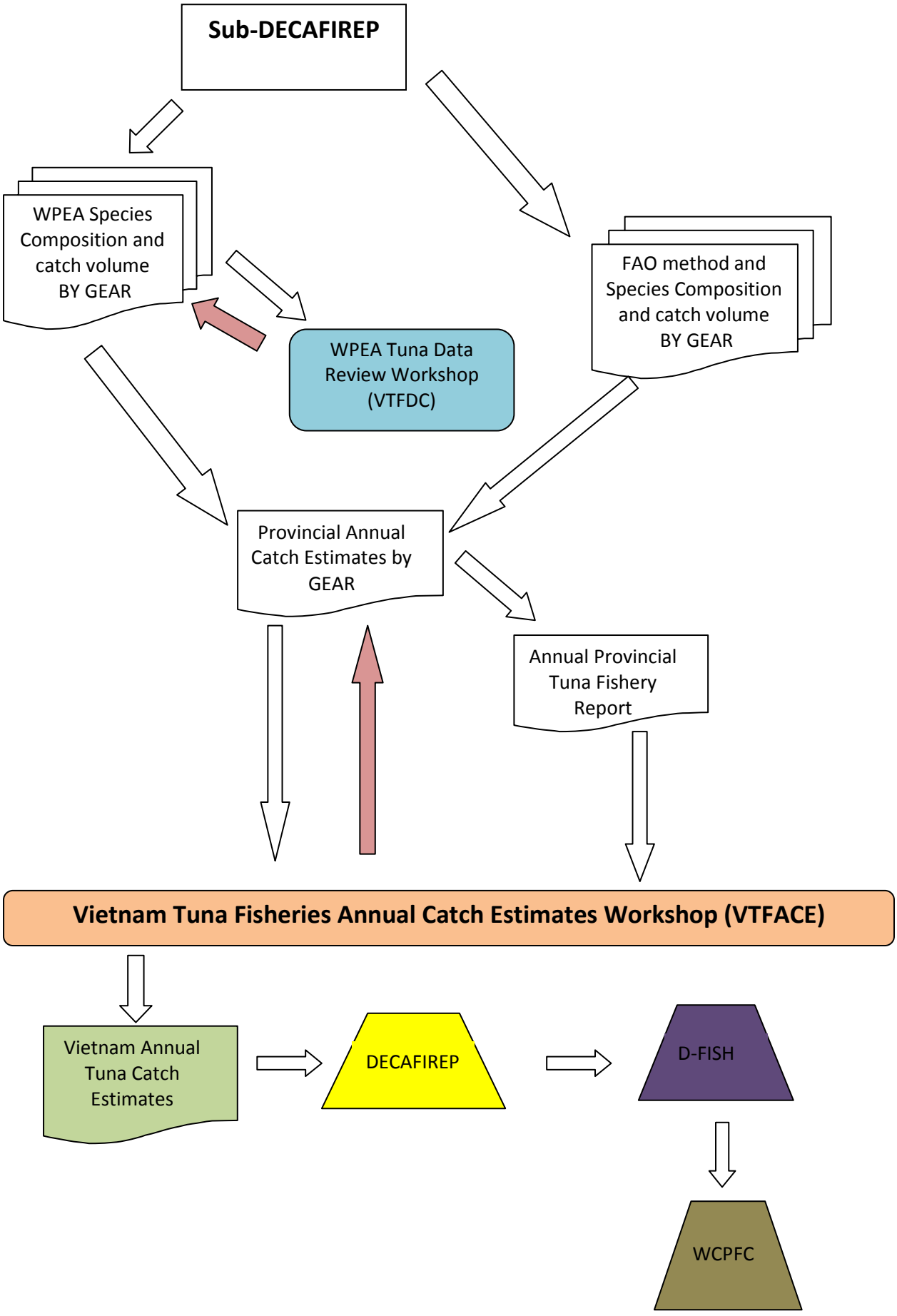
8. Tuna Fishery Profiles

The workshop recommended that **DECAFIREP and Sub-DECAFIREP offices**, with assistance from **WCPFC**, proceed to develop tuna fishery profiles for the six non-WPEA provinces over the coming year. The workshop also recommended that the existing tuna profiles for the three WPEA provinces are translated into Vietnamese/English and disseminated via appropriate web sites.

9. WPEA Tuna Data Management

The workshop recommended that **DECAFIREP and FICEN**, with assistance from **WCPFC**, investigate how to ensure the WPEA Tuna Fisheries data management (e.g. data entry, quality control, verification, reporting using the TUFMAN system) can be recognized and implemented as a permanent, sustainable activity within Vietnam in the future. It was suggested that the long-term objective is to have the data processing undertaken by the Sub-DECAFIREP offices who would then benefit with using the database Reporting system.

