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Q5PFES

SỔ TAY HƯỚNG DẪN

Công cụ hỗ trợ xây dựng bản đồ chi trả DVMTR
chạy trên nền phần mềm QGIS mã nguồn mở



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**Project "Sustainable Forest Management and Biodiversity Conservation" (VFBC)
funded by the United States Agency for International Development (USAID)**

INSTRUCTIONS HANDBOOK

Q5PFES

Ha Noi, 2022

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LIST OF ABBREVIATIONS

PFES	Payment for Forest environmental services
MARD	Ministry of Agriculture and Rural Development
FPDF	Forest Protection and Development Fund
GIS	Geographic Information Systems
GHG	Green house gases

CHAPTER I: CHAPTER I: GENERAL INTRODUCTION

The development of the Q5PFES plugin is part of the "Project on Sustainable Forest Management and Biodiversity Conservation" (VFBC) funded by the United States Agency for International Development (USAID).

To contribute to reducing greenhouse gas emissions and increasing carbon sequestration in Vietnam through efforts to reduce deforestation and natural forest degradation, and more effectively manage production forests, USAID has funded Support and implementation of the Sustainable Forest Management Component within the framework of the Project on Sustainable Forest Management and Biodiversity Conservation in 7 provinces: Lao Cai, Son La, Hoa Binh, Thanh Hoa, Nghe An, Quang Tri and Quang Tri. Quang Nam in the period from 2020 to 2025.

The overall objectives of the Sustainable Forest Management Component are 1) Reducing GHG emissions from conversion and degradation of natural forests; 2) Increase carbon sequestration through more efficient management of production forests; and 3) Improve the quality, diversity and productivity of natural production forests.

The Sustainable Forest Management component includes 5 specific objectives including: (1) Improving and expanding the model of community forest management; (2) Promote conservation-friendly businesses in forest-dependent communities; (3) Strengthening the law enforcement system for violations in the forestry sector; (4) Improvement of production forest management practices; and (5) Mobilizing domestic resources for forest protection and management.

CHAPTER II: GENERAL ISSUES ABOUT PAYMENT FORR FOREST ENVIRONMENTAL SERVICE MAP

2.1. Legal grounds

- Circular No. 26/2017/TT-BNNPTNT dated November 15, 2017 regulating monitoring of forest developments and forest development planning land.

- Circular No. 33/2018/TT-BNNPTNT dated November 16, 2018 Regulations on forest survey, inventory and monitoring.

- Decree No. 156/2018/ND-CP dated November 16, 2018 detailing the implementation of a number of articles of the forestry law.

2.2. Objective, scopes and applications

2.2.1. 2.2. Objective

Technical guidance on using Q5PFES plugin (running on Qgis software platform) to support the implementation of a PFES map to meet the requirements of Decree No. 156/2018/ND-CP dated November 16 2018.

2.2.2. Scopes

The Handbook was developed with the goal of providing technical guidance on using the Q5PFES plugin to develop a PFES map to meet the requirements of Decree No. 156/2018/ND-CP dated November 16th, 2018:

+ The system of forest protection and development funds at provincial and central levels;

+ Provincial Forest Ranger,

+ Forest owners who provide forest environmental services and belong to the region where paid by forest environmental services.

2.2.3. Guided Applications

Within the content of the Handbook, the technique of implementation a PFES map is guided step by step with the application of the Q5PFES plugin (running on the QGIS software platform developed) by the Institute of Forest Ecology and Environment on the basis of the Python programming language.

With the Q5PFES plugin based on QGIS software, input data for the development of a payment map for forest environmental services is used according to the guidance of Decree No. 156/2018/ND-CP dated November 16, 2018 including: payment map of the previous year, map of forest inventory, map of monitoring of forest changes in the current year. Going through each standard editing step, the Q5PFES plugin will automatically provide output products that meet the payment requirements of the Provincial Fund and the Regulations of Decree No. 156/2018/ND-CP Specifically: (1) Map of payment for forest environmental services, (2) System of forms No. 01, 02, Appendix V, Decree No. 156/2018/ND-CP for forest owners in group 1 and group 2.

2.3. Technical requirements of the PFES map

2.3.1. Concept of PFES map

The PFES map is a type of thematic map in which it conveys information about the amount of payment corresponding to each geographical space (each forest plot) and the beneficiaries of the forest.

The PFES map is used in the management and administration of the provincial FPDF in the annual payment work in each locality.

The PFES payment is developed on the base of the unit price paid for each hectare of forest converted in each watershed set by the Provincial People's Committee according to the approved annual payment plan and the current state of the forest, the current state of the forest and management of each province.

2.3.2. Regulations of the data fields of the forest status map for PFES

The forest status map layer used for the Q5PFES plugin is a shapefile (.shp) layer and needs the necessary information fields described in the following table.:

Table 2.1: Regulations on attribute data fields of forest status map layer

No.	Field name	Type	Length	Precisions
1	tt	Integer64	10	0
2	matinh	Integer64	10	0
3	tin	String	50	0
4	mahuyen	Integer64	10	0

No.	Field name	Type	Length	Precisions
5	huyen	String	50	0
6	maxa	Integer64	10	0
7	xa	String	50	0
8	tk	String	10	0
9	khoanh	String	5	0
10	lo	String	10	0
11	thuad	String	30	0
12	tobando	String	30	0
13	ddanh	String	30	0
14	dtich	Real	9	2
15	nggocr	Integer	5	0
16	ldlr	String	10	0
17	maldlr	Integer	5	0
18	sldlr	String	50	0
19	namtr	Integer64	10	0
20	mgo	Real	10	1
21	mtn	Real	10	1
22	malr3	Integer	5	0
23	dtuong	Integer	5	0
24	churung	String	100	0
25	machur	Integer	5	0
26	nguoink	String	50	0
27	mangnk	Integer	5	0
28	nguoitrch	String	50	0
29	mangtrch	Integer	5	0
30	kd	Real	20	2
31	vd	Real	20	2
32	vungchitra	Integer	1	0
33	chitra	Integer	1	0
34	khuvuc	Integer	1	0

No.	Field name	Type	Length	Precisions
35	dtichct	Real	9	2
36	k0	Real	3	2
37	k1	Real	3	2
38	k2	Real	3	2
39	k3	Real	3	2
40	k4	Real	3	2
41	dgia	Integer	10	0
42	thanhtien	Integer64	15	0
43	mucct	Integer	1	0
44	maluuvuc	String	100	0

For some specific FPDF, there are a few more fields in the data table such as: dtuongnk (String(50)), cql (String(20)), cmt (String(20)).

2.3.3. Meaning of the data fields of the forest status map layer Field names and meanings of each field are specifically defined as follows:

(1) TT: is the column recording the order of forest inventory plots, they are numbered from 1 to n, where n is the total number of forest inventory plots.

(2) Matinh: is the column with the code of the province, for example: Bac Kan is 6, Ha Tinh is 42... Codes of provinces, districts and communes are synchronized according to the regulations of the General Department of Land.

(3) Tinh: is the column for the name of the province.

(4) Mahuyen: is the column with the district code.

(5) Huyen: is the column for the district name.

(6) Maxa: is the column in which the commune's code is recorded.

(7) Xa: is the column for the name of the commune. The name of the commune is recorded according to the document of the Ministry of Natural Resources and Environment.

(8) TK: is a column with compartment code, in a province, compartment code do not overlap.

(9) Khoanh: is the column recording sub_compartment code, in each compartment, sub_compartment code does not overlap.

(10) Lo: is the column indicating the plot of the forest status, in each sub_compartment, the number of the plots do not overlap.

(11) Thuad: is the column indicating the number of the land plot (if any), each forest owner may have 1 or more land plots (or plots) on each land plot of a forest owner with one or more existing forest plots. Information on land plot number is recorded for reference while using the database, where there is no forest land allocation map, there is no information on land plot.

(12) Tobando: is the column numbering the cadastral map sheet of the forest plot.

(13) Ddanh: is the column of the village name.

(14) Dtich: is the column to record the area of the forest plot.

(15) Nggocr: is the column with the forest code by origin, there are three types of forests by origin with the following codes:

No.	Forest origin	Code of forest origin
1	Natural forest	1
2	Plantation forest	2
3	Land without forest	3

(16) LDLR: is the column indicating the status of forest and non-forest land (land type of forest) according to Circular 33. Each forest state has a unique symbol that is consistent across the country.

(17) Maldlr: is the column recording the code of the forest state, the code of the forest state is recorded in Circular 33.

(18) SLDLR: is the column indicating the name of the tree species or the group of plant species in the forest plot (only for Plantation forest).

(19) Namtr: is the column recording the year of planting for the plantation plot (only for Plantation forest).

(20) Mgo: is the column recording the volume of standing timber for the forest plot in units m³/ha.

(21) MTN: is a column recording the reserves of bamboo, coco, and areca palm for the forest plot in units of 1000 trees/ha. A forest plot can have both timber and bamboo reserves.

(22) MaLR3: is the column recording the code of the forest type according to the function of the forest plot, there are 3 types of forest function with the following codes.

No.	Forest type	Code of forest type
1	Protection Forest	1
2	Special-use forest	2
3	Production forest	3

(23) Dtuong: is the column recording the code of the land use object of the forest plot. There are 11 land users as follows.

No.	Forest land users	Abbreviations of forest land users	Code of objects using forest land
1	Household, individual	HGD	1
2	Community	CD	2
3	Commune People's Committee	UBNDX	3
4	Protection forest management board	BQLRPH	4
5	Economic organizations	TCKT	5
6	Foreign investment enterprises	DNNN	6
7	Science, technology, education and training organizations and enterprises	KHCN	7
8	Special-use forest management board	BQLRDD	8
9	Army Agency	DVVT	9

(24) Churung: is the column of the name of the forest owner or the name of the group of forest owners of the forest plot.

(25) Machur: is the column recording the forest owner's code. Each forest owner or group of forest owners in group I in a commune has a unique code, which is not identical with the code of another forest owner or group of forest owners. Code of group I forest owner can be ordinal number of group I forest owner in each commune.

Each group II forest owner in a province has a unique code, which is not identical with the code of other forest owners. Code of forest owner group II whose area is located in the province is determined by adding the ordinal number of that forest owner in the list of large forest owners in the province with 9000.

Each forest owner of group II with an area located in many provinces has a unique code, which is not identical with the code of other forest owners. Code of forest owner group II with area covering many provinces is determined by adding the ordinal number of this forest owner with 9500.

(26) NguoiNK: is the column to write the name of the person/household or group of households contracted to protect the forest plot.

(27) MangNK: is the column that records the code of the consignee. Each contract owner has a unique code that does not match the code of another contract owner in the same contracted forest owner.

(28) Nguoitrch: is the column for the name of the disputant who does not have a license to use, or is not prioritized in the statistics.

(29) Mangtrch: is the column for the disputing person's code. Each disputing person has a unique code that does not match the code of another disputing person in the same commune.

(30) KD: is the longitude column of the center of the forest inventory plot (updated from GIS software).

(31) VD: is the column recording the latitude of the center of the forest inventory plot (updated from GIS software).

(32) VungChiTra: Determining the status in the payment zone, inside the payment zone is 1 and outside the payment zone is 0.

(33) ChiTra: Determining the status of payment in the payment zone, if paid 1 and not paid 0.

(34) KhuVuc: Determining the status of difficult areas according to the Government's regulations for commune-level administrative units, the communes of Region I shall be recorded as 1, the communes of Region II shall be recorded as 2 and the communes of Region III shall be recorded as 3.

(35) Dtichct: is the payment area, which is the converted area equal to the product of the combined K coefficient (K0) with the supply area (Dtich)..

(36) K0: The composite K coefficient is equal to the product of the component K coefficients.

(37) K1: Adjustment coefficient for forest volume.

(38) K2: Adjustment coefficient for forest function.

(39) K3: Adjustment coefficient for forest origin.

(40) K4: Difficulty adjustment coefficient (According to the level of difficulty prescribed by the Prime Minister).

(41) DGia: Payment unit price in VND/ha.

(42) ThanhTien: Amount to be paid in VND/plot.

(43) MucCT: The payment level is based on the unit price paid, there are 7 payment levels as follows:

No.	Payment levels	Payment unit price
1	1	Up to 50,000 VND/ha
2	2	From over 50,000 to 100,000 VND/ha
3	3	From over 100,000 to 150,000 VND/ha
4	4	From over 150,000 to 200,000 VND/ha
5	5	From over 200,000 to 300,000 VND/ha
6	6	From over 300,000 to 500,000 VND/ha
7	7	Over 500,000 VND/ha

(44): Maluuvuc: is the watershed code.

2.4. Conditions on human resources and information infrastructure serving the development and management of the PFES map system

2.4.1. About human resources

For officials of provincial funds, when assigned the task of developing and managing the PFES map system according to the guidance of Decree No. 156/2018/ND-CP dated November 16th, 2018, it is necessary to have: the following experiences:

Table 2.2: Experience of officials for management of PFES map system

No.	Criteria	Requirement
1	Professional qualifications and work experience	- Having expertise in Forestry, Environment; - Working experience in the field of payment for forest environmental services and forestry.
2	Skill	Proficient use of software: - MapInfo; MapSource (GPS);- QGIS, Google Earth; - Office information technology.

2.4.2. About the information infrastructure system

Computer configuration to well meet the task of Developing and managing the PFES map system according to the guidance of Decree No. 156/2018/ND-CP dated November 16th, 2018, the Provincial Fund needs to equipped with a dedicated desktop computer, appropriately configured to perform technical tasks, map processing. The specific configuration of the dedicated computer is shown in the following table 2.3:

Table 2.3: Specialized computers for payment work

No.	Criteria	Requirement	Note
1	CPU	From Core i5 and above, speed from 2.0 GHz or higher,	
2	RAM	From 8GB.	
3	HDD	From 1TB, it is recommended to integrate at 128 GB SSD.	
4	Graphics card	2GB.	With HDMI
5	DVD Drive	Yes, optical.	

No.	Criteria	Requirement	Note
6	Screen	From 21 inches FHD and above.	
7	Operating system	Windows 8 (Windows 10 is recommended).	
8	Office software	Office 2013 or later.	
9	Map software	Qgis 3.10 or later (Recommended for 3.16).	

CHAPTER III: METHODS OF DEVELOPING PFES MAP WITH Q5PFES PLUGIN

3.1. General introduction about Q5PFES plugin

3.1.1. The main products of the software

- The map layer of payment for forest environmental services to forest owners is households, individuals, and village communities; Commune People's Committee.

- The map layer pays for forest environmental services to forest owners who are organizations.

- The summary table of payment area according to form No. 01 and 02 is specified in Appendix V of Decree No. 156/2018/ND-CP dated November 16th, 2018. Annual schedule of revenue and expenditure according to form No. 08, Appendix VI of Decree 156/2018/ND-CP. Notice of PFES payment according to form No. 10, 11 Appendix VI Decree 156/2018/ND-CP. Report on PFES results according to form No. 16, Appendix VI of Decree 156/2018/ND-CP.

3.1.2. Main functions

- Exploiting forest change monitoring data: Download the forest change monitoring map from the Postgres file. Automatically convert data from the format of Forest Inventory and Forest change monitoring to a standard format for Payments for Forest Environmental Services.

- Develop a PFES map: Automatically identify payment zone, identify payment object, identify difficult areas, update K-coefficient, calculate payment area and amount of money to pay for each forest plot and each forest owner providing services.

- Retrieve tables: Automatically extract forms No. 01 (Forest Owners of Group 1) and 02 (Forest Owners of Group 2) as specified in Appendix V of Decree No. 156/2018/ND-CP or specific forms of provincial funds. Annual schedule of revenue and expenditure according to form No. 08, Appendix VI of Decree 156/2018/ND-CP. Notice of PFES payment according to form No. 10, 11 Appendix VI Decree 156/2018/ND-CP. Report on PFES results according to form No. 16, Appendix VI of Decree 156/2018/ND-CP.

3.2. Working configuration settings

The Q5PFES integrates a working configuration feature with the aim of configuring compatible features according to the typical cases of each provincial fund in project area (especially typical forms). The remaining provinces will use a common configuration. Additionally, the users need to set up the folder configuration. This will help users easily to manage work results in 1 fixed folder.

The procedure is as follows:

Procedure 3.1: Working configuration settings

1. From the Q5PFES Plugin, Select “Working configuration settings”.
2. Select the working configuration.
3. Select working directory configuration
4. Click the “OK” button.

Applying Procedure is as follow:

Step 1: Start the working configuration settings module.

Start Qgis software > Select Q5PFES tab > Working configuration.

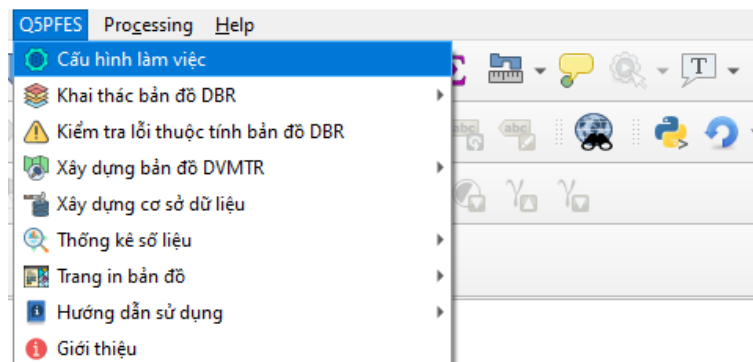


Figure 3.1. Start the working configuration settings module

Step 2: Select working configuration

In Figure 3.2, the default configuration of the plugin is the common configuration. Select the working configuration corresponding to the province to be selected. In the case of provincial funds that are not in the project area, the working configuration will be the common working configuration and this setting is not required.

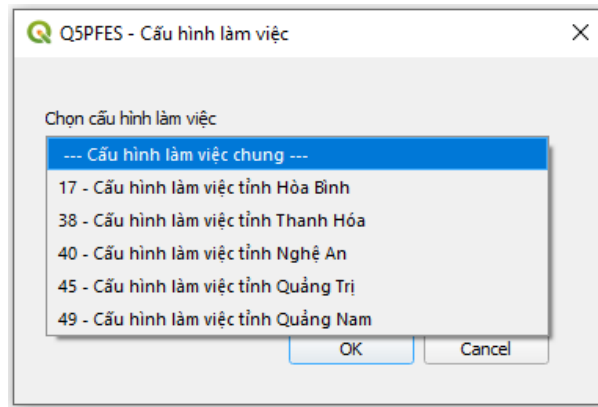



Figure 3.2. Select working configuration

Step 3: Choose working directory configuration

In Figure 3.3, in the window of the working configuration module, click on the icon  in the section working directory configuration to select the path to the directory containing the results of the work later.

