

# Forest land consolidation of community forests in North Rhine-Westphalia

## Readjustment of property as a solution for land fragmentation and inactive small-scale private forest owners in Germany

### SIMWOOD Pilot Project NRW Summary Report

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## *Citation and Abstract*

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The SIMWOOD pilot project in NRW demonstrates how forest land consolidations can enhance the land ownership structure of small-scale private forests and reactivate the forest use. Based on the unique legal framework of the Community Forest Act GWG of NRW, this special consolidation achieves a legal merger of community forests and private owners into a larger forest cooperative society, which goes beyond the readjustment of land parcels per single landowner. The degree of the merger and the benefits for collaborative SFM are thus enhanced compared to conventional land consolidations. Various supporting measures, such as road constructions, silvicultural improvements or landscape interventions are included to generate additional sustainable impacts in the region.

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# 1 Small-scale private forest owners: a main target group for wood mobilisation

## 1.1 Background

The increasing **fragmentation** of privately-owned forest land represents a main challenge for the future supply of wood raw material in the forest-based sector. In Germany exist at least 2 million private forest owners, which of a majority owns only 1 ha of land or even less. Furthermore, more and more private forest owners with urban lifestyles have abandoned the management of their forest. These forests can hardly be managed productively, which is why, owing to these structural barriers, they are accumulating large unused timber resources that are not accessible for the market.

Research and practitioners are looking for new solutions of joint forest management and ways to activate **small-scale private forest owners**. Especially forms of joint ownership, in which the property is not linked to single land parcels, but is instead divided as ideal shares among the owners, raise large interest. Based on this principle, community forests have existed for centuries and have survived in many regions until today. Second, there is a growing interest in **forest land consolidations (FLC)** as a suitable instrument to overcome the small-scale structural barriers in private forests. Such land readjustments require quite long procedures, but they lead to decisive improvements and valorisation of the property, and to an activation of forest use with many positive regional effects.

In the model region North Rhine-Westphalia (NRW), community forests are an important forest ownership type. The original community forests were based on century-old laws, which were all unified and redefined as **forest cooperative societies (FCS)** in the *Community Forest Act GWG* of 1975. Today there exist 270 FCS with circa 42,000 ha and an estimated 17,500 forest owners as shareholders. A specific aspect of the NRW GWG is that it permits a special procedure, based partly on the land consolidation act, to merge several FCS into a new, larger FCS to improve the conditions for forestry and administration. The specificity is that with one procedure not only a readjustment of land property, but also a **merger of ownership** is achieved. Such a combined procedure can enhance the degree and effect of the FLC even more compared to a conventional consolidation, which does not reduce the number of forest owners significantly.

## 1.2 Main objective

The main objective of the NRW pilot project is to **evaluate the instrument of FLC of FCS** in view of its possibilities for the activation of small-scale private forest owners and wood mobilisation. Results and lessons learnt from selected best practice cases in NRW and Hesse are summarized and made accessible for broader national and international dissemination.

## 1.3 Keywords - target group, critical barriers

*Target groups:* Small-scale private forest owners, inactive owners, foresters, planners, advisors.  
*FLC/FCS solution:* unmanaged forest / inactive forest owners; non-organised forest owners; economically unviable forest property; fragmentation of forest property; unknown forest parcel borders; outdated or imprecise cadastral info; insufficient forest access; steep forest terrain

## 1.4 Theory of change

Mobilising small-scale private forest owners is a declared priority of the NRW State Forest Enterprise. The model of FCS in conjunction with FLC is a relevant potential solution to overcome structural barriers for viable management and timber marketing of fragmented small-scale forest property in NRW and beyond. The main bottleneck for wider acceptance and application of the concept is the reluctance of private forest owners to join and commit to such cooperative initiatives.

The purpose of the NRW pilot project was to collate and evaluate the state of knowledge of this complex, but clearly effective integrated wood mobilisation solution and make it more accessible to the target group. The objective evaluation of a number of successful cases provides convincing, tangible evidence on the solution’s benefits for individual owners and wider impacts for SFM. Well-documented best practice stories, cost-benefit results and lessons learnt will be tested and improved with representatives of the target group.