APPENDIX 5. Flowchart of the future Vietnam Annual Catch Estimation process



APPENDIX 6. Progress on Recommendations from VTFACE-1

FIRST VIETNAM ANNUAL TUNA CATCH ESTIMATES WORKSHOP

(VTFACE-1)

Da Nang, Vietnam

2–4 April 2012

RECOMMENDATIONS

PROGRESS ON RECOMMENDATIONS FROM VTFACE-1

DECAFIREP will arrange for a translation of the final version of the Recommendations into Vietnamese and then dissemination to Sub-DECAFIREP offices and other important stakeholders of the WPEA project in Vietnam. Responsibility for undertaking the work involved in each recommendation has been highlighted (bold/underlined).

1. **Annual tuna catch estimates**

   The provision of annual catch estimates is a fundamental reporting obligation for members, cooperating non-members and participating countries and territories (CCMs) of the WCPFC. While this initial workshop was very useful in producing historical tuna catch estimates for the first time, there remains considerable work to do and the workshop recommended **DECAFIREP and WCPFC** ensure that Annual Tuna Catch Estimates Workshops continue to be conducted on an annual basis.

   Future annual catch estimates workshops should be conducted in the same week, but after the annual WPEA Tuna Data Review Workshops. Both workshops should be conducted over two days each in March/April in the lead-up to the deadline for the provision of data to the WCPFC (30th April). In the longer term, it is envisaged that DECAFIREP will conduct these workshops without direct WCPFC involvement.

   Appendix 5 provides a flowchart of how the annual catch estimates process is intended to work.

VTFACE-2 was convened in 1-5 April 2013 and annual meetings are planned for future.

2. **Tuna Data Review Recommendations**

   The work on resolving problems highlighted in the recommendations from the most recent Tuna Data Review Workshop (see **Appendix 7**) was noted as critical for the annual catch estimation process and therefore all parties (**DECAFIREP, Sub-DECAFIREP, RIMF and WCPFC**) were again reminded to address these recommendations.

(These recommendations were reviewed at the VTFDC-4 meeting)

3. **Extending WPEA data collection to other provinces**

   The Workshop noted that oceanic tuna species are landed in other provinces and therefore recommended that **DECAFIREP and WCPFC** investigate what resources are required to extend data collection to these provinces as soon as possible. This evaluation will be included in the overall study on resource requirements for the next WPEA project, for example.

The requirement to cover other provinces has been specifically built into the project plan for WPEA Phase 2.

4. Species composition data by GEAR TYPE

The Workshop acknowledged that species composition data by GEAR is critical to the estimation of annual catch by species and strongly recommended that **DECAFIREP and Sub-DECAFIREP** offices compile (i) historical species composition data BY GEAR from available information, and (ii) start collecting reliable species composition data by GEAR, ideally through the WPEA data collection systems.

The reports prepared and presented at VTFACE-2 include estimates of total tuna catch by GEAR, but species composition estimates remains poorly covered and an important issue to address in the WPEA Phase 2 project.

5. Tuna Exports and Imports

The workshop noted the potential value in the export and import data and recommended that **DECAFIREP** investigate the possibility of breaking down the data, as follows :

- Exported tuna catch volume by "HS" category; conversion factors (to whole weight) could then be applied, in the case of HS 16 commodities
- Obtain more recent IMPORT data (i.e. needs to be updated)
- Other relevant information from the Ministry of Trade and Customs office to better differentiate the imports and exports. For example, compilation of the volume of tuna exports and imports at the processing plant or provincial level.

No significant progress over the past year and some negative developments that were reported to VTFACE-2 workshop.

6. Cooperation amongst regional organisations

The workshop noted the involvement of regional organizations in the process of estimating Vietnam tuna fishery catches and encouraged the involvement of **WCPFC, SEAFDEC and FAO-RAPA,** with each offering a certain specialist level of expertise to the process.

No action on this recommendation in the past year, but opportunities to collaborate will be pursued in the future. SEAFDEC provided a workshop on coastal species catch estimation in Vietnam involving 12 provinces.

7. Annual Provincial tuna fishery Reports and dissemination of WPEA data summaries to Sub-DECAFIREP

The workshop recommended that **Sub-DECAFIREP** offices prepare an annual provincial tuna fishery report to be submitted to DECAFIREP. The type of report produced by some provinces for this workshop is a good template for what is expected and these reports would then serve as input into the annual WPEA workshops. It is acknowledged this is a long-term goal which can be done by some

provinces with WPEA data collection now, but not other provinces. **WCPFC** will provide more guidance on an appropriate template for the report.