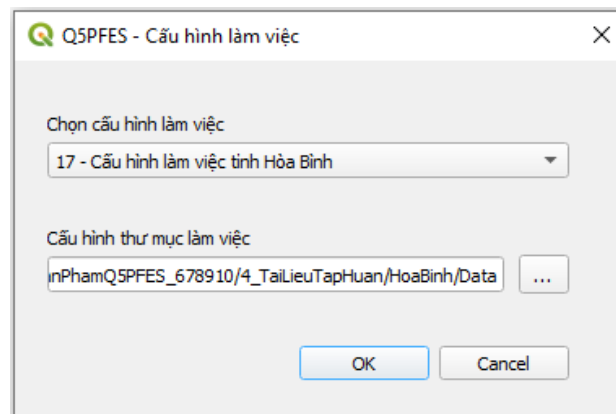


Figure 3.3. Select working directory configuration

Step 4: Click the “OK” button

The system will automatically configure the functions and paths according to the user's settings.

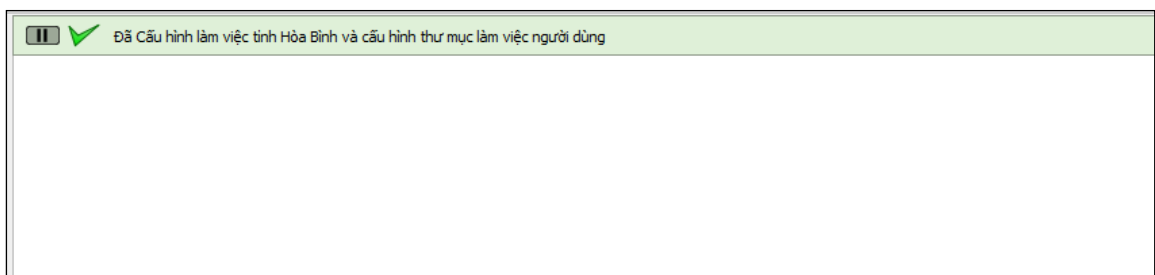


Figure 3.4. Setup working configuration successfully

3.3. Exploiting forest change monitoring data

The forest change monitoring map is exploited from the updated results of forest change monitoring until 31/12 every year from database of Provincial Forest Ranger Department. Q5PFES has integrated forest change monitoring map download feature extracted from FRMS-3.0.6 software. Users can use this feature with an account from VNFF's server (if having an account) or use the Postgres data from Provincial Forest Ranger Department.

Input data: Login information, account or Postgres data of the provincial forest ranger department.

The procedure is as follows:

Procedure 3.2: Download the forest change monitoring map

1. From the Q5PFES Plugin, Select “Extract map/Download Map”.
2. Click the “START” button in the connection section and then select the path to the Postgres folder.
3. Select the corresponding administrative level.
4. Click the “Browse” button in the Save As section to select the path to save the downloaded map file.
5. Click “Download”.

Apply procedure 3.2 to download the forest change map as follows:

Step 1: Start the forest change monitoring map downloader.

Start Qgis software > Select Q5PFES tab > Extract map > Download Map.

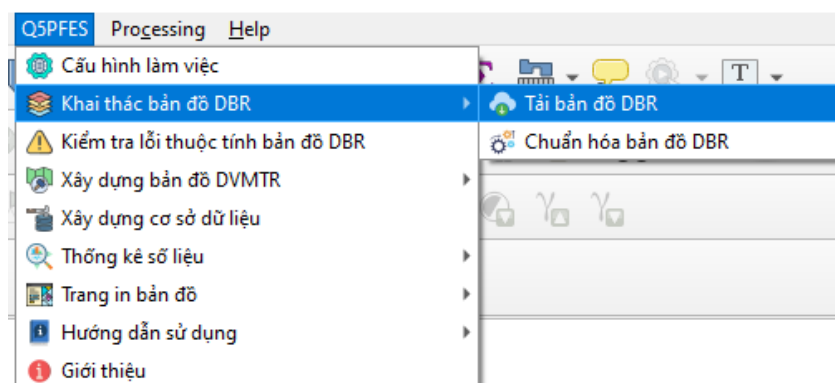


Figure 3.5. Start the forest change monitoring map downloader

Step 2: Check the connection information with the input data to start creating a connection with the Forest Protected Department's server.

In figure 3.6. Click the “Check” button in the Connection section. With first login. The system will say not connected to the local host server.

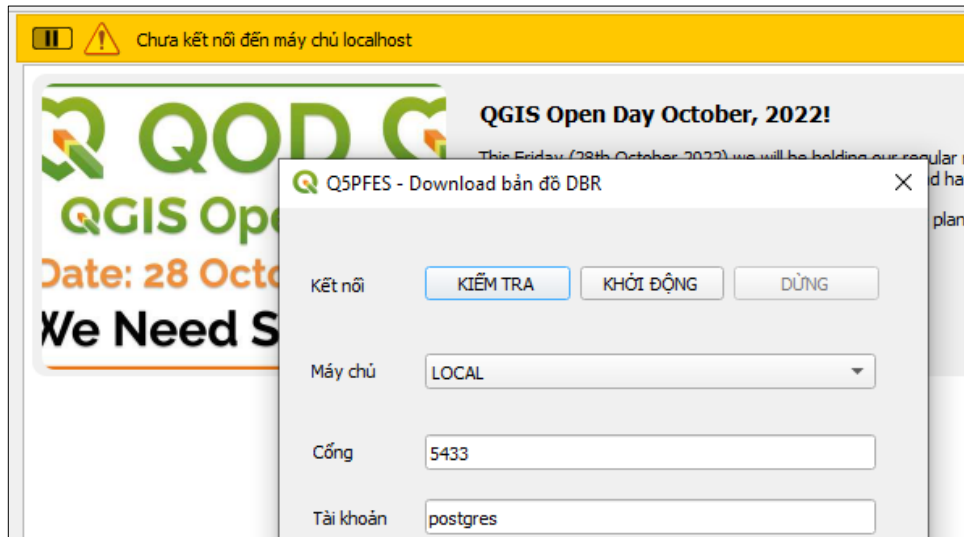


Figure 3.6. Check the connection to the server

Continue to press the "Start" button and then select the Postgres folder to start creating a connection with the localhost server.

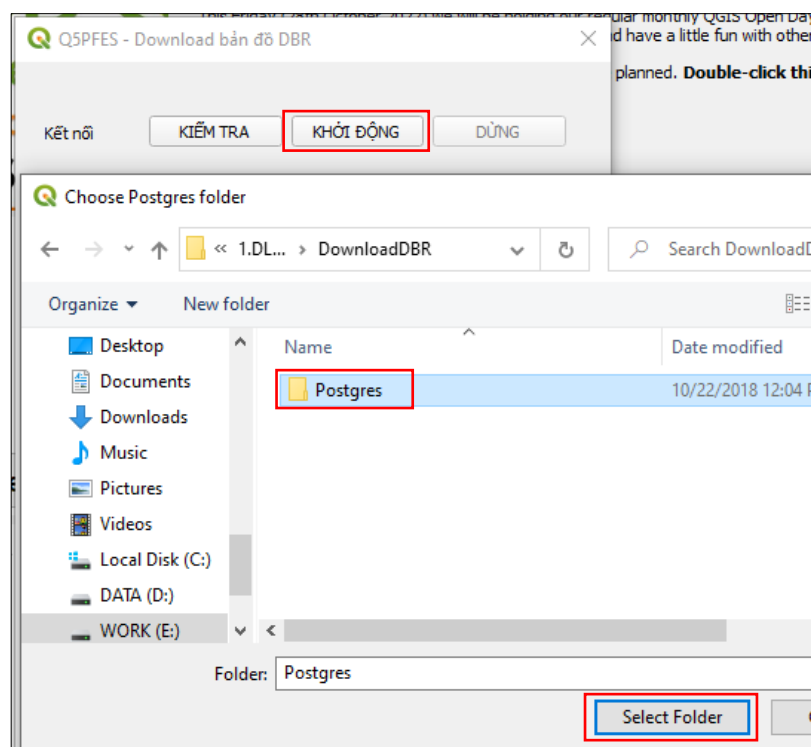


Figure 3.7. Select the Postgres folder

After successful connection. The system is ready to extract map.

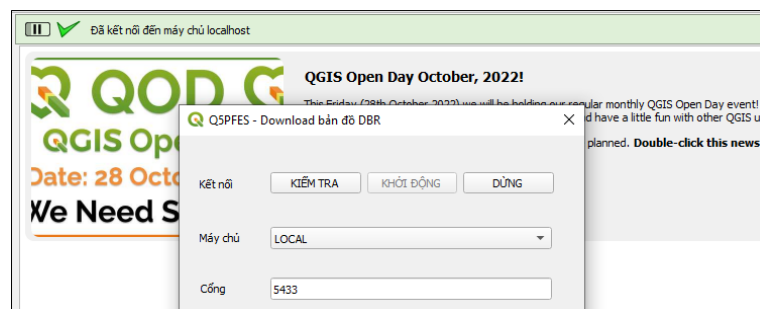


Figure 3.8. Successful connection

Step 3: Download the forest change monitoring data corresponding to the administrative level.

In Figure 3.9, select the corresponding administrative unit level in the Province, District, Commune (Select the province corresponding to the Postgres data of that province). If downloading map data at district level, do not select Commune, if downloading map data at provincial level, do not select Commune and District level. Then, click the "Browse" button in the Save As section and then select the folder path containing the output map layer. Finally, click the "Download" button to download the map.

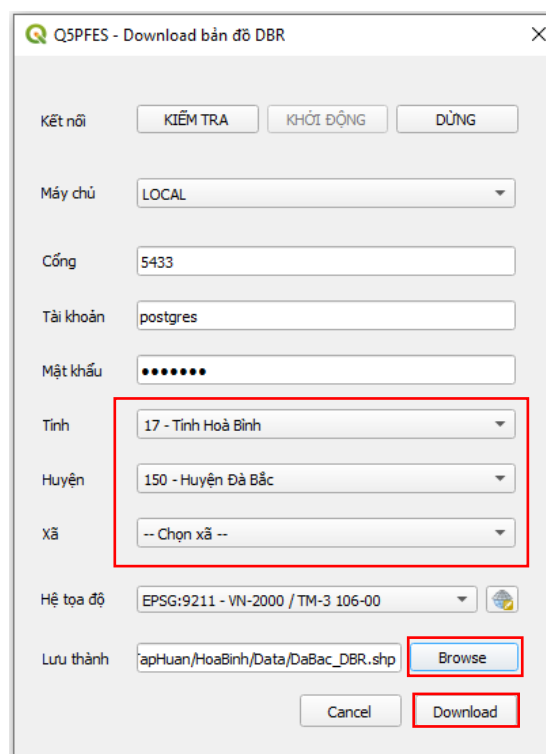


Figure 3.9. Select location to download map

The program will automatically download the forest change monitoring map from the Postgres folder. After the program is done, you can see the message of the download result in the Notification window.

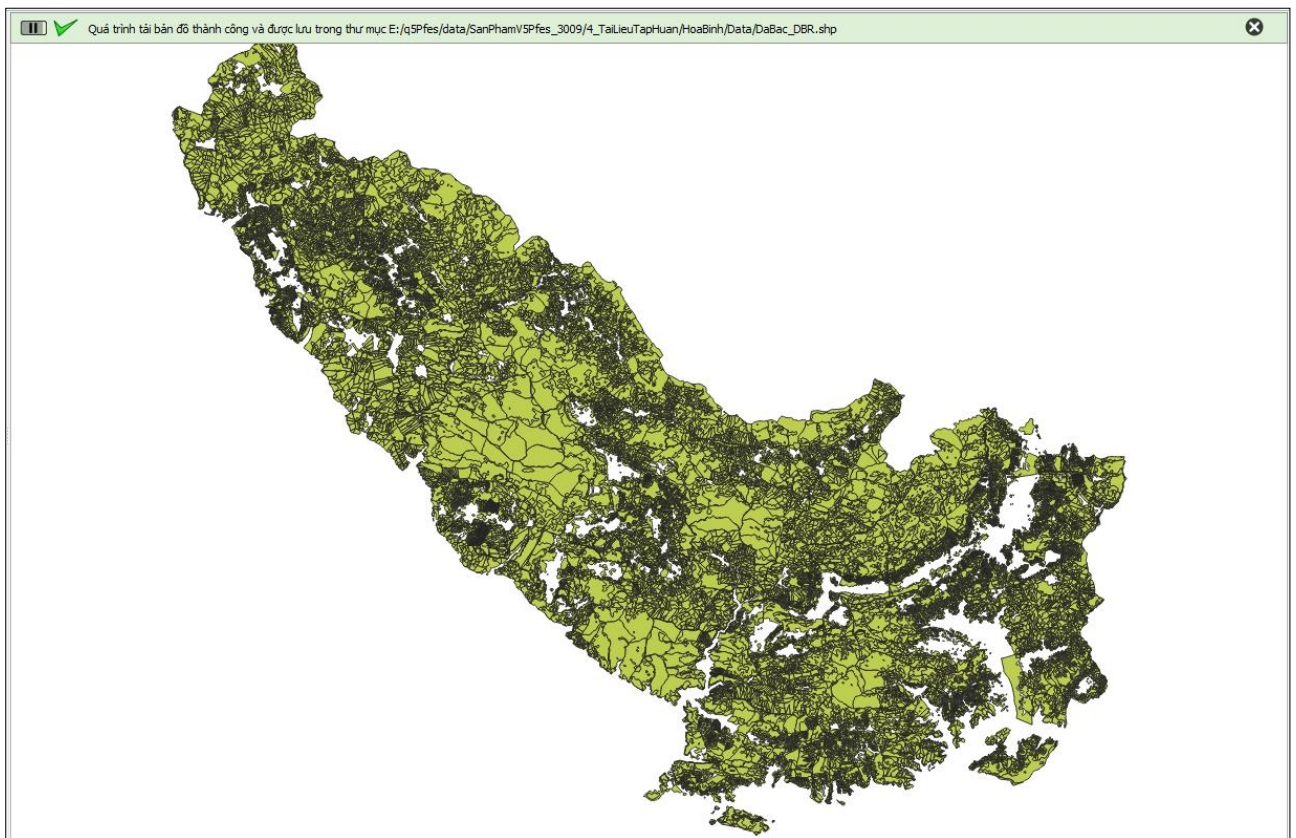


Figure 3.10 Downloaded forest change monitoring map

After finishing. Press stop to disconnect from the localhost server.

3.4. Checking for attribute field errors

The forest change monitoring map is exploited from the results of annual forest forest change monitoring updates from database of Provincial Forest Ranger Department. However, due to various reasons, there is still a possibility that there are forest plots that do not have uniformity in terms of data information between attribute fields about forest origin, forest type, forest feature, etc. Therefore, this map layer needs to be checked and standardized attribute fields before being built into a PFES map. The error checking algorithm for attribute fields of Q5PFES is: Each forest plot will be checked for synchronization between the fields of: "nggocr" and "maldlr", "ldlr" and "maldlr", "nggocr" and "sldlr", "malr3" and "nqh". After completing the checking process, the program will extract a detailed

summary table (Excel form) with asynchronous errors between the above attribute fields.

Input data: is the forest change monitoring map (usually with the word "DBR" at the end of the input map layer name) downloaded in procedure 3.2.

The procedure to check for attribute field errors is as follows:

Procedure 3.3: Checking for attribute field errors

1. From the Q5PFES Plugin, Select "Checking for attribute field errors".
2. Select the input map layer.
3. Click "OK".

Apply procedure 3.3 to check attribute errors for forest change monitoring map by following steps:

Step 1: Start the Checking for attribute field errors module: From the menu bar go to Q5PFES > Checking for attribute field errors.

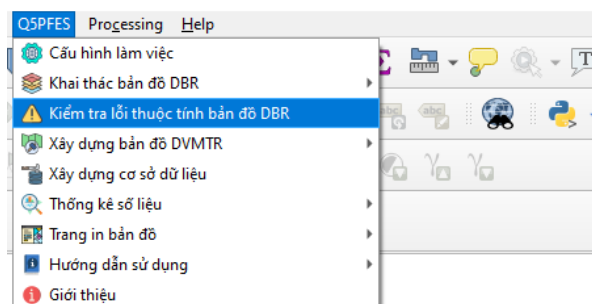


Figure 3.11. Start the Checking for attribute field errors module

Step 2: Select the input map layer.

In Figure 3.12, click the icon in the "Select forest change monitoring map" section to open the input map layer.

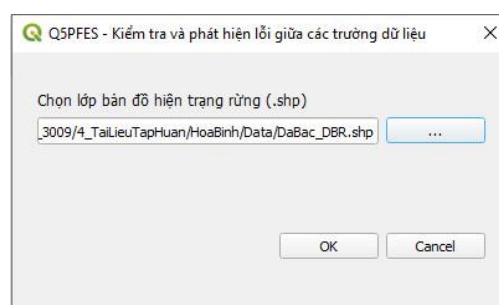
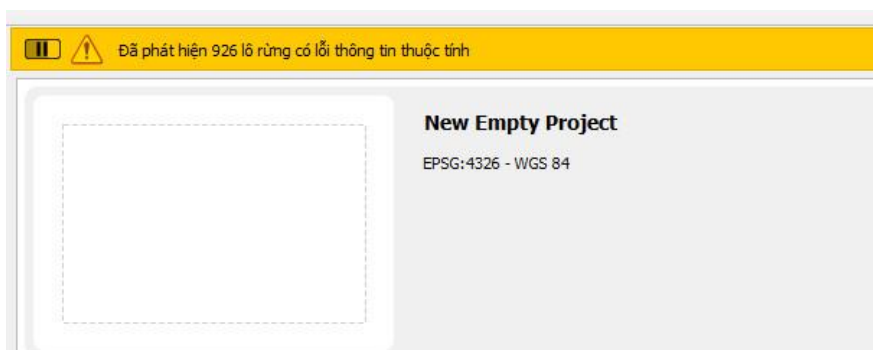


Figure 3.12. Checking for attribute field errors interface

Step 3: Click the “OK” button.

Wait for the program to execute, if it detects data information errors, the software will display a dialog box stating that number of plots have data errors and export a detailed error table.