The evaluation adds valuable findings to national and international research, which promote FLC and FCS as a key solution to activate small-scale private forest owners. Through wider national dissemination in the forestry community of Germany and other European member states, the concept can be exploited further and ultimately induce additional mobilisation of private forest owners also in other regional settings.

## 2 Forest Land Consolidation as an instrument to overcome fragmentation: review of best practices in NRW, Germany

### 2.1 Forest cooperative societies (FCS) in NRW

A FCS (in German: *Waldgenossenschaft*) is a type of joint private forest ownership, which is generally termed *community forest*. They have existed in Europe already for centuries in manifold traditional forms, some of which exist until today. The main characteristic compared to other forms of forest ownership is that the owners do not own a particular land parcel of a forest area, but an ideal share of the whole cooperative property, which can be understood as a share of a stock market (Figure 1).

The **Community Forest Act (GWG, in German: *Gemeinschaftswaldgesetz*)<sup>1</sup>** of 1975 in NRW converted the original, quite heterogeneous forms of community forests into FCS according to the law, which have the legal status of a public body by law. Thus the FCS are an own legal entity and are enabled to act on behalf of a majority vote. However, the property is still considered as private forest, which is also stated explicitly in the law. Because of the binding criteria in the GWG, it can be understood as “bound private forest” with a closed community of owners. The FCS has solely the function to manage and administrate the community assets, but it is not their owner.

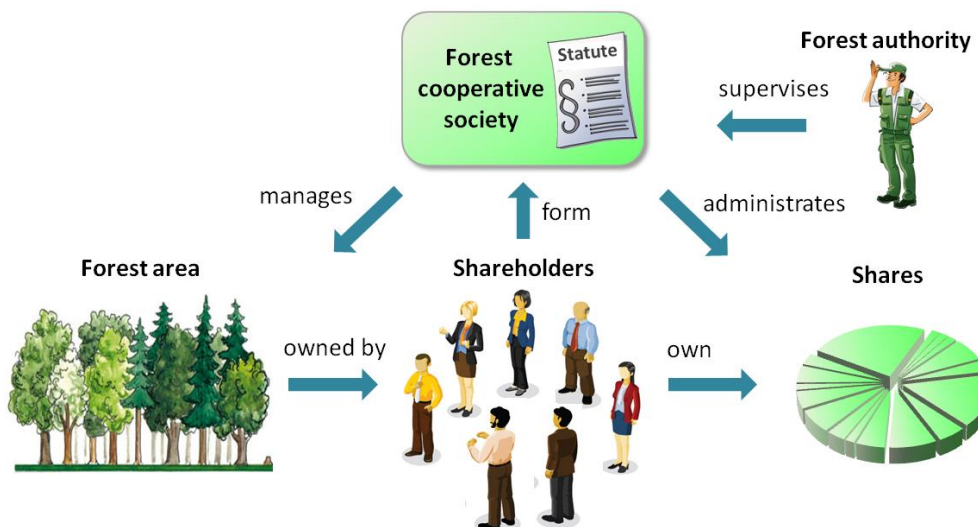


Figure 1 Legal status of a FCS according to the NRW GWG (adapted from Ewers 2015)

<sup>1</sup> MIK NRW Ministerium für Inneres und Kommunales des Landes NRW, 1975. Gesetz über den Gemeinschaftswald im Land Nordrhein-Westfalen – Gemeinschaftswaldgesetz – 8.4.1975 (GWG)

## 2.2 Legal basis and function of FLC

Land consolidation is an instrument of sectoral land readjustment to improve the structural situation of land property in agriculture and forestry. It is implemented by a responsible planning administration through a regulated consolidation procedure in close cooperation with local actors. According to the German **Land Consolidation Act (FlurbG)**, not only agricultural property, but also forest property can be readjusted to improve the production and working conditions and to support general culture and land development. The main goal is to improve efficiency and competitiveness of forest enterprises. This is mainly achieved through measures of realignment of fragmented or uneconomically formed property. By means of an exact mapping and thoroughly planned consolidation of dispersed land parcels, the fragmentation is 'dissolved' and an optimized, legal consolidation of the property is obtained including a change of the land register (Figure 2).