The workshop recommended that **DECAFIREP** provide the Sub-DECAFIREP offices with quarterly data summaries of WPEA data collected in the province which can also be included in the annual provincial tuna fishery report. One suggestion was to establish secure web pages so that the provincial data summaries can be updated, viewed and downloaded at any time via the internet.

The provincial reports prepared and presented at VTFACE-2 are based on a template provided by WCPFC and DECAFIREP and provide usual information. Suggestions for improvement will be reviewed during VTFACE-2. No action with respect to provision of quarterly summaries by DECAFIREP to Sub-DECAFIREP offices at this stage.

8. New fishing methods for oceanic tuna

The workshop recommended that **DECAFIREP and Sub-DECAFIREP** monitor and report on the extent of the new handline ("tuna/squid") fishery by purse seine (with lights) vessels, and with **WCPFC**, consider introducing new WPEA data collection forms to better collect the information from this new fishing method. Specifically, information is required from each province on when it started, approximately how many trips per year, and average catch in those trips when this method is used. Enumerators should separate the catch from this new fishing method out from the data collected for the purse seine activities.

A specific agenda item and presentations on the developments in the Handline fishery are covered in VTFACE-2. The report and related recommendations of VTFACE-2 will cover the continued work involved in monitoring the Handline fisheries, including a specific comprehensive report combining all information prepared and presented at VTFACE-2.

9. Key additional information for Annual catch estimates

The workshop recommended that **DECAFIREP and Sub-DECAFIREP** establish a formal arrangement with the **COASTGUARD** offices and **BUYERS** from each province to collect and compile the total number of trips BY GEAR based on port entry/departure information, which will be used to raise the data collected under the WPEA project.

Obtaining information from the COASTGUARD is difficult as it is in hard-copy format and requires some time to compile. **Sub-DECAFIREP** offices are asked to report at the next workshop what resources are required to compile this information.

The workshop acknowledged that other types of data will be available in the future to determine coverage, for example, Vessel Monitoring System (VMS) data.

COASTGUARD data by GEAR are fundamental to understanding the coverage of the WPEA data collection and are also very important to understanding the extent of activity in the non-WPEA provinces. The compilation and presentation of COASTGUARD data by GEAR in each province (WPEA and non-WPEA Provinces) in future VTFACE workshops is strongly recommended (see relevant VTFACE-2 recommendation).

APPENDIX 7. Implementation schedule for trial WPEA data collection for 2013

Application of FAO Method

During the 2nd Vietnam Tuna Fishery Annual Catch Estimates Workshop (VTFACE-2), while the six sub-DECAFIREP staff intended to continue applying FAO Method for their total annual catch estimation, they agreed to provide reference-based species composition as much as they can at VTFACE-3. For the calculation of species composition, they can collect useful data and information from various sources such as captains, middle men, buyers and/or processors. This additional activity will upgrade the estimated proportion of each species among the catch that was provided at VTFACE-2, which was based on their empirical observation at landing sites. The data and information related with species composition collected from various sources will be included in their report to the VTFACE-3, April 2014. For the inclusion of additional activity outputs in their report, some sub-DECAFIREP staff requested an official letter of request from DECAFIREP and the WPEA Project team will address their request.

Implementation of WPEA Method of Data Collection

The workshop noted that the three key tuna provinces (Binh Dinh, Phu Yen and Khanh Hoa) produced around 35,000 mt and the six provinces (Da Nang, Quang Nam, Quang Ngai, Ninh Thuan, Binh Thuan and Ba Ria Vung Tau) produced around 30,000 mt of oceanic tuna catch (bigeye, yellowfin and skipjack). While 12 enumerators are working on port sampling in the three key provinces for the collection of landed catch and biological data to estimate species composition, no port sampling in the six provinces could jeopardize the logical procedure of annual catch estimation at the VTFACE-3 in April 2014. Therefore the six provinces agreed to joint WPEA port sampling project activity in the later part of 2013, noting that all WCPFC Members, Cooperating Non-Members and Participating Territories are implementing WPEA Method.