Danh sách các lỗi rừng sai logic giữa các trường dữ liệu											
TT	Huyện	Xã	Tiểu khu	Khoảnh	Lô	nggocr	ldlr	maldlr	malr3	ngh	Kiểu lỗi
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
1	Huyện Đà Bắc	Xã Tiên Phong	35	20	8	0	DKH	93		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
2	Huyện Đà Bắc	Xã Suối Nánh	3	14	69	1	DT1	82	3	0	Lỗi sai logic giữa nguồn gốc rừng và mã loại đất loại rừng
3	Huyện Đà Bắc	Xã Yên Hòa	31	10	23	0	DKH	93		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
4	Huyện Đà Bắc	Xã Tiên Phong	35	21	3	0	MN	92		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
5	Huyện Đà Bắc	Xã Tiên Phong	35	9	4	0	MN	92		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
6	Huyện Đà Bắc	Xã Tiên Phong	35	23	19	0	MN	92		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
7	Huyện Đà Bắc	Xã Tiên Phong	35	14	11	0	MN	92		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
8	Huyện Đà Bắc	Xã Tiên Phong	35	22	6	0	MN	92		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
9	Huyện Đà Bắc	Xã Tiên Phong	35	28a	142a	0	DKH	93		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
10	Huyện Đà Bắc	Xã Yên Hòa	31	18	43	0	MN	92		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
11	Huyện Đà Bắc	Xã Yên Hòa	31	12	31	0	MN	92		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
12	Huyện Đà Bắc	Xã Mường Chiềng	8	11	38	0	DKH	93		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
13	Huyện Đà Bắc	Xã Mường Chiềng	8	11	80	0	MN	92		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
14	Huyện Đà Bắc	Xã Tiên Phong	35	22	3	0	MN	92		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
15	Huyện Đà Bắc	Xã Tiên Phong	35	22	1	0	MN	92		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
16	Huyện Đà Bắc	Xã Tiên Phong	35	9	5	0	MN	92		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
17	Huyện Đà Bắc	Xã Tiên Phong	35	5	8	0	MN	92		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
18	Huyện Đà Bắc	Xã Mường Chiềng	8	8	91	0	DKH	93		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
19	Huyện Đà Bắc	Xã Yên Hòa	31	16	48	0	MN	92		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
20	Huyện Đà Bắc	Xã Tiên Phong	35	24	119	0	MN	92		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng
21	Huyện Đà Bắc	Xã Tiên Phong	35	24	140	0	MN	92		1	Lỗi sai mà nguồn gốc rừng hoặc mã loại đất loại rừng

Figure 3.13. Summary table of attribute information error

3.5. Developing PFES map

3.5.1. Developing data structures

The feature of data structure developing of PFES map layer on Q5PFES is developed with the steps of adding the necessary attribute fields to forest change monitoring map to ensure the storage of necessary information for the implementation of PFES in each province and saving the watershed list information in the software database.

Before developing the data structure for the PFES map. We need to prepare a list of watersheds in the excel form (*.xlsx or *.xls) with the following columns:

Watershed Code (malv), Watershed Name (tenlv), Total Amount of Money (tongsotien) and Price (dgia)).

id	malv	tenlv	tongsotien	dgia
1	L0034	NMTĐ Hòa Bình	2,500,000,000	265,517
2	L0035	NMNS Vinaconex	1,500,000,000	4,348
3	L0047	NMTĐ Trung Sơn	1,500,000,000	53,416
4	L0048	NMTĐ Thanh Sơn	1,500,000,000	8,022
5	L0050	NMTĐ Bá Thước 1	2,000,000,000	7,582
6	L0051	NMTĐ Bá Thước 2	1,500,000,000	12,186
7	L0052	NMTĐ Cẩm Thủy 1	1,500,000,000	11,105
8	17N001	NMTĐ Đông Chum	1,500,000,000	51,247
9	17N002	NMTĐ Suối Nhập	1,500,000,000	29,321
10	17N003	NMTĐ So Lo 1	1,500,000,000	275,908
11	17N004	NMTĐ So Lo 2	1,500,000,000	220,375
12	17N005	NMTĐ Suối Tráng	1,500,000,000	70,500
13	17N006	NMTĐ Hồ Trộng	1,500,000,000	24,016
14	17N007	NMTĐ Vạn Mai	1,500,000,000	3,606
15	17N008	NMTĐ Miền Đồi	1,500,000,000	79,697
16	17N009	NMTĐ Định Cư	1,500,000,000	5,767
17	17N010	NMTĐ Suối Mu	1,500,000,000	160,801

Figure 3.14. Watershed list file structure

Input data: is forest change monitoring map downloaded in procedure 3.2 and standardized after checking for errors in the information in procedure 3.3.

The procedure of developing the data structure of the PFES map layer is as follows:

Procedure 3.4: Developing data structures

1. From the Q5PFES Plugin, Select “Developing PFES map/ Developing data structure”.
2. Select input map layer and watershed list file.
3. Select the path to save the output.
4. Click “OK”.

Apply procedure 3.4 to develop data structure for the forest change map layer according to the following steps:

Step 1: Start the developing data structure module: From the menu bar go to Q5PFES > Developing PFES map > Developing data structure.

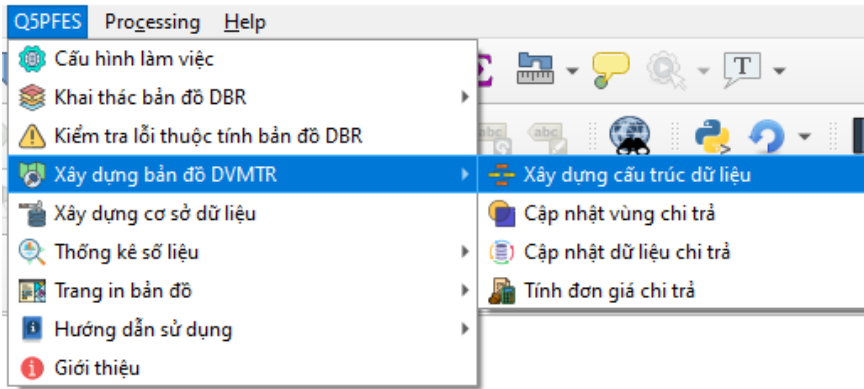


Figure 3.15. Start the developing data structure module

Step 2: Select the forest change monitoring map layer, the watershed list file and the resulting directory.

In Figure 3.16, click the icon in the section “Select forest change monitoring map” to open the input map layer.

At “Select watershed list” section, open the watershed list file.

Then choose the path to save the output.

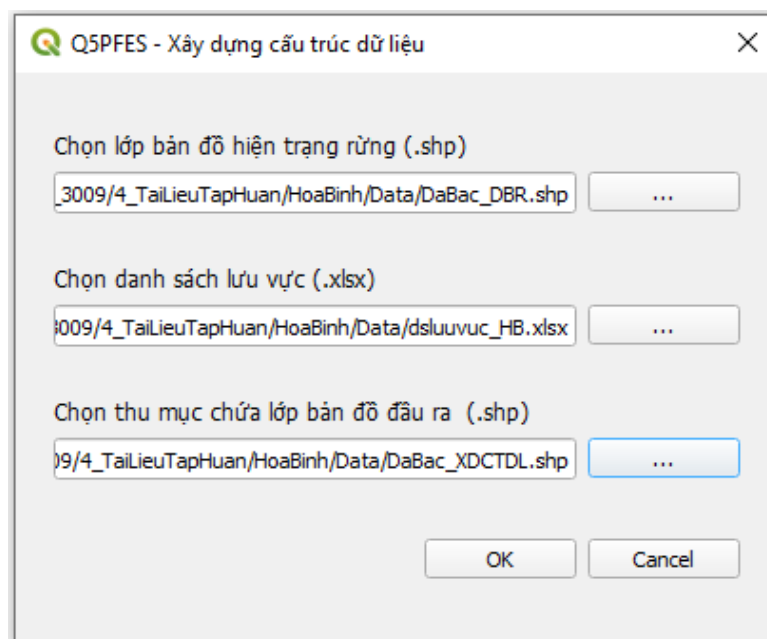


Figure 3.16. Developing data structure interface

Step 3: Click the “OK” button.

After clicking “OK”, wait for the program to work until the successful message appears.

vungchitra	chitra	dgja	dticht	thanhtien	k0	k1	k2	k3	k4	mucct	khuvuc	maluuvuc
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Figure 3.17. Data structure developing results

3.5.2. Update payment zone

The payment zone updating feature on Q5PFES is developed with the steps of using payment zone boundary map layer (or watershed boundary map) to overlap and then split to the map layer that has built the data structure in the previous step. Then updating the value = 1 in the "vungchitra" field for plots inside the payment zone boundary and updating the watershed code in the "maluuvuc" field to define forest environmental services supply zone.

Input data includes: map layer that has been structured in procedure 3.4 and map layers of the payment zone boundary (watershed boundary).

The procedure is as follows:

Procedure 3.5: Update payment zone

1. From the Q5PFES Plugin, Select "Developing PFES map/Update payment area".
2. Select the input map layer.
3. In the watershed selection section, select the watershed name and then select the corresponding watershed boundary map.
4. Select the output path
5. Click "OK".

Apply procedure 3.5 to update the payment zone of the PFES map by following steps:

Step 1: Start the Update payment zone module.

From the menu bar Q5PFES > Developing PFES map > Update payment zone.

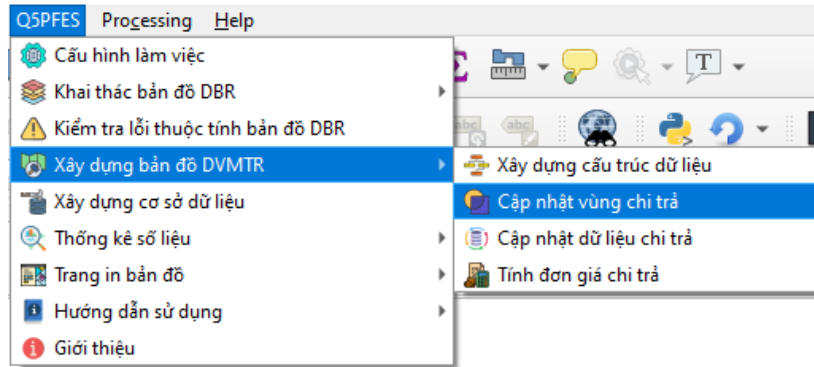


Figure 3.18. Start the Update payment zone module

Step 2: Select input data.

In Figure 3.19, click the icon in the "Select input map layer" section to open the input map layer.

In the “Select watershed” section, select the payment watershed. Then select the boundary layer of that watershed in the "Select watershed boundary layer" section.

Then choose the path to save the output.

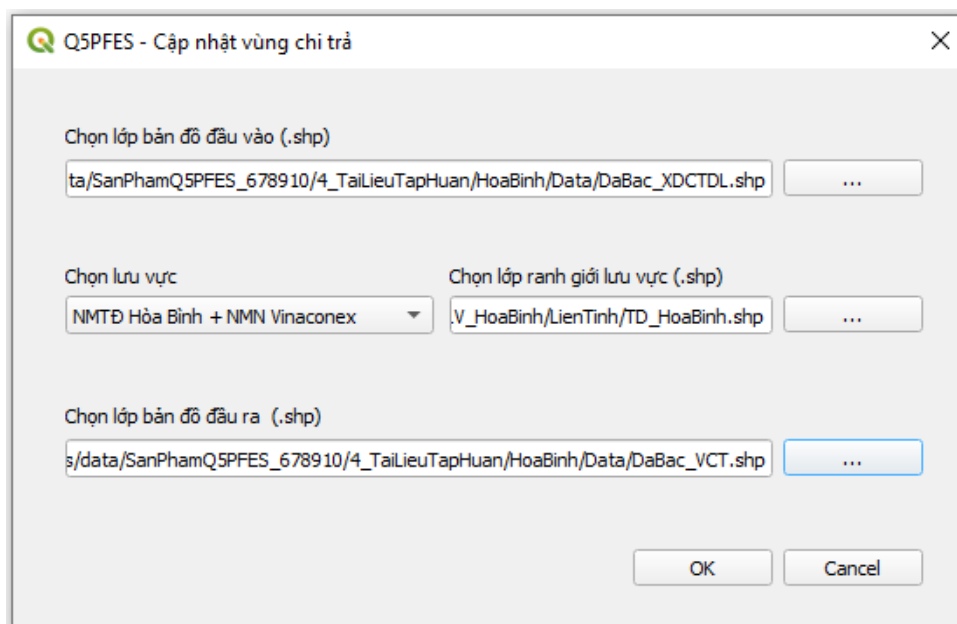


Figure 3.19. Update payment zone interface

Step 3: Click the “OK” button.

Wait for the program to execute until the dialog box that says "The payment zone was updated successfully".

In fact, this will take quite a while depending on the size of the map layers, or the user's computer configuration, please wait patiently.

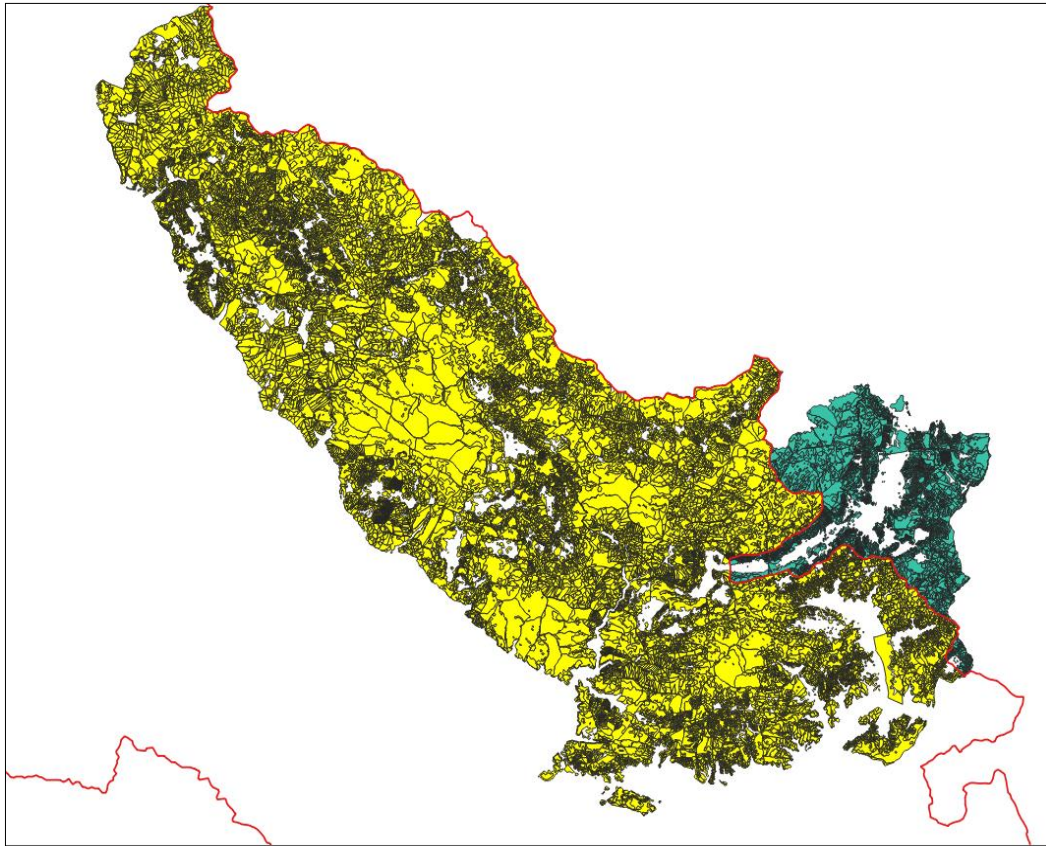


Figure 3.20 The payment zone was updated

3.5.3. Update payment data

The payment data updating feature on Q5PFES is built with the aim of: Identifying the exact forest plots that eligible to pay in the payment area. Inside the payment zone, there are many different states including forested area and non-forested area. The forested area in the payment zone is subject to be paid by forest environmental services, however some plantation tree species have not been eligibled to pay by forest environmental services so it is necessary to update the forest objects that eligible to pay. In addition, this feature also updates other necessary data such as difficult commune, K coefficient ... to serve the accurate calculation of the area of payment.

Input data is a map layer that has fully updated the payment zone according to procedure 3.5.

The payment data updating procedure is as follows:

Procedure 3.6. Update payment data

1. From the Q5PFES Plugin, Select “Developing PFES Map/Update Payment Data”.
2. Select the input map layer.
3. Select payment object, difficult communes, K-coefficient, type of area calculation.
4. Select the output path
5. Click “OK”.

Apply procedure 3.6 to update payment data for PFES map layer according to the following steps:

Step 1: Start the Updating Payment Data module.

From the menu bar Q5PFES > Developing PFES Map > Update payment data.

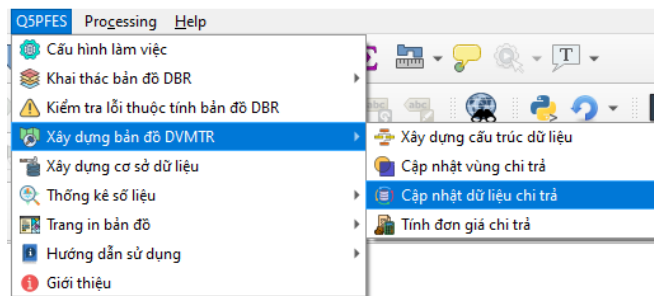


Figure 3.21. Start the Updating Payment Data module

Step 2: Select the payment object.

In Figure 3.22, click the icon in the "Select input map layer" section to open the input map layer.

In the payment object section, select the payment object by checking the corresponding checkboxes.

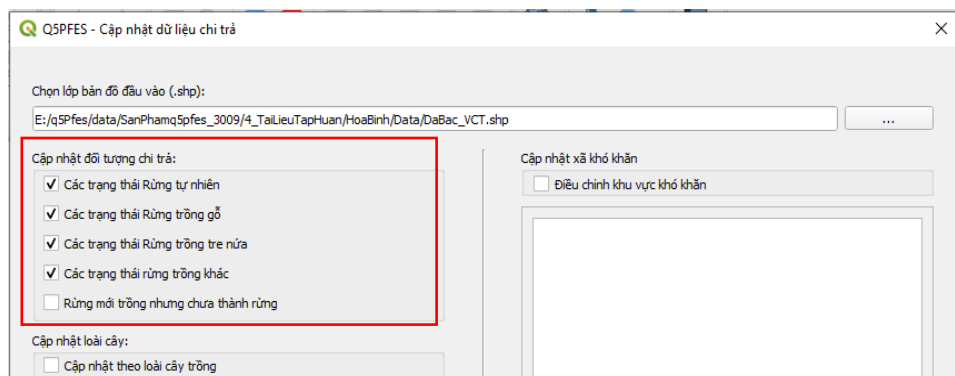


Figure 3.22. Select payment objects

In Figure 3.23, if you select Update by plant species, a list of planted species will appear and you can edit this list. In case, the tree species is not paid for PFES, change the number 1 in the Chitra column to zero.