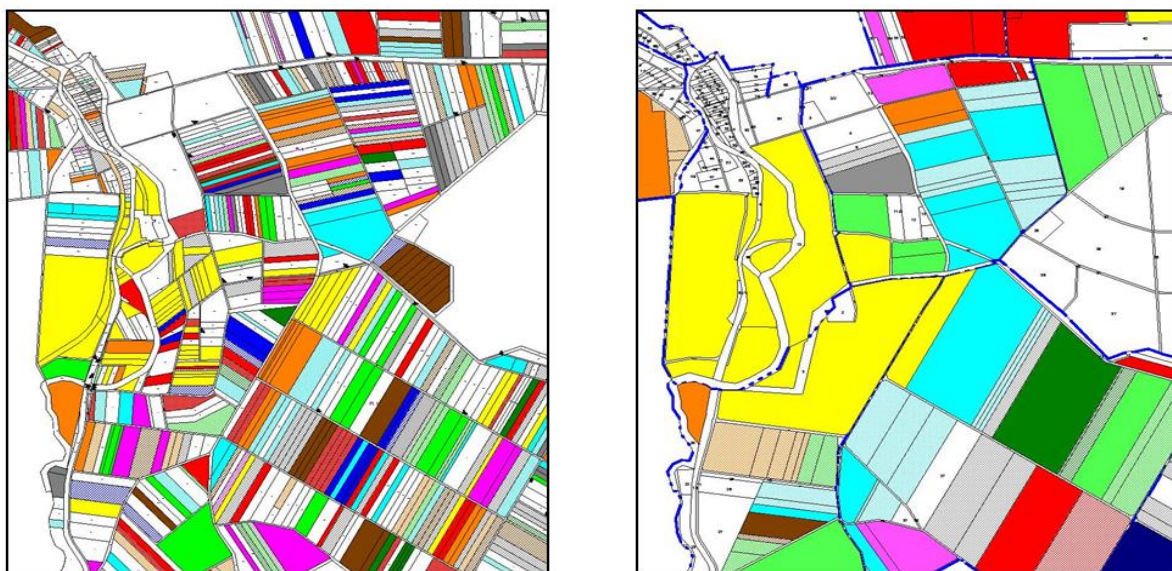


Figure 2 Map example of a land consolidation improving the ownership structure

The FLC according to the GWG represent a special type of procedures. Their purpose is to merge several FCS and communities of joint owners into a new FCS. Beyond the main goal of parcel realignment, the further possibilities of the Land Consolidation Act FlurbG can be exploited during a procedure, which is of major importance in practice. Hence also measures for forest road construction, landscape development, voluntary parcel exchange, border regulation and other measures can be integrated into a GWG procedure in a synergetic manner.

## 2.3 Steps of a FLC procedure of community forest according to the GWG

The important aspect of NRW's GWG is that it allows the consolidation of several FCS into a new, larger FCS (Peter 2012, Ahlborn 2015). The specificity is that not only a readjustment of land property, but also a **merger of ownership** is being achieved within one procedure. This means that in contrast to a conventional FCS according to FlurbG, several legal owners (FCS) and potentially further private owners are *united legally*. Such a combined procedure can enhance the degree and effect of the FLC even more compared to a conventional FlurbG consolidation, which essentially reduces only the number of land parcels, but not the number of forest owners. This advantage shall be demonstrated in this study with the help of the selected cases as examples.



FLC procedures according to GWG follow a sequence of six main legal steps for the consolidation of several FCS in relation with the FlurbG. After completion of the procedure, a new FCS is founded.