In the margin of the VTFACE-2, the WPEA Project Team explained the synopsis of port sampling procedure, and the six Sub-DECAFIREP staff agreed to implement the WPEA Method of Data Collection as a trial as follows:

FOR EACH GEAR TYPE SELECTED FOR THE TRIAL:

a) Collect landed catch data (from captain/middle man/buyers/processors) from sampled landings using the "WPEA Landings Data Collection Form" with coverage stipulated in Table X.
b) Collect total number of returns to port by GEAR from coast guards
c) Conduct port sampling using WPEA Port Sampling Data Collection Form with coverage stipulated in Table X.
d) Sub-DECAFIREP staff provided the following landing sites for port sampling:

Province	Name of landing sites for port sampling
DA NANG	Cảng cá Âu Thuyền – Thọ Quan
QUANG NAM	Ky Hà
QUANG NGAI	Cổ Lũy, Sa Huỳnh
NINH THUAN	Ninh Chữ, Đông Hải
BINH THUAN	Phan Thiết Cửa, La Gi
BARIA VUNG TAU	Bến Đá, Bến Lội

For the training of sampling protocol and data collection form, the NTC will visit the six provinces during late April to early May 2013. The NTC will also provide all sampling equipment to Sub-DECAFIREP too. For this project activity, which may commence in June 2013 if all procedures are well prepared, WPEA will provide USD 300 per province for the hire of enumerators and administrative costs.

APPENDIX 8. Vietnam Provincial Annual tuna catch estimates

LONGLINE/HANDLINE by Province -- 2012

PROVINCE	Estimated Tuna Catch (metric tonnes)									Estimated Billfish Catch (metric tonnes)										TOTAL Tuna and Billfish
	Skipjack	%	Yellowfin	%	Bigeye	%	Albacore	%	Total tuna	Blue Marlin	%	Black Marlin	%	Striped Marlin	%	Swordfish	%	Others	%	
Binh Dinh	0	0%	7,603	70%	2,097	19%	23	0%	9,723	30	0%	43	0%	0	0%	20	0%	1,120	10%	10,936
Phu Yen	0	0%	3,780	70%	1,020	19%	0	0%	4,800	76	1%	76	1%	0	0%	76	1%	356	7%	5,385
Khanh Hoa	0	0%	782	51%	556	36%	0	0%	1,338	21	1%	23	2%	0	0%	25	2%	120	8%	1,527
WPEA Province TOTAL	0	0%	12,165	68%	3,673	21%	23	0%	15,861	127	1%	142	1%	0	0%	121	1%	1,596	9%	17,848
Ninh Thuan	0	0%	14	68%	4	21%	0	0%	18	0	1%	0	1%	0	0%	0	1%	2	9%	20
Binh Thuan	0	0%	0	68%	0	21%	0	0%	0	0	1%	0	1%	0	0%	0	1%	0	9%	0
Ba Ria - Vung Tau	0	0%	34	68%	10	21%	0	0%	44	0	1%	0	1%	0	0%	0	1%	4	9%	50
Quang Ngai	0	0%	245	68%	74	21%	0	0%	320	3	1%	3	1%	0	0%	2	1%	32	9%	360
Da Nang	0	0%	0	68%	0	21%	0	0%	0	0	1%	0	1%	0	0%	0	1%	0	9%	0
Quang Nam	0	0%	0	68%	0	21%	0	0%	0	0	1%	0	1%	0	0%	0	1%	0	9%	0
Others	0	0%	0	68%	0	21%	0	0%	0	0	1%	0	1%	0	0%	0	1%	0	9%	0
non-WPEA Province Total	0	0%	293	68%	88	21%	1	0%	382	3	1%	3	1%	0	0%	3	1%	38	9%	430
Vietnam Total	0	0%	12,458	68%	3,761	21%	24	0%	16,243	130	1%	146	1%	0	0%	124	1%	1,634	9%	18,278

Notes on sources of data and methodology

1	*Most of the LONGLINE/HANDLINE catch in 2012 should be attributed to the HANDLINE fishery. However, at this stage, it is not possible to determine what percentage of the total HL/LL combined catch should be attributed to HANDLINE.*
2	*Estimates for the **WPEA Provinces** determined from Landings data raised to total trips obtained from COASTGUARD data.*
3	*No HL/LL catch estimates in the following non-WPEA provinces. **Quang Nam, Binh Thuan***
4	***Da Nang --** Squid falling-net catches as estimated 317 t of tuna (YFT, FGT, BLT) YFT from hook and line bit this is counted under the other gears at this stage.*
5	*One Longline vessel come from **Ninh Thuan** and fish mainly in the Spratley Is. No information of catches at this stage. Assume an estimate of 20 t for the year.*
6	***Quang Ngai** -- Forty (40) Handline vessels catching an estimated 360 t. in 2012. These vessels could potentially offload in other Provinces.*
7	***Ba Ria - Vung Tau** -- 584 vessels using Hook and line to catch tuna with an estimated 857 t. of tuna in 2012, most of which is LONGTAIL tuna. YFT/BET is only about 5% (~ 44 t.)*
8	***Phu Yen** -- Assume an arbitrary estimate of 4,800 t. of YFT/BET since some landing sites were not covered by any data collection (i.e. Including Coastguard data).*
9	***Others** -- Some longline catch landed in Ho Chi Minh should be accounted for in future versions.*