Cập nhật loài cây:

Cập nhật theo loài cây trồng

	Tên loài cây	Chित्रा
1	Bồ đề+Luồng	1
2	Tre, nứa khác	1
3	Xoan	1
4	Bồ đề+Mỡ	1
5	Quế	0
6	Trầu+Keo	1
7	Bồ đề+Tếch (Gí...	1
8	Bạch đàn trắng ...	1
9	Lát hoa+Keo tai...	1
10	Bồ đề+Keo tai t...	1
11	Lát hoa	1

Figure 3.23. Update by plant species

Step 3: Adjusting difficult commune level

The level of difficulty commune is an indicator to determine the K4 coefficient. The level of difficulty is based on the Government's regulations under Decision No. 582/QĐ-TTg dated April 28th, 2017 (regulations may change from year to year). There are 3 difficulty levels corresponding to Region I, Region II and Region III. The difficulty commune information is stored in the field of the map and it has a value corresponding to the three regions 1, 2 and 3.

In Figure 3.24, in the section updating difficult communes, if you click Adjust difficult areas, the list of communes inside the payment zone will appear and you can edit this list, you need to fill 1 or 2 or 3 in the column “Khuvuc” corresponds to region I or region II or region III for each commune. In case of not clicking Adjust difficult areas, the software will update the difficult communes according to the original list of difficult communes.

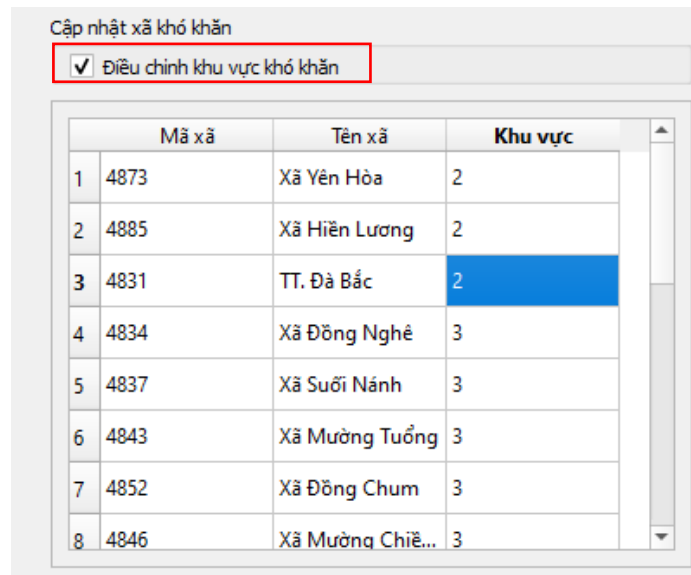


Figure 3.24. Update difficult commune

Step 4: Updating K coefficient

The K-coefficient is updated based on 4 components according to forest quality (K1), forest origin (K3), forest function (K2) and difficult commune level (K4). The operating principle of the program is based on the information in the database and the value of each K components specified in Circular 22 to update the fields k1, k2, k3 and k4 in the map. The composite K-factor is stored in the field k0 and is equal to the product of the K components. In case the K-factor is not applied, the program will update 1 for the composite K and the component K.

In Figure 3.25, in the section updating the K coefficient, if the K coefficient is not applied, do not select any K coefficient. If the coefficient K is applied, then in K coefficient section, select the K coefficients that need to be applied.

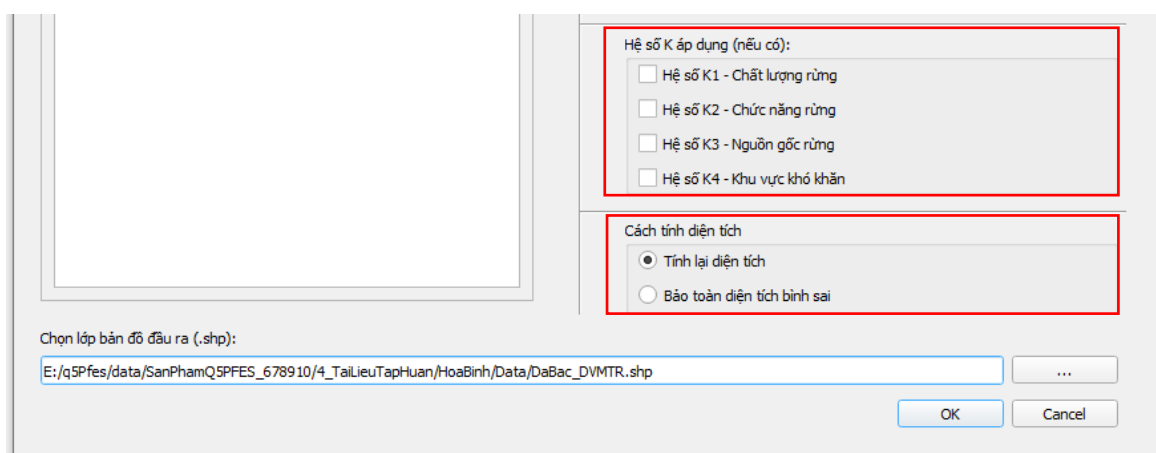
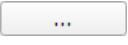


Figure 3.25. Updating K coefficient and area

Step 5: Updating the area

In Figure 3.25, select "Recalculate area" to recalculate the entire area field using the area calculation algorithm of QGIS software or select "Preserve the area of difference" to only recalculate the area of the plots that have been cut is located between the boundary of the payment area and the remaining plots are preserved.

Finally, click the icon  in the "Select output map layer" section to choose the path to save the output file.

Step 6: Click the "OK" button.

After selecting all the appropriate data, click "OK" then wait for the program to work until the successful message appears.

huyen	vungchitra	chitra	dgia	dtichct	thanhtien	k0	k1	k2	k3	k4	mucct	khuvuc	maluuvc
Huyện Đà Bắc	1	1	0	0.37	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	1.64	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	2.74	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	4.14	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	7.70	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.42	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.5	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.77	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	4.47	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	85.97	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.63	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.03	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.08	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.61	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.09	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	1.03	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	6.49	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.64	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	1.42	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	1.73	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	2.42	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.08	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.06	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.81	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.15	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.15	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.93	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	16.96	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	1.62	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108
Huyện Đà Bắc	1	1	0	0.26	0	1.0000	1.00	1.00	1.00	1.00	0	3	101+109+108

Figure 3.26. Payment data updated results

3.5.4. Calculate the unit price and determine the payment level

In this feature, the payment price of each watershed is calculated as the total amount collected by forest environmental services customer (hydroelectric plants, clean water plants) divided by the payment area calculated in the previous step. After that, the calculated payment price will be updated back to the watershed list in the database built in the previous steps. Based on the payment price information, the area to be paid, the program will automatically calculate the amount of money for each forest plot of the forest owner. At the same time, divide the payment levels into 7 levels.

- Level 1: From 0 to 50,000 VND/ha
- Level 2: From over 50,000 to 100,000 VND/ha
- Level 3: From over 100,000 to 150,000 VND/ha
- Level 4: From over 150,000 to 200,000 VND/ha
- Level 5: From over 200,000 to 300,000 VND/ha
- Level 6: From over 300,000 to 500,000 VND/ha
- Level 7: From over 500,000 VND/ha.

Input data is a map layer that has been updated with payment data according to procedure 3.6.

The procedure is as follows:

Procedure 3.7. Calculate the payment price and determine the payment level

1. From the Q5PFES Plugin, Select “Developing PFES map/Calculate payment price”.
2. Select the input map layer.
3. Select the watershed to calculate the price, write the total amount of money of watershed and then press the button “Calculate price”.
4. Customize the payment price and then click the button “Update payment price”
5. Select calculate the total price and determine the payment level.
6. Click “OK”.

Apply procedure 3.7 to calculate the payment price and determine the payment level with the following steps:

Step 1. Start the payment price calculator.

From the menu bar Q5PFES > Developing PFES map > Calculate payment.

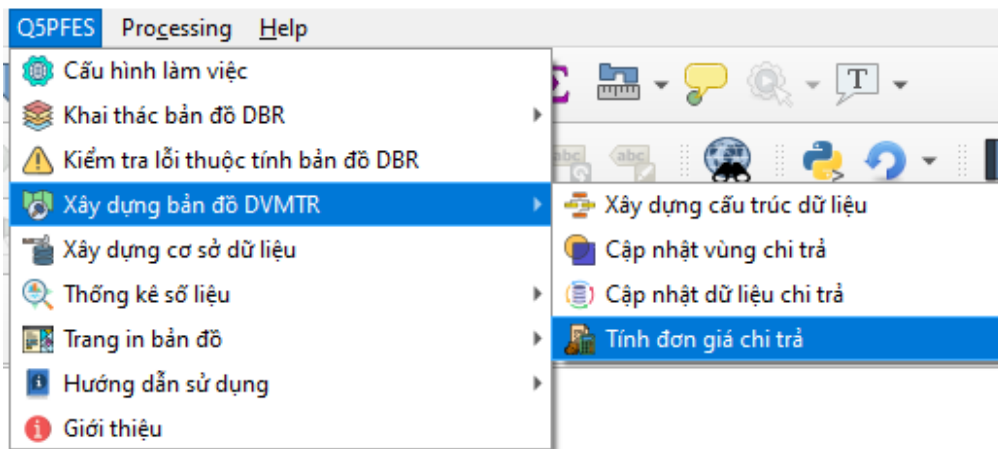


Figure 3.27. Start the payment price calculator

Step 2. Calculate payment price

In Figure 3.28, click on the icon in the section "Select input map layer" to open the input map layer.

In the watershed section, select the watershed to calculate the payment price. Then, in the total amount of money, adjust the amount of money collected from PFES customer of this watershed (if there is any change) and then press the button "Calculate payment price". The returned results will be displayed in the Payment Price section. Users can customize the price as desired and then press the "Update payment price" button to update the watershed list in the database.

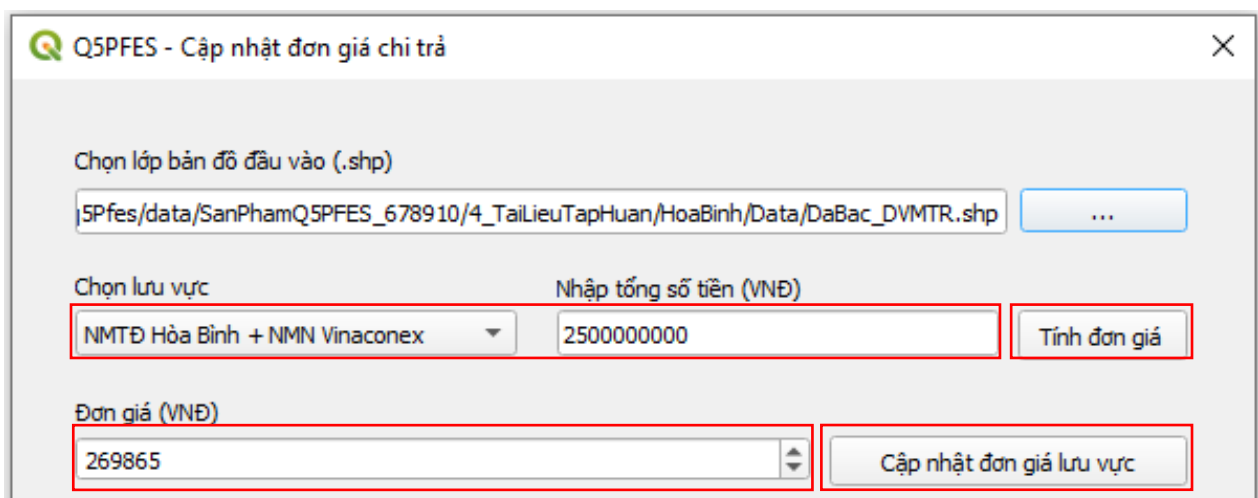


Figure 3.28. Calculate the payment price

Step 3: Determine the payment level.

In Figure 3.29, depending on each purpose, users can choose to calculate the total payment price and payment level (click the checkbox button) to update the PFES map.

Figure 3.29. Determine payment level

Step 4: Click “OK”.

After clicking “OK”, wait for the program to work until the successful message appears.

dgia	dtichct	thanh tien	k0	k1	k2	k3	k4	muuct
350433	0.37	129660	1.0000	1.00	1.00	1.00	1.00	6
350433	1.64	574710	1.0000	1.00	1.00	1.00	1.00	6
350433	2.74	960186	1.0000	1.00	1.00	1.00	1.00	6
350433	4.14	1450793	1.0000	1.00	1.00	1.00	1.00	6
350433	7.70	2698334	1.0000	1.00	1.00	1.00	1.00	6
350433	0.42	147182	1.0000	1.00	1.00	1.00	1.00	6
350433	0.5	175217	1.0000	1.00	1.00	1.00	1.00	6
350433	0.77	269833	1.0000	1.00	1.00	1.00	1.00	6
350433	4.47	1566436	1.0000	1.00	1.00	1.00	1.00	6
350433	85.97	30126725	1.0000	1.00	1.00	1.00	1.00	6
350433	0.63	220773	1.0000	1.00	1.00	1.00	1.00	6
350433	0.03	10513	1.0000	1.00	1.00	1.00	1.00	6
350433	0.08	28035	1.0000	1.00	1.00	1.00	1.00	6

Figure 3.30. Result of updating payment price and payment level

Up to this step, the PFES map layer has been developed with full information and can be used to export PFES statistical table.

3.6. Exploiting and using PFES map data

3.6.1. Import map data into the plugin's database

The final results developed to procedure 3.7 will be import to the plugin's database to manage and exploit necessary information, especially Forms 01 and 02 of Decree 156, these are two forms request the information to be extracted directly from the PFES map layer.

Provincial funds with their specific form will use their specific map layers to import to the plugin's database.

Input data is a complete PFES map layer that has been completed from procedure 3.4 to procedure 3.7 or a specific map layer of each province.

The procedure of importing map data:

Procedure 3.8. Importing map data

1. From the Q5PFES Plugin, Select “Create Database”.
2. Select input map layer.
3. Click “OK”.

Apply procedure 3.8 to import map data according to the following steps:

Step 1: Start the database creator.

From the menu bar >Q5PFES > Create Database.

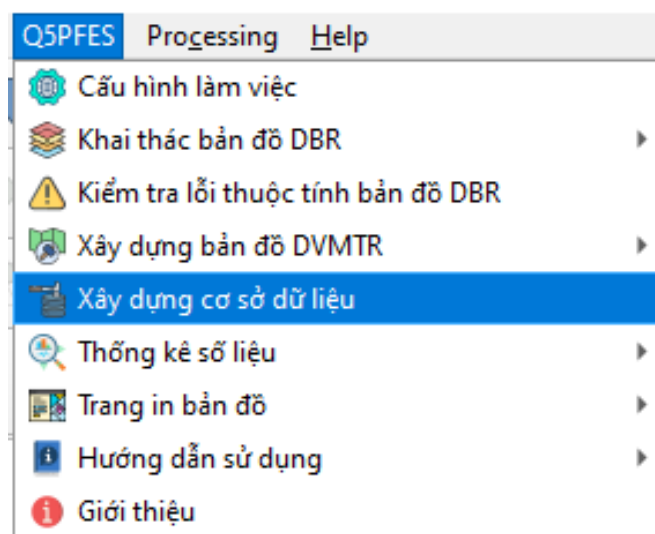


Figure 3.31. Start the database creator

Step 2: Select input map layer.

In Figure 3.32, select the input map layer as the complete PFES map developed from the previous steps or specific map layer of each province.

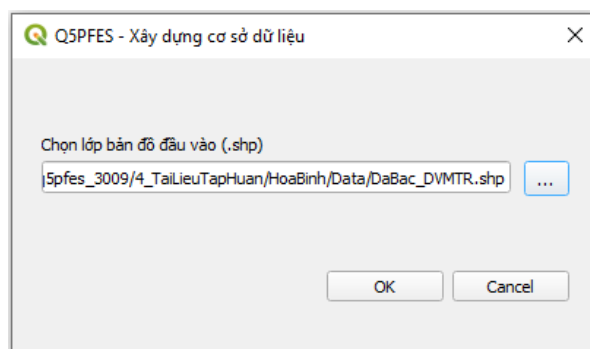


Figure 3.32. The database creator interface

Step 3: Click “OK”.

After clicking “OK”, wait for the program to work until the successful message appears.

At this point, we have been able to export a summary table according to forms 01 and 02 of Appendix V, Decree 156 and other specific forms of provincial funds.

3.6.2. Statistical

After importing data according to procedure 3.8, the plugin is ready to provide statistical data according to forms 01 and 02 in Appendix V, Decree 156 or other specific forms of provincial funds to serve payment work in localities.

The procedure is as follows:

Procedure 3.9. Exporting statistical data

1. From the Q5PFES Plugin, Select “Statistics/ Group 1 or Group 2 of Forest owner”
2. Select location (Group 1) or forest owner (Group 2).
3. Click “OK”.

Apply procedure 3.9 according to the following steps:

Step1: Start the statistical module.

From the menu bar > Q5PFES > Statistics.

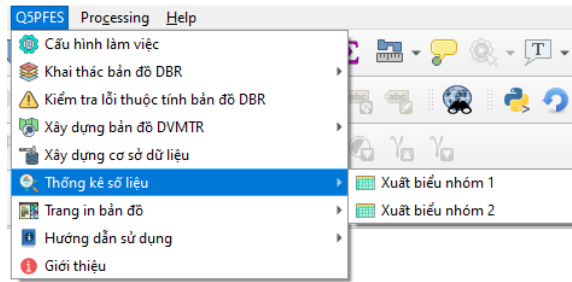


Figure 3.33. Start the statistical module

Step 2: Select the form type.

In this step, we have 2 options, which is to present to group 1 forest owners and group 2 forest owners.

In case of selecting group 1, we choose Group 1 report and then select the appropriate location level of each province.