1. **Initiation of the procedure:** The participants are the community of joint owners of the FCS. A public information event about the intended FLC is carried out to present and explain the specific objectives of the procedure. An assembly of participants is formed and a representative board is elected, which represents the participants' joint interests during the procedure. The consolidation can only be initiated by a joint official request of the participants addressed to the responsible forest administration and consolidation authority.
2. **Valuation procedure:** The purpose of the valuation is to assess the total value of the community of joint owners following official guidelines. For the soil valuation, usually only one forest soil class and average soil value is defined for the whole procedure. For the forest valuation (valuation of timber stock), all forest areas of the FCS and possibly other participants have to be assessed individually for their value, following the relevant guidelines of the FlurbG, usually carried out by a sworn forest assessor. Various typical forest inventory methods can be used in the most efficient manner. The total value of a community of joint owners i.e. a FCS is calculated as the sum of the value of the soil, forest and other relevant values. By dividing the total value per the number of ideal shares, the value of one individual share is obtained.
3. **Calculation of claims:** A preliminary distribution of shares per each participant is worked out. On this basis the compensation value in form of shares of the new FCS and possible compensation payments are detailed. The participants can state on a planning form sheet their preferences and ask for further explanations. The practice shows that many preferences of participants regarding an additional allocation of shares or a waiver of shares can be fulfilled. In the end all shares have to be redistributed.
4. **Consolidation plan:** Contrary to the conventional procedures according to the FlurbG, this special GWG procedure includes a legal consolidation of property, which is why the plan must contain the settlement of all legal relationships that result from the consolidation. Other persons can participate in this step, which permits that landowners can exchange their private forest areas against equivalent shares in the FCS and transfer the areas to the FCS through a waiver on the land title. The shares are similar rights to land titles. Each participant owns a share of the joint total assets and has a claim of assigned shares of the same value in the new FCS. The compensations payments are balanced for the soil, forest and other values according to FlurbG. The consolidation plan is announced and the implementing ordinance for the set measures of consolidation is issued. The measures will then be implemented.
5. **Founding assembly of the new FCS:** The new FCS is formed at the decided date. At the same time the previous FCS and communities of joint owners disappear. The forest administration invites the first assembly of the new FCS. The main goal of this inaugural meeting is to decide a new statute and to elect a new board of the FCS.
6. **Closure of the procedure:** After all the required steps and measures are completed, the related entries of the land register and cadastre are corrected. With a concluding statement, the procedure is officially closed.

## 2.4 Overview on selected best practice cases

The main objective of the NRW pilot project is to evaluate the instrument of FLC of FCS in view of its possibilities for the activation of small-scale private forest owners and wood mobilisation. Results and lessons learnt from selected best practice cases in NRW and Hesse are assessed for broader national and international dissemination. In the following, a concise summary of each case is presented. The following six cases were analysed:

- **GWG Müsen:** A consolidation of five FCS of an original size between 71 and 164 ha. Through the merger, the new FCS with circa 500 shareholders reached a competitive size as a forest enterprise of 542 ha. During the FLC, over 20 ha of small properties adjacent to the FCS were acquired from the municipality and private landowners, which permitted to transfer fragmented unused private forests into viable units for forest management.
- **GWG Hilchenbach:** A large consolidation of five FCS into the largest FCS in NRW of 900 ha. More than 70 ha of previously unused forest areas of around 100 small-scale private owners could be included into the property of the FCS through purchase and exchange, which led to the reactivation of forest use of these areas. Around 300 forest owners were engaged in the FLC. Through its size, the FCS gained economic stability and a competitive position as a forest enterprise.
- **GWG Gilsbach:** Consolidation of five FCS into a new FCS of 616 ha. The structural conditions for forest management were enhanced decisively through extensive expansion and new construction of 27 km of forest roads (improved forest access: 43 m/ha road density). A total of 420 owners participated in the FLC. Six ecological compensation measures were accomplished to improve the landscape and biotopes. The enhanced size of the FCS reduces the business risk and allows generating more balanced yearly revenues.
- **FCS Wickersbach:** New foundation of a FCS through a conversion of a highly fragmented private forest property into community forest. The area of 9.15 ha was divided into 93 very small and thin land parcels, which belonged to a total of 65 private owners including 8 communities of heirs with 22 heirs. Through the FLC, the land fragmentation was dissolved and 57 private owners transferred their property into the newly founded FCS. The small FCS then merged later in a second procedure with a larger neighbouring FCS.
- **FLC Biebertal:** Optimal consolidation of a highly fragmented private forest of 47 ha. The area included 1018 land parcels with an average size of 450 m<sup>2</sup>, some of which were less than 1 m wide, belonging to a total of 185 landowners. The FLC achieved an optimal realignment of land parcels with a consolidation ratio of 9:1. An efficient method for the forest stock valuation was used and the landowners were consolidated into different groups of forest management preferences. A new forest owners association for joint management of 23 ha was founded and the traditional coppice use was reactivated.
- **FLC Niederndorf II:** A recently initiated, ongoing FLC procedure which aims at the consolidation of extremely fragmented small-scale private forest through the inclusion into an existing FCS. A total of 45 ha of private forest, divided in 13 blocks, are located within the area of a larger FCS of 400 ha. Belonging to around 300 landowners, they are today hardly managed, owing to a very disadvantageous form and insufficient access. The special feature of this FLC is the community forest's role as a driver to activate small-scale private owners: the FCS contributes significant financial means to acquire private forest areas and offers 80 inactive shares to be used in the FLC for exchange against land titles. Thus private forest owners will benefit from the FLC, but can also become new shareholders of the FCS.