GILLNET by Province -- 2012

PROVINCE	Estimated Tuna Catch (metric tonnes)									
	Skipjack	%	Yellowfin	%	Bigeye	%	Others	%	Total	Total Oceanic Tuna
Binh Dinh	15	88%	2	12%	0	0%	0	0%	17	17
Phu Yen	173	54%	12	4%	10	3%	125	39%	320	195
Khanh Hoa	9,266	66%	543	4%	259	2%	4,044	29%	14,112	10,068
WPEA Province TOTAL	9,454	65%	557	4%	269	2%	4,169	29%	14,449	10,280
Ninh Thuan	3,200	100%	0	0%	0	0%	0	0%	3,200	3,200
Binh Thuan	662	100%	0	0%	0	0%	0	0%	662	662
Ba Ria - Vung Tau	2,213	75%	177	6%	0	0%	550	19%	2,940	2,390
Quang Ngai	4,000	80%	150	3%	0	0%	850	17%	5,000	4,150
Da Nang	1,404	60%	140	6%	94	4%	702	30%	2,340	1,638
Quang Nam	55	30%	0	0%	0	0%	128	70%	183	55
Others	0	100%	0	0%	0	0%	0	0%	0	0
non-WPEA Province Total	11,534	81%	467	3%	94	1%	2,230	16%	14,325	12,095
Vietnam Total	20,988	73%	1,024	4%	363	1%	6,399	22%	28,774	22,375

Notes on sources of data and methodology

1	*Estimates for the **WPEA Provinces** determined from Landings data raised to total trips obtained from COASTGUARD data.*
2	***Da Nang**. 2,340 t. from 64 GN vessels in 2012. Assumed that species composition of SKJ:YFT:BET 60%:6%:4% of 2,340 t.*
3	***Quang Nam**. Assumed that species composition of SKJ:YFT:BET 30%:0%:0% of 183 t.*
4	***Quang Ngai**. Assumed that species composition of SKJ:YFT+BET 80%:3% of 5,000 t. An estimated 70-80% of the vessels could be landing their catch in other provinces.*
5	***Ninh Thuan**. Assumed that species composition of SKJ:YFT+BET 80%:0% of 4,000 t. Need to review the potential YFT and BET catches. Estimates for other oceanic tuna species forthcoming.*
6	***Binh Thuan**. 22 vessels with 4 t./trip. SKJ account for 60% so an estimate of 662 t. per year. Estimates for other oceanic tuna species forthcoming.*
7	***Ba Ria - Vung Tau**. Assumed that species composition of SKJ:YFT+BET 75%:6% of 2951 t.*
8	***Others**. We may have estimates from the other provinces not listed here (e.g. HCM, Hue, etc.)*

PURSE SEINE by Province -- 2012

PROVINCE	Estimated Tuna Catch (metric tonnes)									
	Skipjack	%	Yellowfin	%	Bigeye	%	Others	%	Total	Total oceanic tuna
Binh Dinh	6,615	69%	891	9%	456	5%	1,693	18%	9,655	7,962
Phu Yen	226	87%	30	11%	5	2%	0	0%	261	261
Khanh Hoa	13	65%	1	5%	1	5%	5	25%	20	15
WPEA Province TOTAL	6,854	69%	922	9%	462	5%	1,698	17%	9,936	8,238
PROVINCE	Estimated Tuna Catch (metric tonnes)									
	Skipjack	%	Yellowfin	%	Bigeye	%	Others	%	Total	Total oceanic tuna
Ninh Thuan	0	100%	0	0%	0	0%	0	0%	0	0
Binh Thuan	2,600	65%	200	5%	200	5%	1,000	25%	4,000	3,000
Ba Ria - Vung Tau	5,787	45%	772	6%	0	0%	6,300	49%	12,859	6,559
Quang Ngai	3,500	70%	500	10%	0	0%	1,000	20%	5,000	4,000
Da Nang	2,379	55%	822	19%	303	7%	822	19%	4,326	3,504
Quang Nam	1,518	93%	120	7%	0	0%	0	0%	1,638	1,638
Others	0	100%	0	0%	0	0%	0	0%	0	0
non-WPEA Province Total	15,784	57%	2,414	9%	503	2%	9,122	33%	27,823	18,701
Vietnam Total	22,638	60%	3,336	9%	965	3%	10,820	29%	37,759	26,939