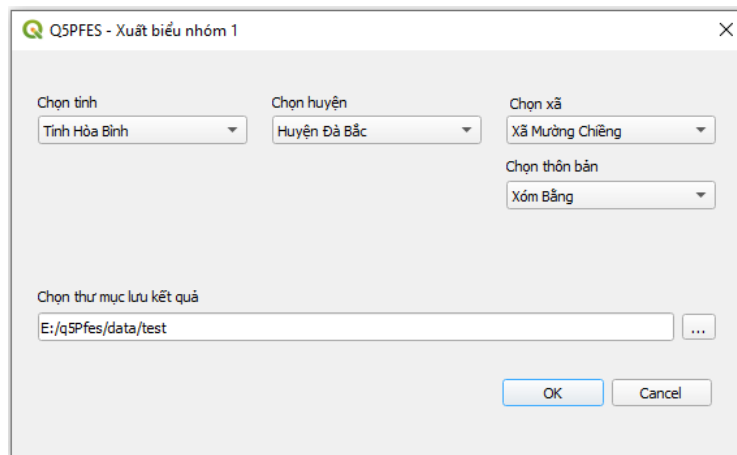


Figure 3.34. Exporting statistical data for Group 1

In case of selecting group 2, select the name of the forest owner to export. Finally, choose the folder path to save the results sheet.

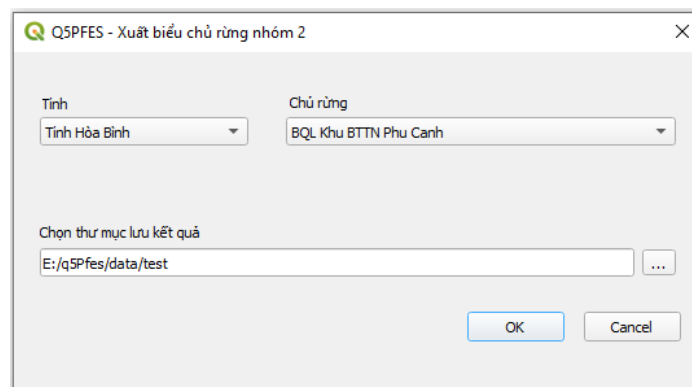


Figure 3.35. Exporting statistical data for Group 1

Step 3: Click “OK”.

After clicking “OK”, wait for the program to work until the successful message appears. The plugin will summarize the data and export it to excel table.

BIỂU TỔNG HỢP DIỆN TÍCH RỪNG CHI TRẢ DỊCH VỤ MÔI TRƯỜNG RỪNG												
Xã Mường Chiềng-Huyện Đà Bắc-Tỉnh Hòa Bình												
(Dành cho hộ gia đình, cá nhân, cộng đồng cư dân thôn, ủy ban nhân dân xã, tổ chức chính trị xã hội được Nhà nước giao trách nhiệm quản lý rừng)												
TT	Bên cung ứng dịch vụ môi trường rừng	Vị trí khu rừng				Diện tích cung ứng DVMTR (ha)	Hệ số K	Trong đó				Diện tích được chi trả DVMTR
		Lô	Khoảnh	Tiểu khu	Tên địa phương (nếu có)			K1	K2	K3	K4	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
I TÊN HỘ GIA ĐÌNH, CÁ NHÂN												
1	Hà Thị Tánh	8	13	42	Xóm U Quan	0.29	0.81	1	0.9	0.9	1	0.23
	Cộng					0.29						0.23
2	Hà Văn Cù	8	8	134	Xóm U Quan	0.34	0.81	1	0.9	0.9	1	0.28
	Cộng	8	8	150	Xóm U Quan	0.32	0.81	1	0.9	0.9	1	0.26
3	Hà Văn Dành	8	13	11	Xóm U Quan	0.64	0.81	1	0.9	0.9	1	0.52
	Cộng					0.64						0.52
4	Hà Văn Hạt	8	13	8	Xóm U Quan	0.21	0.81	1	0.9	0.9	1	0.17
	Cộng					0.21						0.17
5	Hà Văn Lắm	8	8	178	Xóm U Quan	0.39	0.81	1	0.9	0.9	1	0.32
	Cộng					0.39						0.32
6	Hà Văn My	8	13	36	Xóm U Quan	0.63	0.81	1	0.9	0.9	1	0.51
	Cộng					0.63						0.51

Figure 3.36. Results presented according to form 01 Appendix V, Decree 156

BẢNG TỔNG HỢP DIỆN TÍCH RỪNG ĐƯỢC CHI TRẢ DỊCH VỤ MÔI TRƯỜNG RỪNG										
(Áp dụng cho chủ rừng là tổ chức)										
1. Tên chủ rừng:		BQL Khu BTTN Phu Canh								
2. Địa chỉ:										
3. Nội dung tổng hợp:										
TT	Vị trí lô rừng			Diện tích cung ứng DVMTR (ha)	Hệ số K	Trong đó				Diện tích chi trả DVMTR (ha)
	Lô	Khoảnh	Tiểu khu			K1	K2	K3	K4	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
1	12	17	10	0.17	1	1	1	1	1	0.17
2	12	17	12a	1.26	1	1	1	1	1	1.26
3	12	17	23	31.79	1	1	1	1	1	31.79
4	12	17	25b	154.76	1	1	1	1	1	154.76
5	12	17	27a	10.74	1	1	1	1	1	10.74
6	12	17	31a	2.2	1	1	1	1	1	2.2
7	12	17	34	18.68	1	1	1	1	1	18.68
8	12	17	35	3.21	1	1	1	1	1	3.21
9	12	17	36	3.52	1	1	1	1	1	3.52
10	12	17	37	1.0	1	1	1	1	1	1.0

Figure 3.37. Results presented according to form 02 Appendix V, Decree 156

BIỂU TỔNG HỢP DIỆN TÍCH RỪNG CHI TRẢ DỊCH VỤ MÔI TRƯỜNG RỪNG														
Kóm Bàng-Xã Mường Chiềng-Huyện Đà Bắc-Tỉnh Hòa Bình														
(Dành cho hộ gia đình, cá nhân, cộng đồng cư dân thôn, thị trấn, tổ chức chính trị xã hội được Nhà nước giao trách nhiệm quản lý rừng)														
TT	Tên chủ rừng dịch vụ môi trường rừng	Thửa đất	Lô	Khu	Tiểu khu	Diện tích cung ứng DVMT (ha)	Hệ số K tổng hợp	Diện tích được chi trả DVMT (ha)	Tổng đơn giá chi trả	Trong đó, đơn giá từng lưu vực			Thành tiền	Ký hiệu
										NMTĐ Hòa Bình + NMN Vinaconex	NMTĐ Suối Nhập	NMTĐ Đổng Chum		
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10] = [8] x [9]	[11]	[12]	[13]	[14] = [9] x [10]	[15]
1	TÊN HỘ GIA ĐÌNH, CÁ NHÂN													
1	Bản Văn Châu Cộng	157	2	18	6	2,27	1,00	2,27	350,433,00	269,865,10	29,320,94	51,247,08	795,483,00	795,483,00
2	Bản Văn Duối Cộng	308	55	19	6	2,42	1,00	2,42	350,433,00	269,865,10	29,320,94	51,247,08	848,048,00	848,048,00
3	Bản Văn Hùn Cộng	213	32	18	6	1,56	1,00	1,56	350,433,00	269,865,10	29,320,94	51,247,08	546,675,00	546,675,00
4	Bản Văn Hoà Cộng	182	50	17	6	3,15	1,00	3,15	350,433,00	269,865,10	29,320,94	51,247,08	1.804.730,00	1.804.730,00
5	Bản Văn Hoàn Cộng	141 156	27 35	17 17	6 6	2,65 1,93	1,00 1,00	2,65 1,93	350,433,00 350,433,00	269,865,10 269,865,10	29,320,94 29,320,94	51,247,08 51,247,08	928.647,00 676.336,00	1.064.983,00
6	Bản Văn Hoảng Cộng	121 314	14 70	17 19	6 6	2,04 1,16	1,00 1,00	2,04 1,16	350,433,00 350,433,00	269,865,10 269,865,10	29,320,94 29,320,94	51,247,08 51,247,08	714.883,00 406.502,00	1.121.385,00
7	Bản Văn Minh Cộng	186	20	18	6	2,87	1,00	2,87	350,433,00	269,865,10	29,320,94	51,247,08	1.005.743,00	1.005.743,00
8	Bản Văn Nam Cộng	240	97	17	6	1,12	1,00	1,12	350,433,00	269,865,10	29,320,94	51,247,08	392.485,00	392.485,00
9	Bản Văn Nhật Cộng	733	86	18	6	1,82	1,00	1,82	350,433,00	269,865,10	29,320,94	51,247,08	637.788,00	637.788,00
10	Bản Văn Phú Cộng	489	82	18	6	3,48	1,00	3,48	350,433,00	269,865,10	29,320,94	51,247,08	1.219.507,00	1.219.507,00
11	Bản Văn Sơn Cộng	148	43	17	6	3,36	1,00	3,36	350,433,00	269,865,10	29,320,94	51,247,08	1.177.455,00	1.177.455,00
12	Bản Văn Thanh (B) Cộng	324	84	19	6	2,21	1,00	2,21	350,433,00	269,865,10	29,320,94	51,247,08	774.457,00	774.457,00
13	Bãi Thanh Minh	305 325	49 82	19 19	6 6	4,11 2,38	1,00 1,00	4,11 2,38	350,433,00 350,433,00	269,865,10 269,865,10	29,320,94 29,320,94	51,247,08 51,247,08	1.440.280,00 834.031,00	

Figure 3.38. Results presented to forest owners in group 1 according to the form of the Hoa Binh Fund

BIỂU TỔNG HỢP DIỆN TÍCH RỪNG CHI TRẢ DỊCH VỤ MÔI TRƯỜNG RỪNG														
BQL Khu BTN Phú Canh														
(Dành cho đối tượng chủ rừng nhóm II và các đơn vị, tổ chức được Nhà nước giao đất, giao rừng theo quy định)														
TT	Huyện	Xã	Lô	Khu	Tiểu khu	Diện tích cung ứng DVMT (ha)	Hệ số K tổng hợp	Diện tích được chi trả DVMT (ha)	Tổng đơn giá chi trả	Trong đó, đơn giá từng lưu vực			Thành tiền	
										NMTĐ Hòa Bình + NMN Vinaconex	NMTĐ Suối Nhập	NMTĐ Đổng Chum		
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10] = [8] x [9]	[11]	[12]	[13]	[14] = [9] x [10]	
1	Huyện Đà Bắc	Xã Tân Pheo	1	25	12	0,85	1,00	0,85	350,433,00	269,865,10	29,320,94	51,247,08	297.868,00	
2	Huyện Đà Bắc	Xã Tân Pheo	10	17	12	0,17	1,00	0,17	350,433,00	269,865,10	29,320,94	51,247,08	59.574,00	
3	Huyện Đà Bắc	Xã Tân Pheo	10	21	12	0,55	1,00	0,55	350,433,00	269,865,10	29,320,94	51,247,08	192.738,00	
4	Huyện Đà Bắc	Xã Tân Pheo	10	25	12	0,44	1,00	0,44	269,865,00	269,865,10			118.741,00	
5	Huyện Đà Bắc	Xã Tân Pheo	10	25	12	0,04	1,00	0,04	350,433,00	269,865,10	29,320,94	51,247,08	14.017,00	
6	Huyện Đà Bắc	Xã Tân Pheo	11	21	12	1,3	1,00	1,30	350,433,00	269,865,10	29,320,94	51,247,08	455.563,00	
7	Huyện Đà Bắc	Xã Tân Pheo	12	21	12	63,38	1,00	63,38	350,433,00	269,865,10	29,320,94	51,247,08	22.210.444,00	
8	Huyện Đà Bắc	Xã Tân Pheo	12	24	12	5,13	1,00	5,13	350,433,00	269,865,10	29,320,94	51,247,08	1.797.721,00	
9	Huyện Đà Bắc	Xã Tân Pheo	12a	17	12	1,27	1,00	1,27	350,433,00	269,865,10	29,320,94	51,247,08	445.050,00	
10	Huyện Đà Bắc	Xã Tân Pheo	13	21	12	4,38	1,00	4,38	350,433,00	269,865,10	29,320,94	51,247,08	1.534.897,00	
11	Huyện Đà Bắc	Xã Tân Pheo	13a	24	12	1,12	1,00	1,12	350,433,00	269,865,10	29,320,94	51,247,08	392.485,00	
12	Huyện Đà Bắc	Xã Tân Pheo	14	21	12	5,47	1,00	5,47	350,433,00	269,865,10	29,320,94	51,247,08	1.916.869,00	
13	Huyện Đà Bắc	Xã Tân Pheo	14	24	12	0,83	1,00	0,83	350,433,00	269,865,10	29,320,94	51,247,08	290.859,00	
14	Huyện Đà Bắc	Xã Tân Pheo	15	24	12	2,71	1,00	2,71	350,433,00	269,865,10	29,320,94	51,247,08	949.673,00	
15	Huyện Đà Bắc	Xã Tân Pheo	18	24	12	2,11	1,00	2,11	350,433,00	269,865,10	29,320,94	51,247,08	739.414,00	
16	Huyện Đà Bắc	Xã Tân Pheo	19	24	12	0,26	1,00	0,26	350,433,00	269,865,10	29,320,94	51,247,08	91.113,00	
17	Huyện Đà Bắc	Xã Tân Pheo	2	21	12	2,81	1,00	2,81	350,433,00	269,865,10	29,320,94	51,247,08	984.717,00	
18	Huyện Đà Bắc	Xã Tân Pheo	2	25	12	0,6	1,00	0,60	350,433,00	269,865,10	29,320,94	51,247,08	210.260,00	
19	Huyện Đà Bắc	Xã Tân Pheo	20	24	12	1,04	1,00	1,04	350,433,00	269,865,10	29,320,94	51,247,08	364.450,00	
20	Huyện Đà Bắc	Xã Tân Pheo	21	24	12	48,2	1,00	48,20	350,433,00	269,865,10	29,320,94	51,247,08	16.890.871,00	
21	Huyện Đà Bắc	Xã Tân Pheo	23	17	12	31,84	1,00	31,84	350,433,00	269,865,10	29,320,94	51,247,08	11.157.787,00	
22	Huyện Đà Bắc	Xã Tân Pheo	24	24	12	3,45	1,00	3,45	350,433,00	269,865,10	29,320,94	51,247,08	1.208.994,00	
23	Huyện Đà Bắc	Xã Tân Pheo	25b	17	12	154,79	1,00	154,79	350,433,00	269,865,10	29,320,94	51,247,08	54.243.524,00	
24	Huyện Đà Bắc	Xã Tân Pheo	26	24	12	2,91	1,00	2,91	350,433,00	269,865,10	29,320,94	51,247,08	1.019.760,00	
25	Huyện Đà Bắc	Xã Tân Pheo	27a	17	12	10,73	1,00	10,73	350,433,00	269,865,10	29,320,94	51,247,08	3.760.146,00	
26	Huyện Đà Bắc	Xã Tân Pheo	28	24	12	5,54	1,00	5,54	350,433,00	269,865,10	29,320,94	51,247,08	1.941.399,00	
27	Huyện Đà Bắc	Xã Tân Pheo	3	21	12	1,65	1,00	1,65	350,433,00	269,865,10	29,320,94	51,247,08	578.214,00	
28	Huyện Đà Bắc	Xã Tân Pheo	3	24	12	2,82	1,00	2,82	350,433,00	269,865,10	29,320,94	51,247,08	988.221,00	
29	Huyện Đà Bắc	Xã Tân Pheo	3	24	12	6,53	1,00	6,53	350,433,00	269,865,10	29,320,94	51,247,08	2.288.137,00	

Figure 3.39. Results presented to forest owners in group 2 according to the form of the Hoa Binh Fund

3.7. Editing PFES map layout on QGIS

3.7.1. Structure of PFES map layout

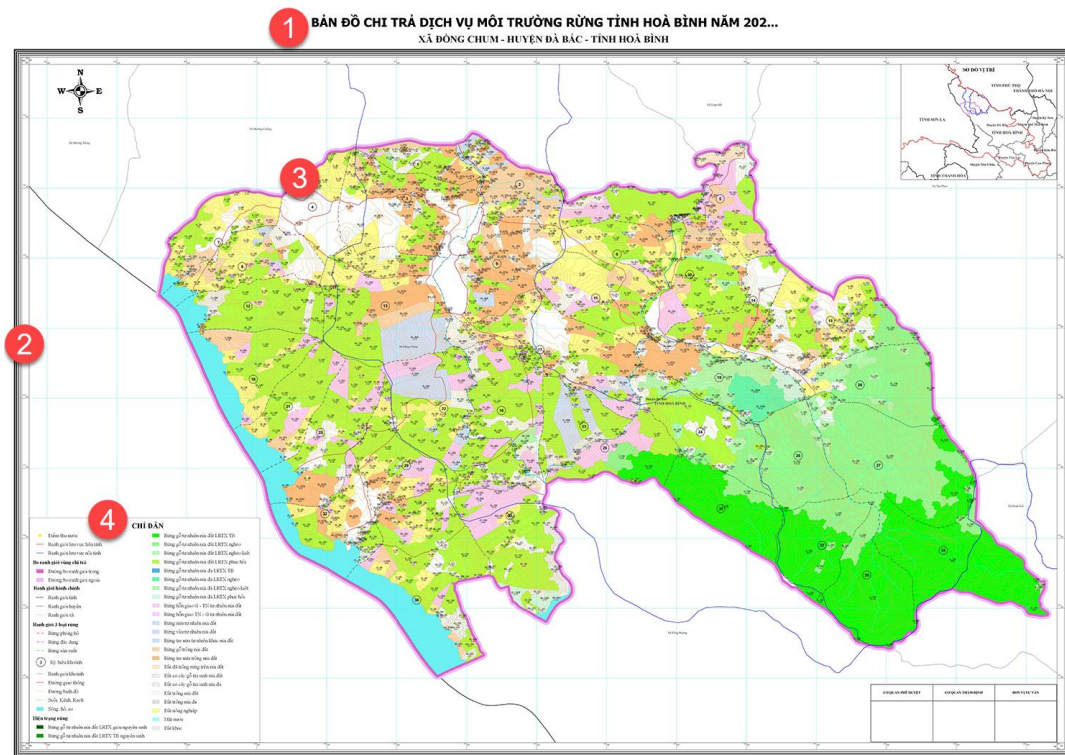
A completed PFES map is designed and edited, including the following information:

(1) **Title:** This is a general description of the map. The title is written in a simple, short and concise way but shows the main content of the map. Subheadings (usually smaller text just below the main headline) can be used to provide more detailed information about the map.

(2) **Coordinate grid:** Used to georeference, determine the location of any point on the map, and it will provide additional information about the map scale.

(3) **Main content:** The map layer of forest status for PFES is presented in accordance with the current regulations of the Ministry of Agriculture and Rural Development on editing forest status maps (stipulations on color, contour, number of plots, etc.).

(4) **Legend:** Can be placed inside or outside the frame of grid cells and is a detailed explanation of symbols (lines, points, characters, colors ...) on the map so that users can understand and identify the symbols quickly and accurately.