The complete descriptions including maps, timelines and photos of these procedures are documented in the full NRW pilot project report (Kies & Peters 2017 b).

### 3 Evaluation of impacts and transfer of success stories

#### 3.1 Evaluation concept

Based on the general evaluation framework for wood mobilisation developed in the SIMWOOD project, a suitable list of categories and criteria was developed for the evaluation of FLC. The outcomes and impacts of FLC in general and of the GWG procedures in particular were described and analysed using the best practice cases selected in the pilot project NRW.

To show the broad spectrum of FLC impacts, the cost-benefit study of Hinz (2012, 2013) was also used, which is based on a value added model for FLC procedures in Germany defining 32 impact categories. These are measured through specific input factors and extrapolated to a period of 50 years. The study investigated 26 forest land consolidation procedures in seven German federal states, representing a total forest area of 8.700 ha and total costs of 29.9 mio. €. The selected best practice cases GWG Müsen and FLC Biebertal are among these.

#### 3.2 Key outcomes and impacts of FLC

The core of a FLC is the spatial readjustment and reallocation of small-sized property structures. In standard procedures according to FlurbG, this concerns mainly dispersed, fragmented land parcels of individual forest owners that are consolidated (readjustment of property). In the specific procedures according to GWG, forest areas of several FCS and possibly other private owners are merged in the consolidation. The main outcomes (outputs) of a FLC can be summarised as follows:

- *The number of land parcels or property units is reduced considerably and larger management units are formed:* The significance of the achieved result is expressed as the consolidation ratio of the number per initial land parcels per the number of consolidated land parcels.
- *Reduction of impeding boundaries:* The consolidation reduces the length of the land boundaries. Furthermore the form and location of the land parcels towards each other is improved, so that the areas can be managed with less interference onto the neighbouring properties. Interlocked properties of different types of ownership can be disentangled.
- *Essential features of property such as location, form, spatial concentration and access* can be optimised in the new layout of the area during the consolidation. Larger, more homogeneous units of property are formed.
- *The objectives and preferences of the forest owners are closely considered* during the consolidation. Different management types according to forestry criteria can be grouped spatially in a more logical way and more homogenous, larger forest stands can be created.

In procedures according to FlurbG, these outputs represent a main improvement for the individual forest owner and create new improved framework conditions for forest management. In procedures according to GWG, these results are of even higher significance than in standard FLC procedures: the ownership type community forest i.e. a FCS is not based on single land parcels, which is why boundaries of land parcels are dissolved extensively during a GWG procedure and one unified area (or a few larger blocks) of land owned by the community is formed. The enlargement of the area is per se an objective, as it is principally a legal merger of several FCS into one new FCS.

Additional measures are integrated in the consolidation of property to achieve the main objective. The range of potential measures is wide; hence each FLC procedure has its specific objectives and local characteristics. The interplay of these measures and the implementation in collaboration with the local actors determine the final outcomes and sustainable impacts of the particular procedure.

Table 5 summarizes the essential outcomes and impacts in a systematic classification. The classes were oriented along the concepts defined by Hinz, which have however been regrouped and appended with additional aspects.