Notes on sources of data and methodology

1	*Estimates for the **WPEA Provinces** determined from Landings data raised to total trips obtained from COASTGUARD data.*
2	***Da Nang**. All tuna species 4326 t. in 2012. Assumed that species composition of SKJ:YFT:BET 55%:19% :7% of 4326 t.*
3	***Quang Nam**. Assumed that species composition of SKJ:YFT+BET 38%:3% of 3994 t. There was an estimated 1,558 t. reported from PS 'light' vessels but these are not expected to catch any oceanic tuna species.*
4	***Quang Ngai**. Assumed that species composition of SKJ:YFT 70%:10% of 5000 t. An estimated 70-80% of the vessels could be landing their catch in other provinces.*
5	***Ninh Thuan**. Most PS vessels fish anchovy but few catch tuna. 37 PS vessels. In the future, need to consider how much tuna might be taken by "day" PS vessels.*
6	***Binh Thuan**. 40 PS vessels that fish SKJ, with 20 t. per trip/month, operates 7 months per year. Assumed that species composition of Khanh Hoa SKJ:YFT:BET 65%:5%:5% of 4,000 t.*
7	***Ba Ria - Vung Tau**. Assumed that species composition of SKJ:YFT+BET 45%:6% of 12,859 t.*
8	***Others**. We may have estimates from the other provinces not listed here (e.g. HCM, Hue, etc.)*

APPENDIX 9. Vietnam Tuna Fisheries Annual Catch Estimates

VIETNAM TUNA LONGLINE

Year	Active vessels	Estimated Tuna Catch (metric tonnes)									Estimated Billfish Catch (metric tonnes)								TOTAL Tuna and Billfish
		Skipjack	%	Yellowfin	%	Bigeye	%	Albacore	%	Total tuna	Blue Marlin	%	Black Marlin	%	Striped Marlin	%	Swordfish	%	
2000		0	0%	6,776	68%	2,479	25%	10	0%	9,266	323	3%	152	2%	0	0%	253	3%	9,993
2001		0	0%	8,292	79%	1,450	14%	11	0%	9,753	340	3%	160	2%	0	0%	266	3%	10,518
2002		0	0%	9,756	87%	614	5%	11	0%	10,382	362	3%	170	2%	0	0%	283	3%	11,197
2003		0	0%	8,179	73%	2,129	19%	11	0%	10,320	360	3%	169	2%	0	0%	281	3%	11,130
2004		0	0%	11,122	74%	2,781	19%	15	0%	13,918	486	3%	228	2%	0	0%	379	3%	15,010
2005		0	0%	10,895	70%	3,527	23%	16	0%	14,438	504	3%	236	2%	0	0%	394	3%	15,572
2006		0	0%	10,930	70%	3,538	23%	16	0%	14,483	505	3%	237	2%	0	0%	395	3%	15,621
2007		0	0%	11,270	70%	3,648	23%	16	0%	14,935	521	3%	244	2%	0	0%	407	3%	16,107
2008		0	0%	10,375	70%	3,358	23%	15	0%	13,748	480	3%	225	2%	0	0%	375	3%	14,827
2009		0	0%	9,244	70%	2,992	23%	13	0%	12,249	427	3%	200	2%	0	0%	334	3%	13,211
2010		0	0%	9,513	74%	2,441	19%	4	0%	11,958	418	3%	196	2%	0	0%	326	3%	12,898
2011		0	0%	9,031	70%	2,923	23%	13	0%	11,967	418	3%	196	2%	0	0%	326	3%	12,907
2012		0	0%	12,456	75%	3,761	23%	15	0%	16,232	130	1%	146	1%	0	0%	124	1%	16,632