3.7.2. Requirement of input layers

3.7.2.1. The main map layers

The main map layers needed to edit the PFES map layout are defined as follows:

Id	Layers	Geometry type	Named rule	Style
1	Buffer layer	Line	*_buf	1 cm (trong 0,6 cm: Solid RGB (255, 144, 200); outside 0,4 cm: Solid (255,208,232))
2	Provincial boundaries	Line	*_rgtinh	According to TCVN 11565-2016
3	District boundaries	Line	*_rghuyen	According to TCVN 11565-2016
4	Commune boundaries	Line	*_rgxa	According to TCVN 11565-2016
5	Boundaries of 3 types of forests	Line	*_rg3lr	According to TCVN 11565-2016
6	Contour line	Line	*_dmuc	According to TCVN 11565-2016
7	Traffic road	Line	*_gthong	According to TCVN 11565-2016
8	Hydrology 1	Line	*_tv1	According to TCVN 11565-2016
9	Hydrology 2	Polygon	*_tv2	According to TCVN 11565-2016
10	Watershed boundary	Line	*_rglv	Simple, Solid line, RGB(0, 0, 255), Stroke: 0,5 mm
11	Point of interest	Point	*_dra	dot orange, size: 4
12	Forest status	Polygon	*_htr	According to TCVN 11565-2016

Notes:

* Abbreviated name of the basin/payment area; for hydroelectricity watershed write “TD_” + plant name; for water plant watershed, write “NMN_” + plant name; for ecotourism area write “DL_” + name of tourist area; for the spawning area, write “BD_” + the name of the spawning area; for carbon storage area write “CB_” + name of carbon storage area. For example: TD_HoaBinh; NMN_VINACONEX.

The administrative names shown on the map are specified as follows:

- COUNTRY NAME: Font Arial, Bold, 16, Black, Upper Case
- PROVINCIAL NAME: Font Time New Roman, Bold, 16, Black, Upper Case
- District Name: Font Time New Roman, Bold, 14, Black, Capitalize the first letter of each word

- Commune Name: Font Time New Roman, 12, Black, Capitalize the first letter of each word
- MAP TITLE: Font: Tahoma, Size: 42, Bold, Black
- MAP SUB TITLE: Font: Tahoma, Size: 36, Bold, Black (*sub title size is about 80-85% of main title size*)

For example:

MAP OF PAYING FOR FOREST ENVIRONMENT SERVICES IN 2022
DA BAC DISTRICT - HOA BINH PROVINCE

Grid:

- Title under the frame: Font .vnTime, Size 12, Normal, Italic, Black
- Bottom left: Input data source (eg: Forest status map layer according to forest change monitoring results in 2021 and field review results in 2022)
- Bottom right:
 - + Executing unit: *Name of the implementing unit*
 - + Completed: month....year 202...

3.7.2.2. Location map layers

The map showing the location of the watershed should have the following layers of information:

Id	Layers	Geometry type	Named rule	Style
1	Administrative boundaries	Line	*_rghc	Simple Solid, stroke: 0,36 mm, màu RGB (35,35,35)
2	Watershed boundary	Polygon	*_lvpol	Simple fill, Solid RGB (255,0,0)

3.7.2.3. Legend

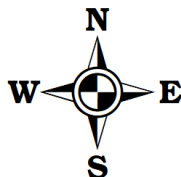
Instructions for displaying line styles, area styles, and point styles presented in the main layers as thumbnails and explaining each layer.

Letters LEGENT: font: Arial, Bold, 18, Black.

Font in the symbol explanation: Arial, Normal, 14, Black.

3.7.2.4. Nort arrow

Using the arrow symbol to indicate the North direction shows 4 components: East, West, South, North. For example:



3.7.2.5. Legal information

The legal frame shows the signature box of the construction unit, the appraisal unit, the approving unit (depending on the requirements of each locality). The frame is designed as a solid line, in black, with a stroke of 0.26 mm and with a white background.

The text in the legal frame has font Time New Roman, size 13, RGB color (0,0,0), centered. For example:

THE APPROVING UNIT	THE APPRAISAL UNIT	THE CONSTRUCTION UNIT

3.7.2.6. Statistical table of payment area by administrative unit

The statistical table of the payment area (converted) by administrative unit of the province, district, commune (or at the request of the locality) is as follows:

TT	Administrative units	Area	Payment area
	Total:		
I	District A		
1	Commune 1		
2	Commune 2		
II	District B		
1	Commune 1		
2	Commune 2		

3.7.3. Requirements on the scale of PFES map

The scale of the PFES map is specified as follows:

a. For maps by administrative level, the regulations are as follows:

- Commune map: from 1/25.000 - 1/5.000;
- District map: from 1/50.000 - 1/25.000;
- Provincial map: from 1/100.000;

b. For the map by watershed, the specific scale is defined as follows:

- A watershed with an area of less than 10,000 hectares: the map scale is 1/10.000 or 1/5.000.

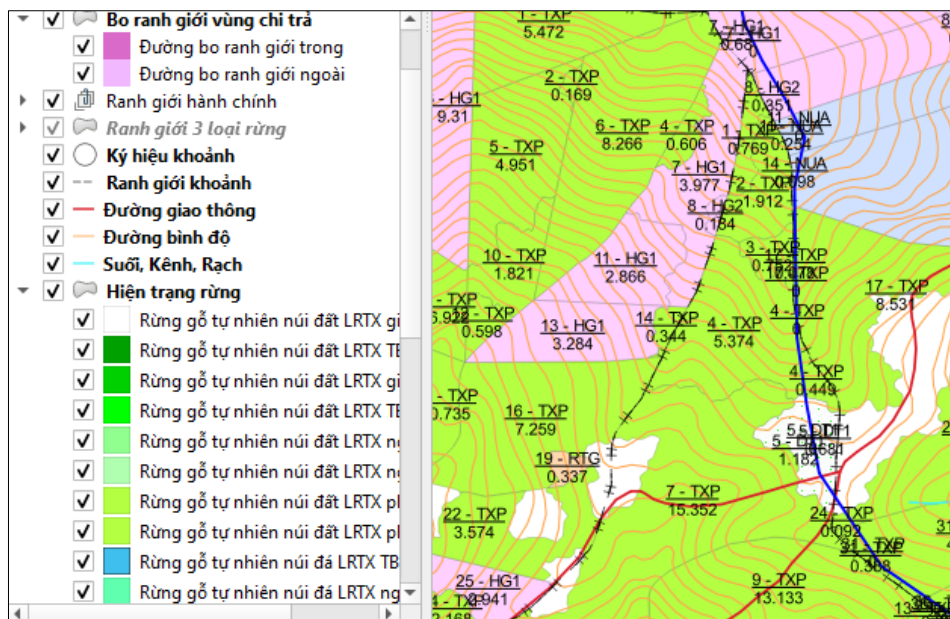
- The watershed has an area from 10,000 ha to 100,000 ha: the map scale is 1/25.000.

- The watershed has an area of over 100,000 ha to 500,000 ha: the map scale is 1/50.000.

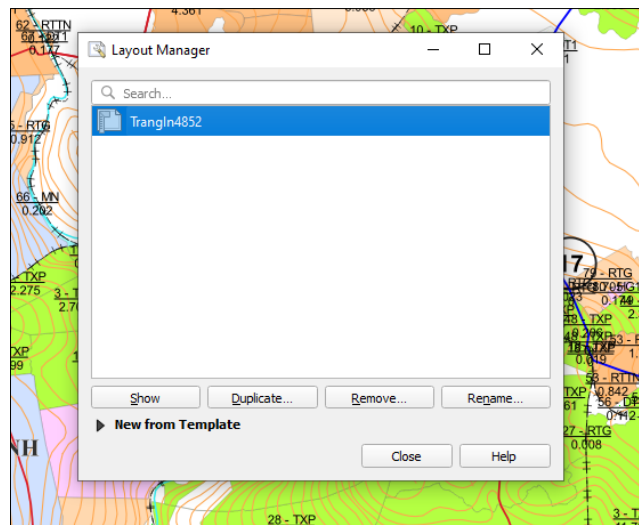
c. The watershed covers an area of more than 500,000 hectares: the map scale is 1/100.000

3.7.4. Steps to edit maps layout on QGIS

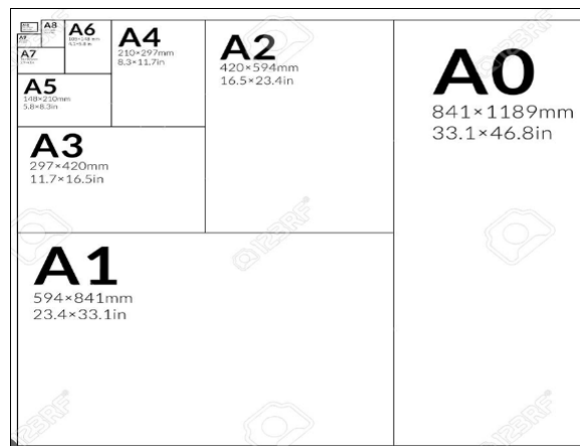
Step 1: Open the input map layers on QGIS and set the styles as specified in section 3.7.2.



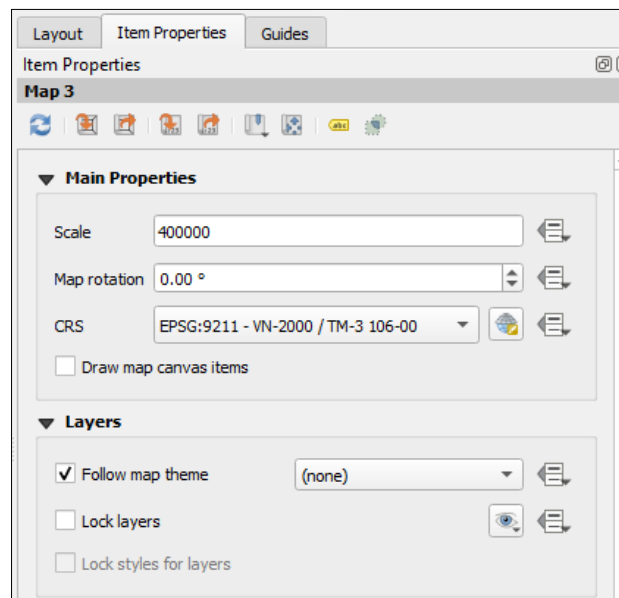
Step 2: Open the print layout manager and create a new print layout.



Step 3: Set the page size for the print layout.

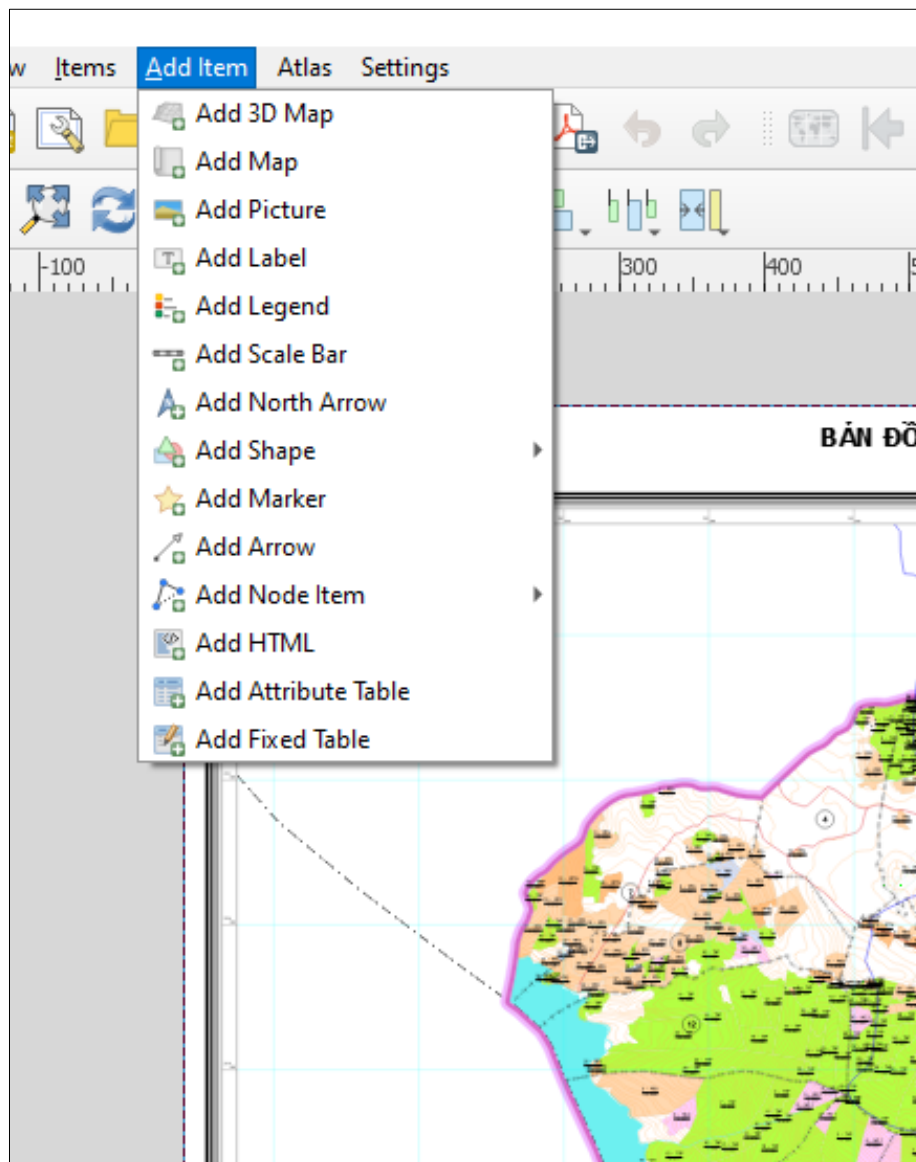


Step 4: Add maps to the layout and select the appropriate scale.

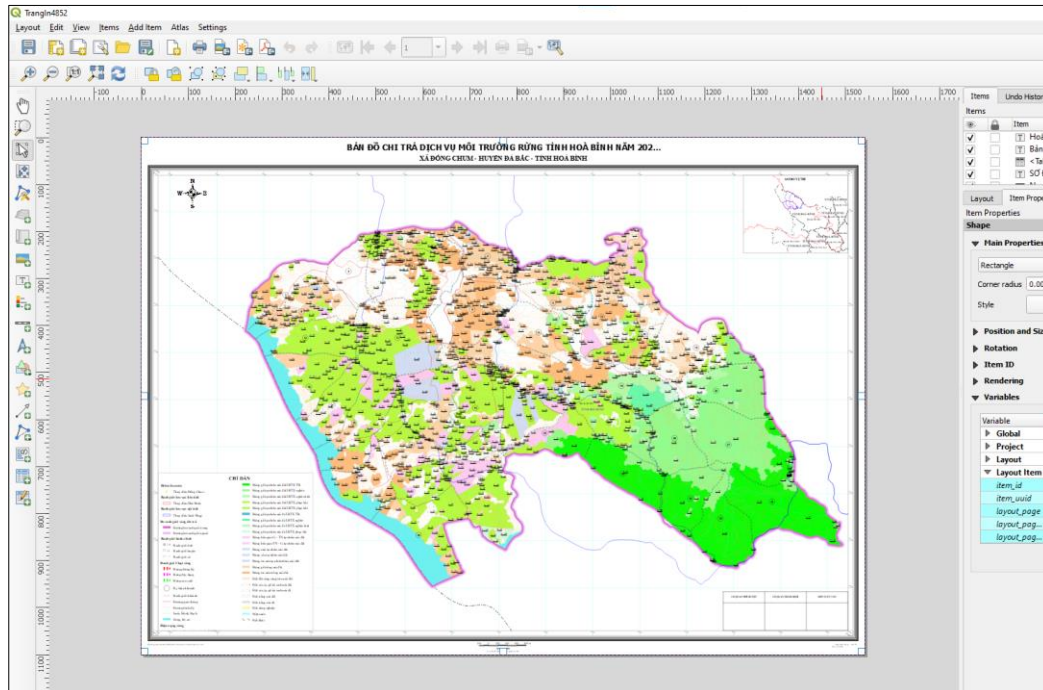


Step 5: Adding other elements to the print layout:

- Location map frame.
- Title, sub title, input data source information, copyright information, construction unit information, year of completion.
- North arrow.
- Legal information frame.
- Legend.
- Summary table of payment information.
- Scale bar.

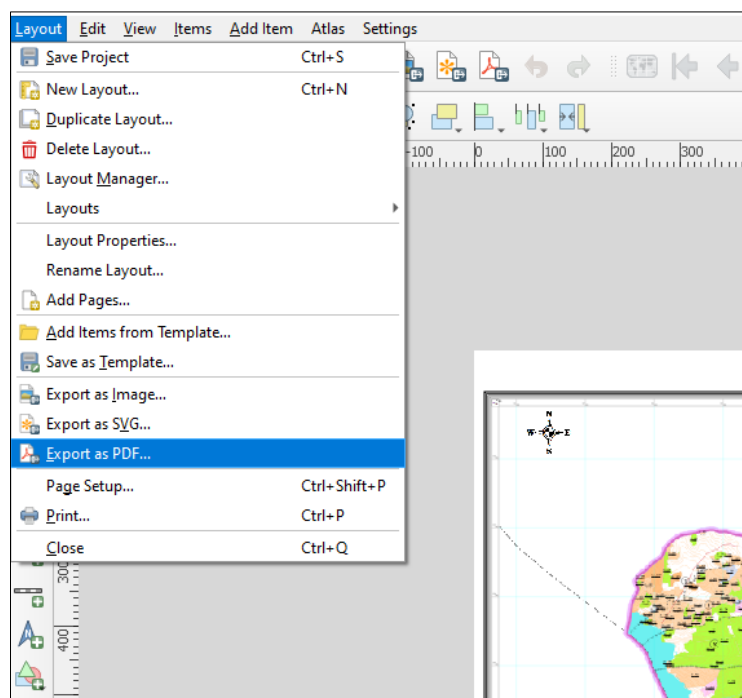


Step 6: Align the print layout: arrange the elements on the print layout so that it is appropriate, easy to see and aesthetically pleasing.



Step 7: Save print layout:

- Save as QGIS Project
- Export as PDF
- Export as PNG/TIFF/JPEG



3.8. Print layout on Q5PFES

3.8.1. Developing a print layout of PFES map

The final results of the PFES map layer will be imported into the plugin's database to develop the complete print layout for the PFES map.

Input data: The complete PFES map layer that has been completed from procedure 3.4 to procedure 3.7 or a specific map layer of each province.