Table 1 Classification of outcomes and impacts of forest land consolidations

Main outcomes	→	Impacts
<b>Consolidation of ownership</b> (1) Clarification of legal rights (2) Reduced number of single owners (3) Enlarged forest enterprise (members, shareholders) (4) Foundation of viable management or ownership forms (forest association, forest cooperative societies)  <b>Consolidation of land parcels</b> (5) Readjustment of property, reduced number of parcels (6) Reduction of impeding boundaries (7) Enlarged, optimised management units and/or forest stands (8) Activation of non-managed forest areas  <b>Infrastructure and other measures</b> (9) Forest road construction, increased / optimised access (10) Silvicultural improvements (11) Landscape and nature conservation functions (12) Recreation infrastructure	→	<b>A. Valorisation of ownership</b> (1) Ensuring the property, legitimation (2) Improving associability of owners or the joint property (3) Increase of land and forest stock value and stimulation of the property market
	→	<b>B. Enhancing forest management</b> (4) Simplified administration and timber marketing (5) Efficient timber harvesting and –transport (6) Increase of forest use / wood mobilisation (7) Raised awareness of owners for sustainable forest management (8) Improved forest stand quality and forest condition (9) Competitiveness of the forest enterprise
	→	<b>C. Recreation and cultural heritage</b> (10) Increased recreational value (11) Preservation of cultural heritage
	→	<b>D. Nature conservation and climate</b> (12) More stable forest stands (13) Soil and water protection (14) Biodiversity protection (15) Enhanced climate protection function
	→	<b>E. Macroeconomic effects</b> (16) Securing raw material supply, employment, value added (17) Improving workers' safety and prevention of accidents (18) Development of renewable energies

Source: own concept, based partly on Hinz 2012, 2013

Note: The table relates to FLC in general and shows the whole range of outcomes and impacts, including both the conventional FlurbG and the GWG procedures. In GWG procedures, the consolidation of ownership has however a significantly larger effect than in FlurbG procedures. Each FLC procedure has its specific setup and focus, which may include only a subset of components mentioned in this table.

The classification comprises 12 essential outcomes and 18 impacts in 5 thematic fields, which highlight the specific aspects of consolidations according to the GWG in NRW. All categories are described in more detail in the full pilot project report. In the following, only the most important advantageous impacts for small-scale private owners and forest management shall be highlighted.

### 3.3 Impact A. Valorisation of ownership

- *Ensured, legitimated property structures*: Establishing the boundaries is one of the most important results for the private forest owners, because it is often the first time that the property is identifiable without doubt. The precise surveying and valuation of property in a consolidation area provides a clear proof of the property. The readjustment of fragmented

land parcels creates more homogeneous property. Complicated ownership situations e.g. of communities of heirs are solved as far as possible. In procedures according to GWG all shares of the FCS are legitimised, which is a clear proof for the new stock book. The ensured property is a key improvement of the conditions for wood production in private forests.

- *Correction of unclear boundaries* and inconsistencies between the land register and the cadastre through renewed surveying. The small-scale private forest properties are often still from the old initial cadastre, therefore this step leads to a significant improvement of the cadastre.
- *Significant increase in value of the land and forest stock* owing to the improved boundaries, form, concentration and access of the property and the improved silvicultural management of the forest stands. An up-to-date valuation of the property is available as a result of the consolidation.
- *Forest property becomes available for the land market.* Forest areas with unclear boundaries and insufficient access are basically unsaleable. The land consolidation removes these deficiencies and the land becomes again interesting for buyers. An upturn of the local land market can often be observed as an outcome of a land consolidation.