Notes on sources of data and methodology

1	*The GSO estimate for 2008 was approximately 19,000 t. and the estimate derived from DECAFIREP and ALMRV/DECAFIREP data (Table 7 – see VTFACE-1 Document # 13 – Appendix 3) for 2008 was ~27,000 t., although the estimates from this latter source were closer to the GSO estimate for previous and subsequent years, so the GSO estimate (~19,000 t.) was deemed to be the more reliable estimate for 2008 by the workshop.*
2	*The GSO and DECAFIREP/ALMRV estimates were for ALL SPECIES and the target oceanic tuna estimates (yellowfin and bigeye tuna) were determined by applying recent observer-derived species composition estimates (that is, 71% of total catch represents YFT+BET catch). This produced an estimate of 13,700 t. for YFT and BET from the GSO data which is in line with the estimates determined from the WPEA data collection in recent years (YFT+BET : 12,000 t. for 2010 and 14,000 t. for 2011). Given that the GSO estimate could be reconciled with estimates derived from the WPEA data collection, the workshop agreed to apply the same methodology of estimating the YFT+BET from the GSO data for years 2000-2008.*
3	*Species composition data were available from the ALMRV for the period 2000-2004, so these were applied to the YFT+BET catch estimates to produce year-specific catch estimates for Yellowfin and bigeye tuna catch estimates. The ALMRV species composition data for the billfish species for 2000-2004 were deemed to be unusually high so were not considered. A review of the comprehensive ALMRV logbook data after the workshop was suggested in an attempt to obtain more reliable species composition data for years prior to 2009.*
4	*The workshop decided to use the WPEA species composition data for 2010 and 2011 to determine species catch estimates for 2005-2011, in the absence of any reliable year-specific data. In the interim, the WPEA species composition data (2010-2011) for billfish were used to produce estimates of billfish catches for the period 2000-2011.*
5	*Estimates for 2012 include the three central provinces (Binh Dinh, Phu Yen and Khanh Hoa). Estimates for the following six provinces are also now included Ba Ria - Vung Tau, Binh Thuan, Ninh Thuan, Quang Ngai, Quang Nam, Da Nang. The estimates from these six provinces are NOT included in the previous years.*
6	*In late 2011 and in 2012, most longline vessels changed to using HANDLINE gear, but it is not yet possible to separate out the HANDLINE catch estimates from the LONGLINE catch estimates, so for 2012, the estimates are for combined longline/handline.*

VIETNAM TUNA PURSE SEINE

Year	Active vessels	Estimated Tuna Catch (metric tonnes)							See NOTES
		Skipjack	%	Yellowfin	%	Bigeye	%	Total tuna	
2000		11,525	75%	3,534	23%	307	2%	15,367	
2001		12,130	75%	3,720	23%	323	2%	16,174	
2002		12,913	75%	3,960	23%	344	2%	17,218	
2003		12,836	75%	3,936	23%	342	2%	17,115	
2004		17,312	75%	5,309	23%	462	2%	23,082	
2005		17,959	75%	5,507	23%	479	2%	23,945	
2006		18,015	75%	5,525	23%	480	2%	24,020	
2007		18,576	75%	5,697	23%	495	2%	24,768	
2008		17,100	75%	5,244	23%	456	2%	22,800	
2009		12,926	75%	3,964	23%	345	2%	17,234	
2010		12,190	75%	3,738	23%	325	2%	16,253	
2011		12,190	75%	3,738	23%	325	2%	16,253	
2012		22,638	84%	3,336	12%	965	4%	26,939	

Notes on sources of data and methodology

1	*The oceanic tuna catch estimate for recent years according to the best information available for recent years (provincial profiles; VTFACE-1 Document #16 - Lewis, 2012) was in the order of 20,000-24,000 t. The GSO estimate for 2008 was approximately 57,000 t. and the estimate derived from DECAFIREP and ALMRV was about 27,000 t., which are significantly different. The estimate for the GSO can be explained since it contains ALL species catches which includes a large component of small pelagic species which are targeted by purse seine vessels using lights at night. An arbitrary estimate of about 40% of the total GSO catch was thought to represent the oceanic tuna catches and was applied to produce an estimate of SKJ+YFT+BET of about 22,800 t. which is in the range for the estimate provided recent provincial profiles (VTFACE-1 Document #16 - Lewis, 2012), and in the ballpark of the estimate derived by the ALMRV/DECAFIREP. The ALMRV/DECAFIREP estimate was thought to include ALL species which, after corrected to remove the non-oceanic species catches would make it an underestimate compared to the other sources of data; at this stage, it has been assumed that the ALMRV/DECAFIREP estimates for the purse seine fishery, as is, represents the oceanic tuna species catches only.*
2	*Not enough data have been collected and processed under the WPEA project as yet to provide any estimate from the purse seine fishery for recent years. The workshop agreed that the GSO estimate, corrected to include the oceanic tuna catches only, was the best available estimate given that it could be reconciled with the estimate from recent provincial profiles (VTFACE-1 Document #16 - Lewis, 2012). The workshop therefore agreed to apply the same methodology of estimating the oceanic tunas SKJ+YFT+BET from the GSO data for years 2000-2008 and accept the ALMRV/DECAFIREP estimates as provisional estimates for 2009-2011.*
3	*There are very few species composition data for the oceanic tuna species in the purse seine fishery available at this stage. An average species composition for SKJ/YFT/BET from the ALMRV data was applied to the total tuna catches for years in the range 2000-2009 and preliminary port sampling/landings data collected under WPEA project data were used to determine species composition for years 2010-2011. Further investigation of the ALMRV data may be required to obtain better species composition estimates for years prior to 2009.*
4	*Estimates for 2012 include the three central provinces (Binh Dinh, Phu Yen and Khanh Hoa). Estimates for the following six provinces are also now included Ba Ria - Vung Tau, Binh Thuan, Ninh Thuan, Quang Ngai, Quang Nam, Da Nang. The estimates from these six provinces are NOT included in the previous years.*