The procedure is as follows:

Procedure 3.10. Developing a print layout of PFES map

1. . From the Q5PFES Plugin, select “Print layout/Developing the print layout”
2. . Select input map layer.
3. Click “OK”.

Apply procedure 3.10 to develop the complete print layout for the PFES map according to the following steps:

Step 1: Start the Developing print layout module.

From the menu bar > Q5PFES > Print layout> Developing a print layout.

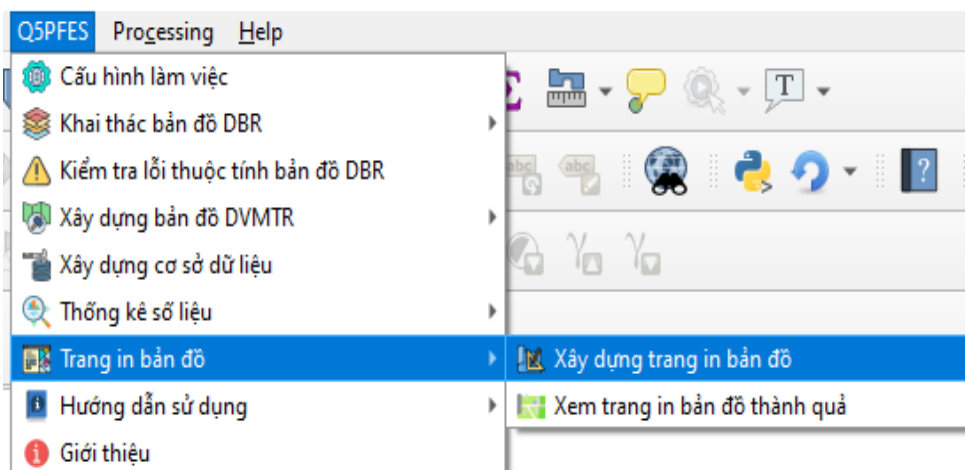


Figure 3.40. Start the Print layout module

Step 2: Select input map layer.

Select the input map layer as the complete PFES map developed from the previous steps.

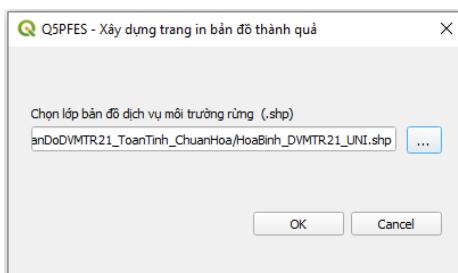


Figure 3.41. Developing the print layout interface

Step 3: Click “OK”.

After clicking “OK”, wait for the program to work until the successful message appears.

3.8.2. Show the PFES map print layout

After developed the PFES map print layout, the plugin is ready to show print layout of the resulting maps according to administrative levels of the province, district and commune to serve the extraction and printing of complete PFES maps.

The procedure is as follows:

Procedure 3.11. Show the PFES map print layout

1. From the Q5PFES Plugin, select “Print layout/Show the PFES map print layout”
2. Select administrative level.
3. Click “OK”.

Apply procedure 3.11 to show the PFES map print layout according to the following steps:

Step 1: Start the Show print layout module.

From the menu bar > Q5PFES > Print layout> Show layout.

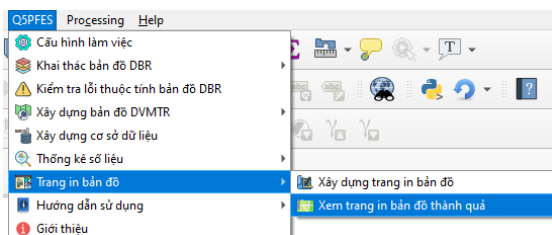


Figure 3.42. Start the print layout module

Bước 2: Select administrative level.

Select location by administrative level to show the map print layout.

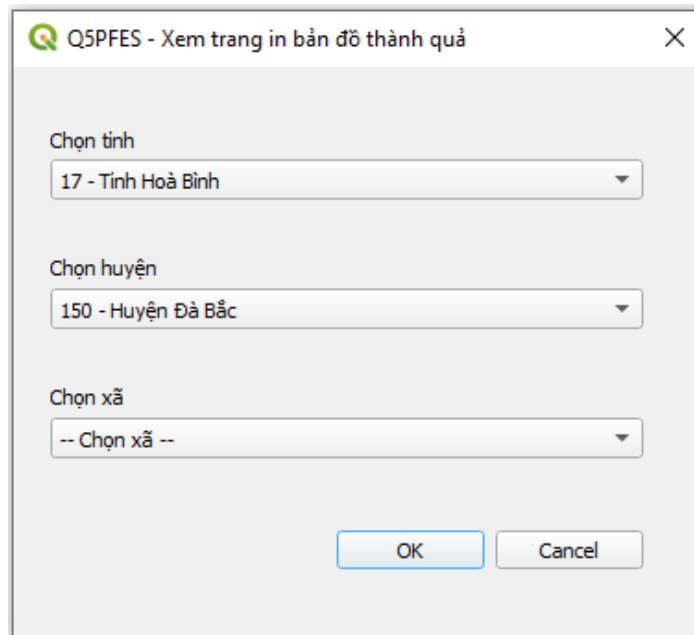
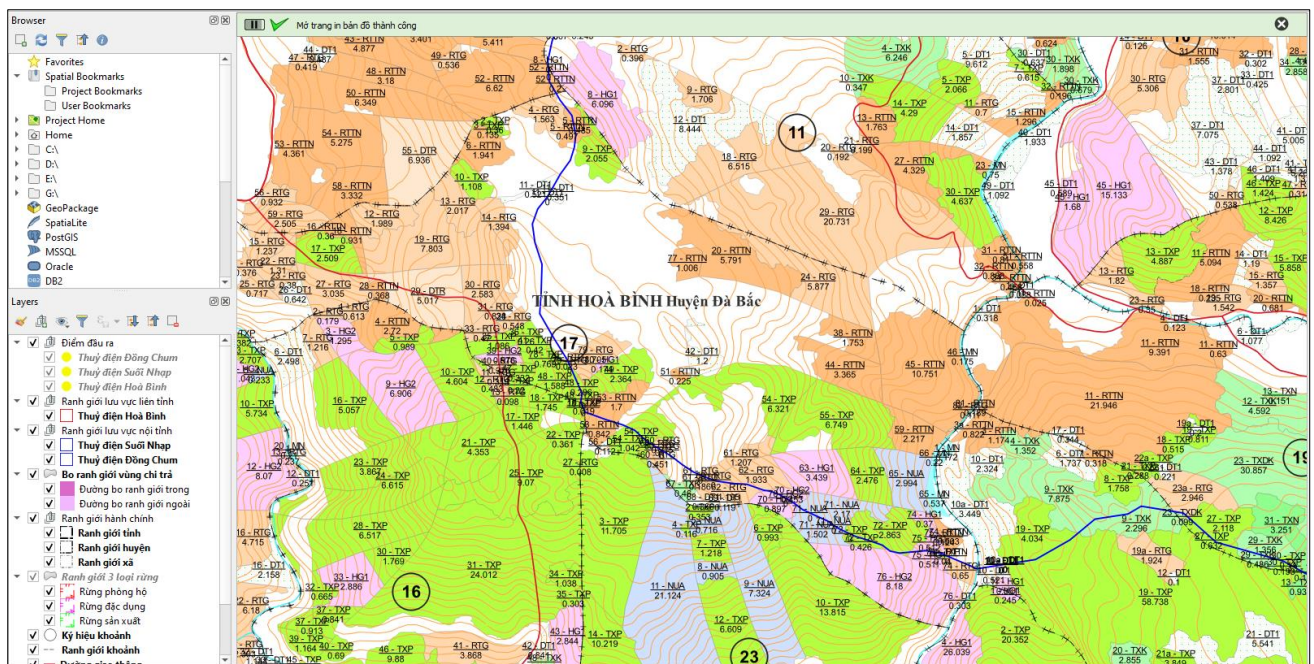


Figure 3.43. Select administrative level

Bước 3: Click "OK".

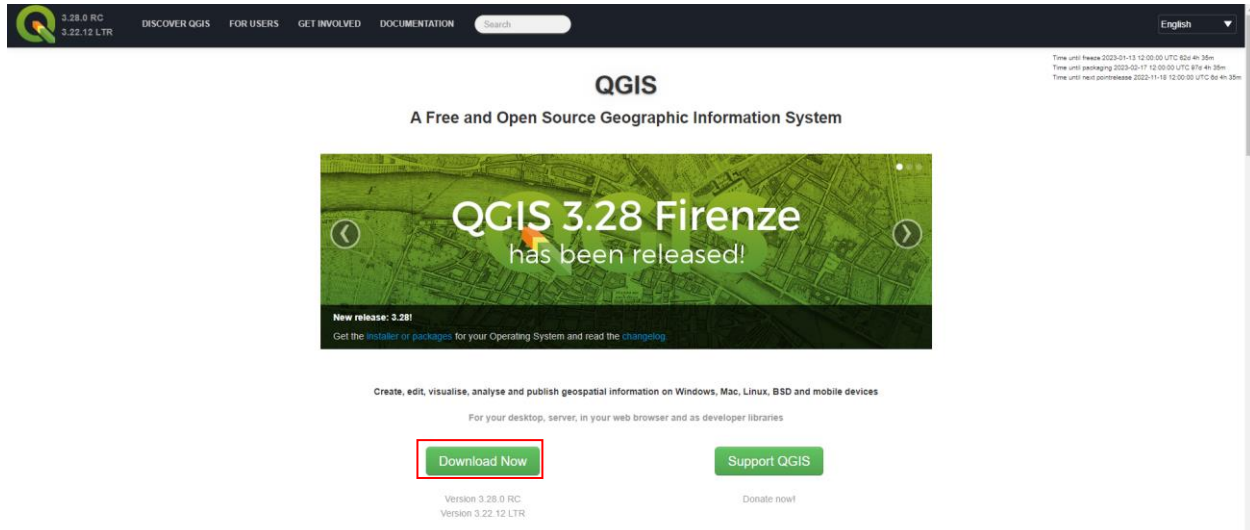
After clicking "OK", wait for the program to work until the map print layout appears on the QGIS window.



Hình 3.44. Results map print layout window

Appendix 1. Instructions for installing QGIS software

Visit Website: <https://qgis.org/en/site/>. Scroll down the middle of the page, click the “Download” button.



Next, choose the version suitable for your computer, it is recommended to choose the version of QGIS 3.16 because this version has been tested for a while by users, so it is the most stable version. To select this version, select the “ALL RELEASES” tab and then click “here” in the first line.

Download QGIS for your platform

Binary packages (installers) are available from this page.

The current version is QGIS 3.28.0 'Firenze' and was released on 21.10.2022.

The long-term repositories currently offer QGIS 3.22.12 'Białowieża'.

QGIS is available on Windows, macOS, Linux, Android and iOS.

[INSTALLATION DOWNLOADS](#) [ALL RELEASES](#) [SOURCES](#)

Previous releases of QGIS are still available [here](#) - including older releases for OS X [here](#).

More older releases are available [here](#) [↗] and for OS X [here](#) [↗].

Plugins for QGIS are also available [here](#) [↗].

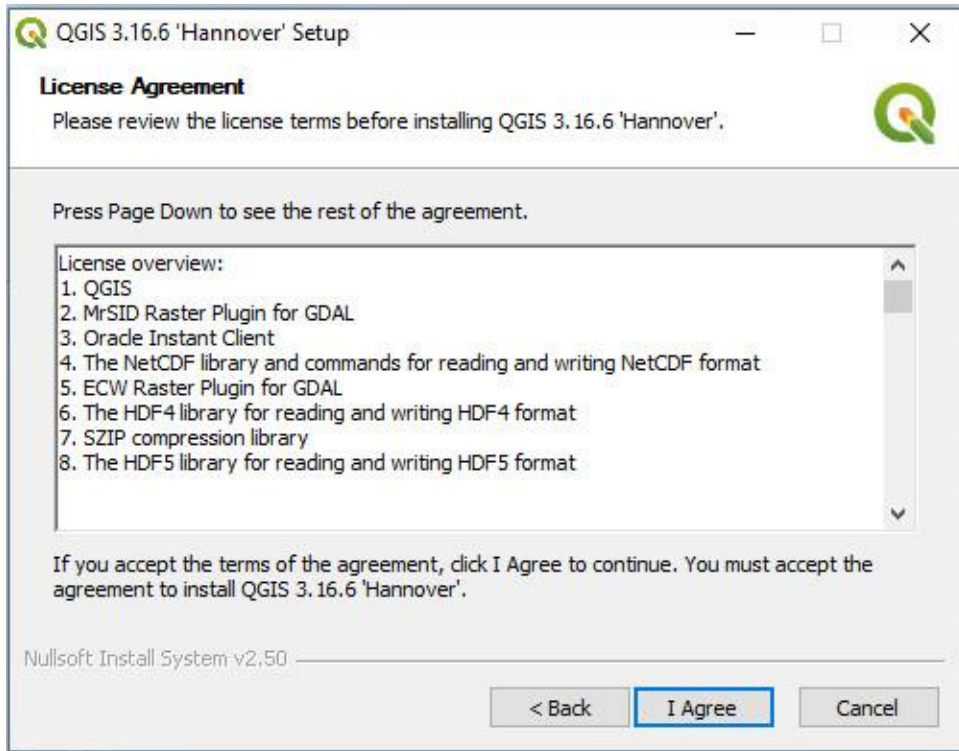
A complete list of all versions of the QGIS software so far is displayed. Scroll down and find QGIS version 3.16.6-1 and then double click on the link [QGIS-OSGeo4W-3.16.6-1-Setup-x86_64.exe](#) to download the software.

	QGIS-OSGeo4W-3.16.4-1-Setup-x86.exe.sha256sum	2021-02-22 04:14	102
	QGIS-OSGeo4W-3.16.4-1-Setup-x86_64.exe	2021-02-23 12:22	390M
	QGIS-OSGeo4W-3.16.4-1-Setup-x86_64.exe.sha256sum	2021-02-22 04:24	105
	QGIS-OSGeo4W-3.16.5-1-Setup-x86.exe	2021-03-20 07:22	338M
	QGIS-OSGeo4W-3.16.5-1-Setup-x86.exe.sha256sum	2021-03-20 07:22	102
	QGIS-OSGeo4W-3.16.5-1-Setup-x86_64.exe	2021-03-20 07:32	390M
	QGIS-OSGeo4W-3.16.5-1-Setup-x86_64.exe.sha256sum	2021-03-20 07:32	105
	QGIS-OSGeo4W-3.16.5-2.msi	2021-03-21 22:53	1.1G
	QGIS-OSGeo4W-3.16.5-2.sha256sum	2021-03-21 22:53	92
	QGIS-OSGeo4W-3.16.5-3.msi	2021-03-30 12:50	1.1G
	QGIS-OSGeo4W-3.16.5-3.sha256sum	2021-03-30 12:50	92
	QGIS-OSGeo4W-3.16.6-1-Setup-x86.exe	2021-04-17 13:28	339M
	QGIS-OSGeo4W-3.16.6-1-Setup-x86.exe.sha256sum	2021-04-17 13:28	102
	QGIS-OSGeo4W-3.16.6-1-Setup-x86_64.exe	2021-04-17 13:38	390M
	QGIS-OSGeo4W-3.16.6-1-Setup-x86_64.exe.sha256sum	2021-04-17 13:38	105
	QGIS-OSGeo4W-3.16.7-1-Setup-x86.exe	2021-05-15 14:22	339M
	QGIS-OSGeo4W-3.16.7-1-Setup-x86.exe.sha256sum	2021-05-15 14:22	102
	QGIS-OSGeo4W-3.16.7-1-Setup-x86_64.exe	2021-05-15 14:32	390M
	QGIS-OSGeo4W-3.16.7-1-Setup-x86_64.exe.sha256sum	2021-05-15 14:32	105

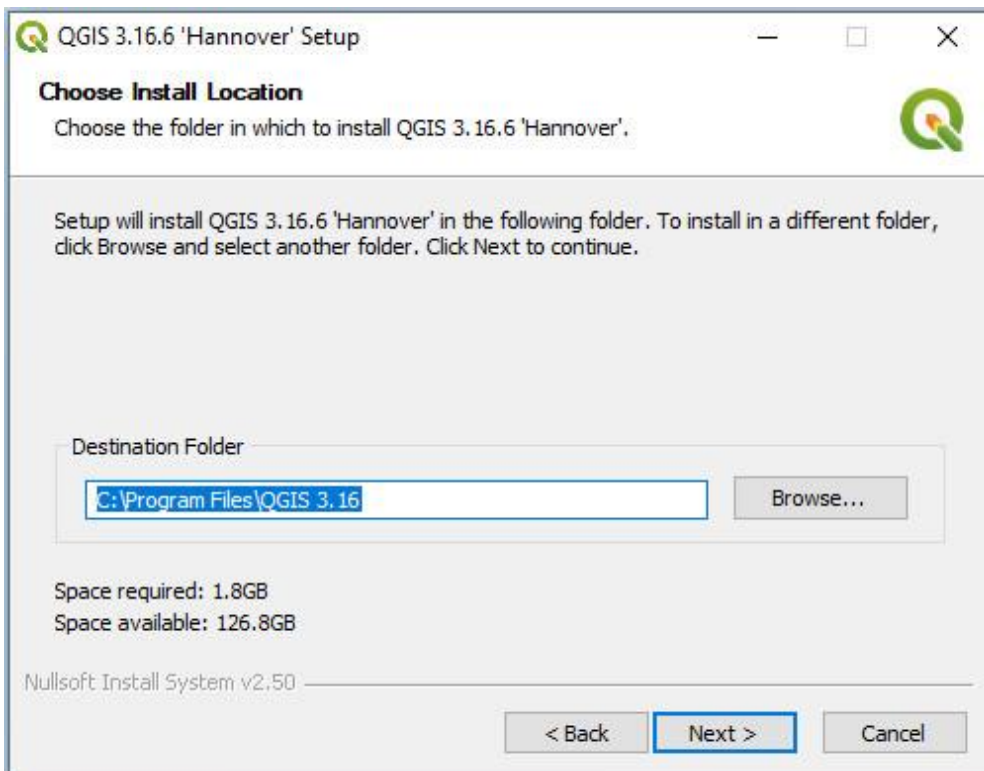
After downloading, double-click the downloaded file to start the installation process. In the pop-up window, select next.