### 3.4 Impact B. Enhancing forest management

- *One single legal entity* - the public corporate body of the new FLC - emerges from the FLC. The decisive factor here is the creation of one single FCS that bears the responsibility for forest management, which is the main advantage compared to a mere readjustment of existing property per owner. *One single forest area in joint ownership* as a result of the merger through FLC.
- *Eased administration* of the new FCS: Only on board and cash management is required, which accelerates the decision-making and the administrative tasks. Only one stock book needs to be maintained, which contains ensured land register entries.
- *Suitable enterprise size with economic advantages* for all shareholders in the new FCS. Enlarged enterprises can more easily implement a forest management on a regular basis. *Reduced enterprise risk* and/or economic security through more continuous yearly income.
- *Increased and optimised forest access:* The forest road construction measures are thoroughly planned and implemented by professionals during a FLC, and achieve a best possible result to enhance the accessibility of the area. These comprise the expansion of the existing forest road network and new constructions of road sections, which lead to an easier, faster accessibility.
- *Enlarged useable harvest area* owing to a smaller number of and an improved form of land parcels, more homogeneous forest stands with fewer concerned boundaries and related effects between forest owners. Timber stacks can be designed larger and be placed more rationally. *Significant cost reductions per hectare* in forest work and timber harvesting as a result of the consolidated property and improved access.
- *Activation of non-managed forest areas:* In the consolidation especially forest areas in unfavourable locations or with poor access get connected to the forest road network and are allocated in a more meaningful way in the overall property structure of the area. This enables management of these previously inactive areas for the first time.
- *Increase of the harvesting level:* In most FLC areas an increase of forest use can be observed (e.g. procedures in Rhineland-Palatinate measured an increase of 4 cbm/ha). Even though the full potential of the sustainable allowable cut is not attained i.e. on the same level as in the state forest, such a medium use level represents already a relevant improvement compared to a close-to-zero use level ('forest fallow').

- *Increased lots of timber*: Larger volumes of timber can be bundled on the optimised land parcels, which attain higher prices than small lots. Furthermore, the commitment of forest owners to carry out joint harvesting interventions increases as a result of the FLC.
- *Raised awareness for the need of forest management*: An essential effect of a FLC that should not be underestimated is the new awareness for forestry among forest owners who have been inactive so far. This is a result from the engagement of owners in the FLC over several years. It concerns the main challenge of wood mobilisation to initiate an active interest of private forest owners in sustainable forest management and wood use.
- *Higher motivation*: A higher demand for counselling by foresters and an increase of knowledge and motivation for active forest use can be observed among the forest owners. This increases the potential of the forest areas and the efficiency of the public advisory services in forestry.
- *Enlarged, optimised management units and/or forest stands* as a result of the consolidation generate suitable economic preconditions for a regular, profitable use of forest stands. By eliminating the effect of single land parcels, a newly founded FCS obtains the largest possible flexibility for the forest planning and development of forest stands.
- *Long-term silvicultural improvements*: With professional advice from foresters, an adapted silvicultural strategy for the forest enterprise is decided to ensure a continuous management in accordance with the forest legislation. In the long term this leads to a reduced risk of the forest stand and a higher productivity and quality of timber, which contributes to a gradual, continuous increase of value of the forest areas.

### 3.5 Cost-benefit calculations of FLC

The total costs of a FLC procedure are calculated as the sum of procedural costs and implementation costs. The *procedural costs* comprise work costs of the responsible land consolidation authority (personnel hours required), cost for services, subcontracting and administration. The main share represent with around 60% the tasks for working out the consolidation plan. The *implementation costs* comprise all costs for the complete realisation of the plan with all its foreseen measures, which include mainly surveying, placement of landmarks, road construction, water- and soil protection and landscaping. These costs are direct investments into improved structures of the private forest property. They can vary a lot depending on the complexity of the procedure. Especially the road construction represents usually a major cost factor in a procedure.

The procedural costs are covered by the Federal State of NRW. The implementation costs are cofunded from EU, Federal and State financial means and the assembly of participants. Notably measures of road construction, compensation, landscape development and parts of the land surveying tasks are cofinanced from public grants with a core funding level of 70% including VAT. The remaining co-payment is covered by the private beneficiaries of the procedure.

- *A high work effort is required for consolidations of highly fragmented private forest areas*, as show the costs of the example FLC Biebertal. The procedural costs and total costs sum up to 10 ths. € per hectare, which is double the average cost in procedures. However, the significant costs have to be seen in relation with the extraordinary results of the procedure, which attained a very high consolidation ratio of 9:1 into 101 remaining land parcels.
- *The principle of the co-payment amounts for private owners* shall be described with a calculation example (taken from the FLC Niederndorf II): For an area of 200 ha liable to contributions the implementation costs are estimated with 330,000 EUR, which of 100,000 EUR are to be covered by the community of participants. For the single land owner this corresponds to a calculated co-payment of circa 500 EUR per ha or approximately 5 Eurocent per m<sup>2</sup>. This magnitude is realistic and shows the comparatively minor cost for the single participant in a FLC procedure.