VIETNAM TUNA GILLNET

Year	Active vessels	Estimated Tuna Catch (metric tonnes)							See NOTES
		Skipjack	%	Yellowfin	%	Bigeye	%	Total tuna	
2000		8,164	91%	522	6%	315	4%	9,001	
2001		8,593	91%	549	6%	332	4%	9,474	
2002		9,147	91%	585	6%	353	4%	10,085	
2003		9,093	91%	581	6%	351	4%	10,025	
2004		12,263	91%	784	6%	473	4%	13,520	
2005		12,371	88%	982	7%	673	5%	14,026	
2006		12,409	88%	985	7%	675	5%	14,070	
2007		12,796	88%	1,016	7%	696	5%	14,508	
2008		11,779	88%	935	7%	641	5%	13,355	
2009		13,016	88%	1,033	7%	708	5%	14,757	
2010		11,866	88%	942	7%	646	5%	13,454	
2011		11,866	88%	942	7%	646	5%	13,454	
2012		20,988	94%	1,024	5%	363	2%	22,375	

Notes on sources of data and methodology

1	*The oceanic tuna catch estimates for recent years according to the best information available for recent years (VTFACE-1 Document #16 - Lewis, 2012) was in the order of 10,000-15,000 t. The GSO estimate for 2008 was approximately 30,000 t. and the estimate derived from DECAFIREP and ALMRV was about 67,000 t., which, as with the purse seine fishery, are significantly different. The larger estimates for both the GSO and the ALMRV/DECAFIREP data can be explained as they contain ALL species catches and include a significant component of neritic species (e.g. Longtail tuna-Thunnus tonggol and Spanish mackerel-Scomberomorus commerson) which are taken by gillnet vessels that operate close to the coast in the central provinces, or in the most northern and most southern areas of Vietnam where the continental shelf (i.e. shallow waters) extends well off the coast. The large difference in the ALL species estimates between GSO and ALMRV/DECAFIREP could be due to the GSO not accounting for catches in some areas where significant amount of neritic species are taken.*
2	*As with the purse seine gear, an arbitrary estimate of about 40% of the total GSO catch for GILLNET was thought to represent the oceanic tunas and was applied to produce an estimate of SKJ+YFT+BET of about 12,000 t. in 2008 which is in the range for the estimate provided in the provincial profiles (VTFACE-1 Document #16 - Lewis, 2012). It was more difficult to explain the ALMRV/DECAFIREP estimate for 2008 which, after applying the 40% for oceanic tunas, was about double the level from both the GSO-derived catch estimates and the estimates in the provincial profiles.*
3	*Not enough data have been collected and processed under the WPEA project as yet to provide any estimate from the gillnet fishery for recent years. The workshop agreed that the GSO estimate, corrected to represent the oceanic tuna catches only, was the best available estimate given that it could be reconciled with the estimates from the recent provincial profiles (VTFACE-1 Document #16 - Lewis, 2012). The workshop therefore agreed to apply the same methodology of estimating the oceanic tunas SKJ+YFT+BET from the GSO data for years 2000-2008 and accept the ALMRV/DECAFIREP estimates (after adjustment to the GSO estimate of 2008) as provisional estimates for 2009-2011.*
4	*Species composition data for the oceanic tuna species in the gillnet fishery are available from the ALMRV for years 2000-2004 and the average species composition for these years (2000-2004) was used to determined the individual species catch estimates for this period. The species composition data obtained from provisional WPEA port sampling (2011) were used to estimate species catch for years 2005-2011; the oceanic tuna species composition data from WPEA 2011 gillnet landings data for SKJ:YFT:BET was 85.2%: 5.8%; 3.5% and from WPEA 2011 port sampling data was 88.2%: 7.0%; 4.8%.*
5	*Estimates for 2012 include the three central provinces (Binh Dinh, Phu Yen and Khanh Hoa). Estimates for the following six provinces are also now included Ba Ria - Vung Tau, Binh Thuan, Ninh Thuan, Quang Ngai, Quang Nam, Da Nang. The estimates from these six provinces are NOT included in the previous years.*