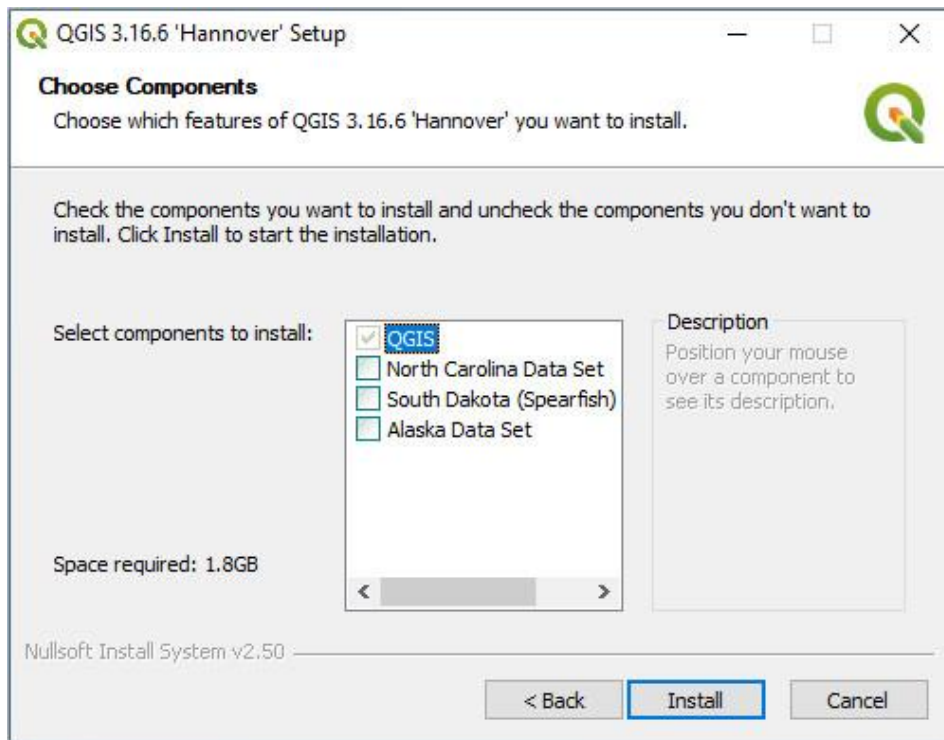
Select “I Agree” to accept the terms of use.



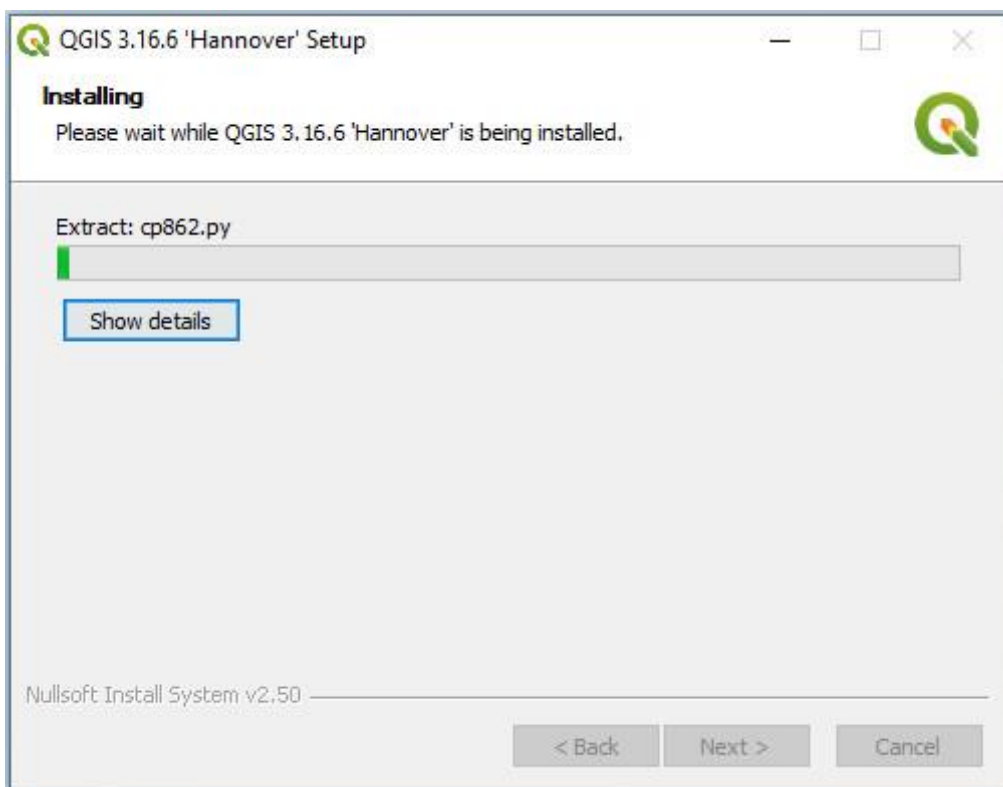
Select the installation path, user can default of the software.



Uncheck the 3 boxes below in the next window and select Install.








The installation process can take up to a few minutes, depending on your computer configuration.



Finally, select Finish to finish the installation.



On the desktop, users will see a folder containing the paths of the software. Double click on the path named “QGIS Desktop”

 OSGeo4W Shell	11/12/2022 3:04 PM	Shortcut	2 KB
 QGIS Desktop 3.16.6 with GRASS 7.8.5	11/12/2022 3:04 PM	Shortcut	2 KB
 QGIS Desktop 3.16.6	11/12/2022 3:04 PM	Shortcut	2 KB
 Qt Designer with QGIS 3.16.6 custom wid...	11/12/2022 3:04 PM	Shortcut	3 KB
 SAGA GIS (2.3.2)	11/12/2022 3:04 PM	Shortcut	3 KB

SAGA GIS (2.3.2)

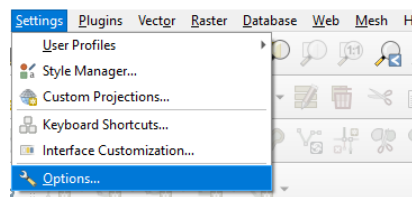
Appendix 2. Instructions for setting up the initial modes on QGIS software

1. Geometry error ignoring mode

To avoid map geometries errors when using the Q5PFES plugin. We need to set up geometry error ignoring mode on QGIS.

From the QGIS software interface, navigate to Settings tab.

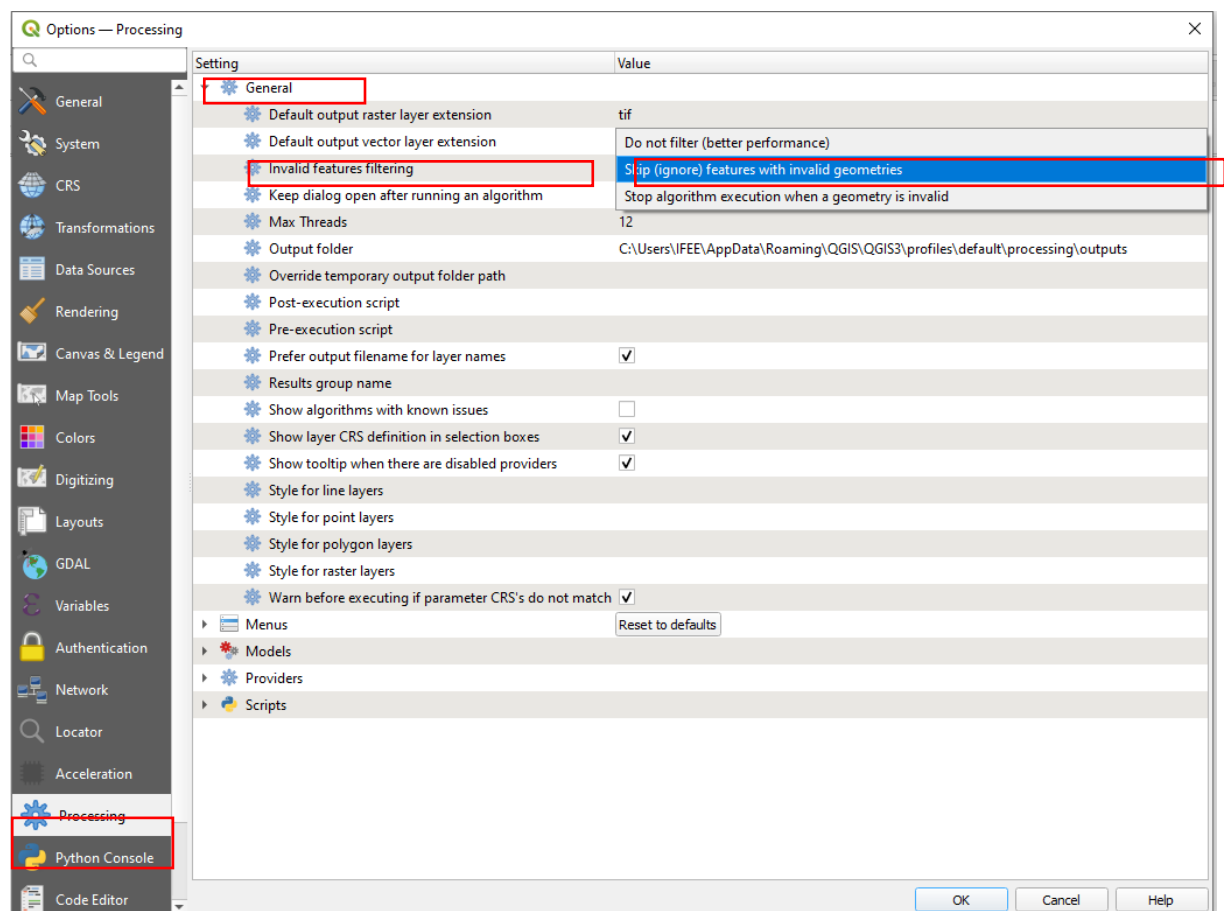
Select Settings > Options...



The Options window opens. Select "Processing".

Click on the "General" section and then find the "Invalid features filtering" section and then click on "Skip (ignore) features with invalid geometries".

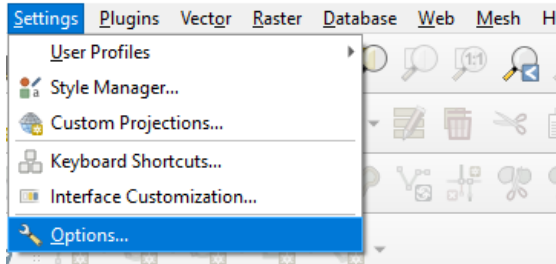
Finally, click "OK".



2. Language setting

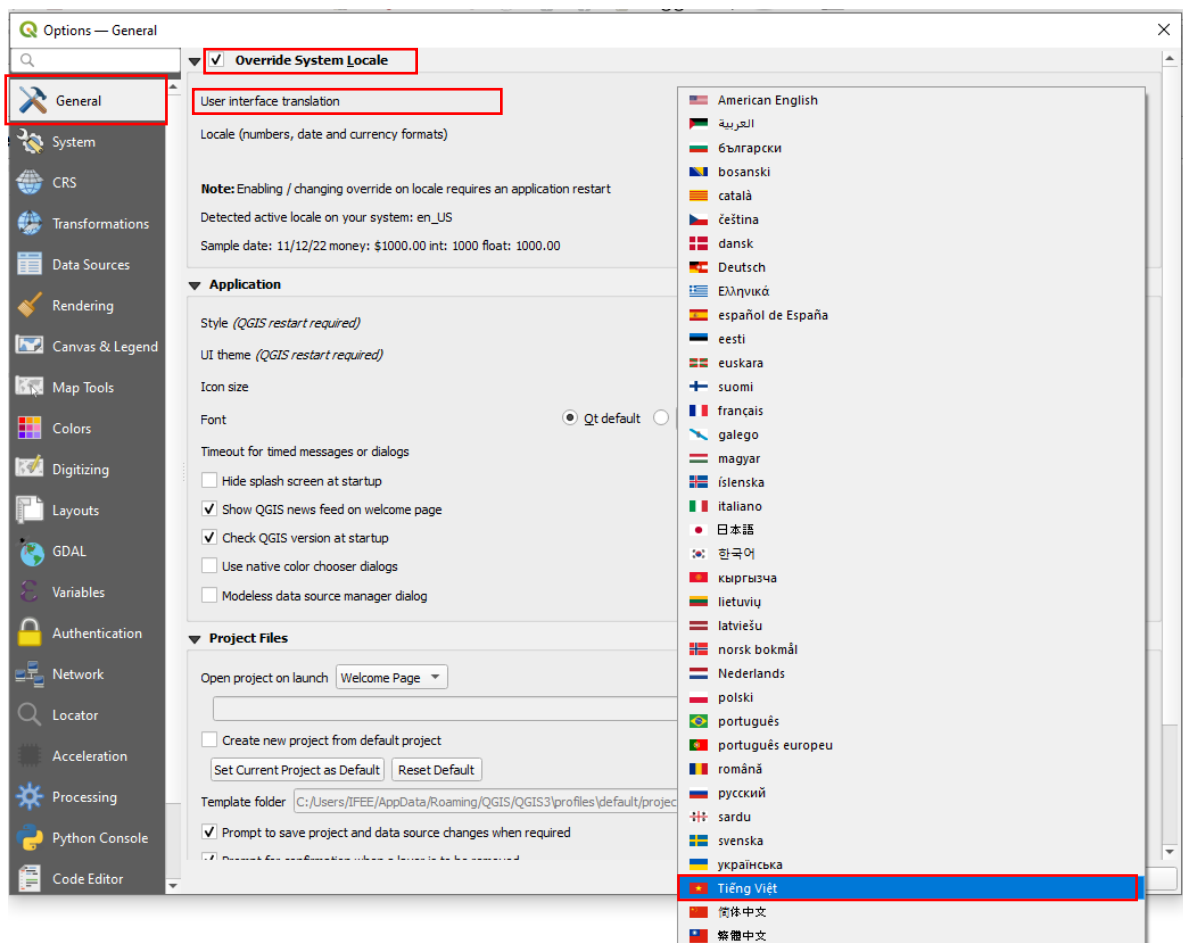
From the QGIS software interface, navigate to Settings tab.

Select Settings > Options...



The Options window opens. Select "General".

Check the box "Override System Locale" and then select the language by clicking the drop-down language option box in the "User interface translation" section.

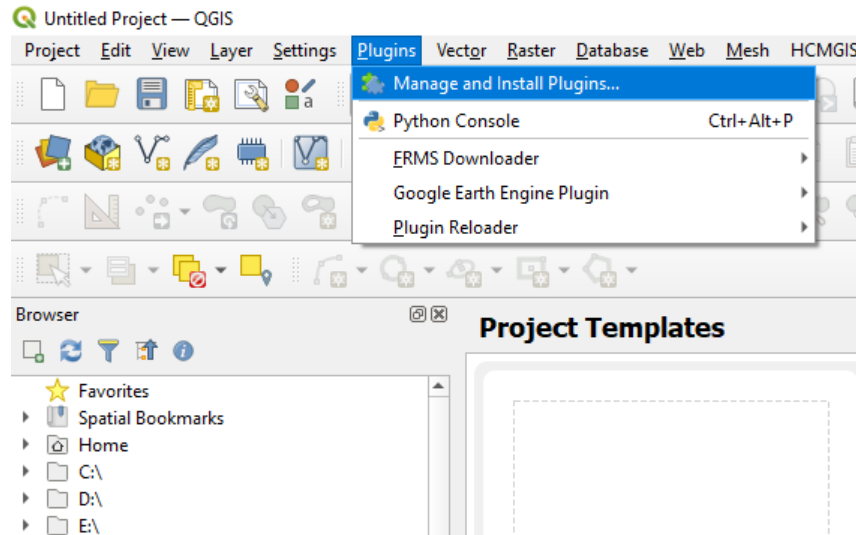


Finally, click "OK"

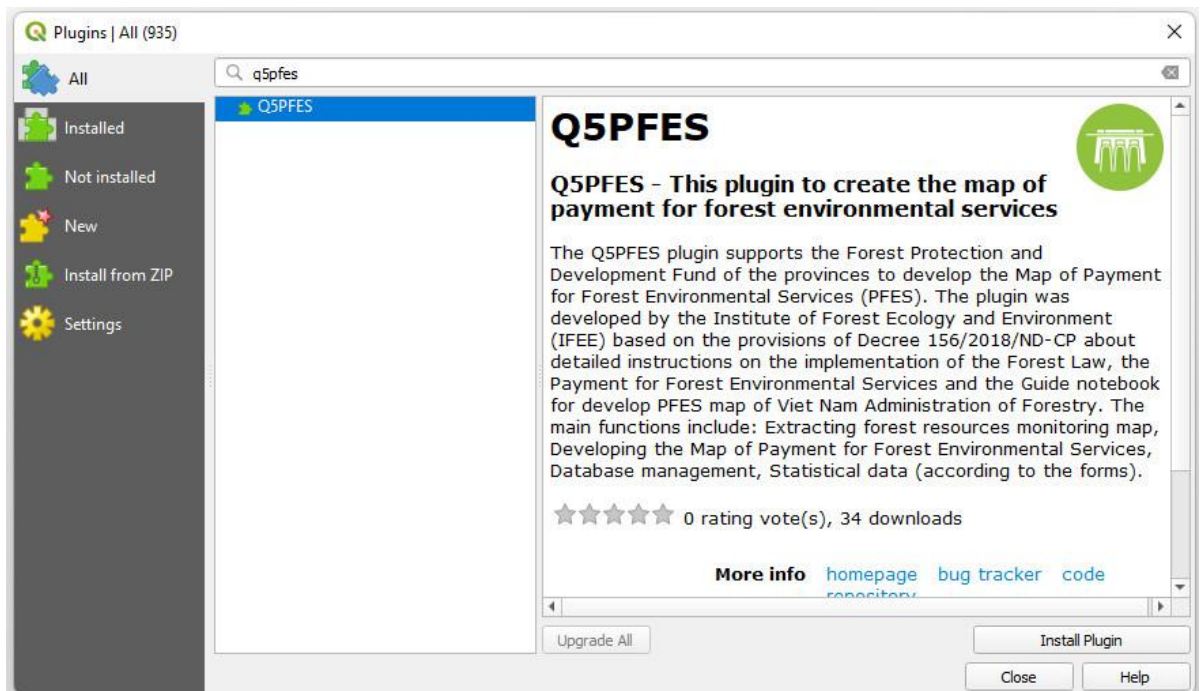
Appendix 3. Instructions for installing Q5PFES plugin on QGIS software

From the Qgis software interface, navigate to the Plugins tab.

Click Plugin > Manage and Install Plugins...



The Plugins window opens. Select "All".



In the search bar, enter the keyword “Q5PFES” then select the plugin Q5PFES.

Click “Install Plugin” to install the plugin.

After the plugin is installed, it will display as a tab on the main menu bar of the software.