- *Procedures according to GWG can in general be seen as more cost effective*, because the effort is smaller than a conventional FLC according to FlurbG. The costs per area are far below the average owing to the fact that FCS bring in already larger, undivided areas into the procedures. The degree of fragmentation calculated over the whole area is lower in GWG procedures compared to FlurbG procedures, and the consolidation effect is hence more effective.
- *FLC procedures in Germany attain in average a total sum of impacts of more than 12 ths. EUR per ha forest area and an average impact-cost ratio of 3.5, according to the study by Hinz.* These values represent plausible minimum estimations. The FLC in this evaluation show a broad variation, owing to the different objectives and setups of procedures. The best practice example FLC Biebertal attained only a benefit-cost ratio of 2.4 below the average owing to the mentioned high costs. The procedure GWG Müsen attained a benefit-cost ratio of 6.9, which is high above the average and common for the cost effective GWG procedures in NRW.

### 3.6 Main challenges and factors of success for forest land consolidation

FLC in general and specifically the procedures according to GWG are less common and less well known than agricultural land consolidations, but there is sufficient experience and research evidencing their relevance for forestry. FLC have been and are implemented across the whole of Germany, in particular in forest regions with historically high forest ownership fragmentation, i.e. in NRW, Hesse, Rhineland Palatinate, Bavaria and Baden-Wuerttemberg.

- *It requires a lot of public information and individual consultation with forest owners*, to raise awareness about the benefits of proper forest management in contrast to inactive forest use. Private forest owners have generally strong emotional ties to their land. To convince a critical number of local forest owners to participate in a FLC requires a long process of engagement, which has to be well facilitated in a transparent and fair way to all concerned parties. In general only a few owners commit to participate right from in the beginning, while others remain hesitant and wait. More and more forest owners join in once concrete objectives and possible options become visible. Yet at the end still a certain number of owners usually remain sceptic or controversial about the initiative.
- *FLC are a legally regulated, official administrative procedures carried out by a responsible, neutral land consolidation authority.* They are aimed at sustainable development of rural communities, and the consolidation directly improves the value and viability of the property and leads to an activation of forest use. A positive commitment and collaboration of participants facilitates the implementation and is a main factor of success.
- *FLC proceedings according to GWG can only be initiated and implemented when the owners of each participating FCS have given a majority approval prior to the action.* Proceedings according to FlurbG do not have this legal requirement, which means that a procedure can be initiated by the authority alone without an approval of the landowners, if a benefit of public interest is identified. However, in practice a positive commitment of participants is usually ensured before a FlurbG procedure is initiated. A constructive collaboration of the concerned owners facilitates the implementation of any procedure and is a main factor of success of FLC.
- *The main disadvantage is that these procedures of readjustment of property are quite complex and costly* and therefore require several years for their full completion. Depending on their size and complexity, procedures according to FlurbG require between 5 to 15 years or more for completion. The procedures according to GWG are more flexible and require an average of 5 years duration. GWG procedures are more efficient, because they include a number of larger united forest areas (the FCS) besides parts of fragmented land, whereas the FlurbG procedures comprise exclusively small fragmented land parcels. Second, conventional procedures according to the FlurbG require a higher administrative effort compared to GWG procedures, which apply only parts of the FlurbG in a selective manner as needed for their purpose.

- *Important steps are already achieved a few years after the beginning of a procedure.* In a GWG procedure the main step is the foundation of the new FCS, in a FlurbG procedure it is the assignment of the new property borders. Furthermore the forest road constructions can usually be accomplished after 2-7 years. These interim steps represent immediate improvements for the forest owners.
- *FLC induce a large multiplier effect on regional value added and rural development, leading among others to an increase of wood mobilisation,* as was shown in comprehensive cost-benefit studies. A main advantage is that these FLC procedures are usually cofunded up to 80% from public funds (national and EU). This is especially important to facilitate the required investments from private owners.

### 3.7 Feedback from stakeholders and experts and transfer of results

The experiences from the successful best practice cases analysed within the SIMWOOD NRW pilot project have been reviewed by local experts, who were and are engaged in past and ongoing FLC, and were also communicated to representatives of the main target groups, i.e. private forest owners and forest managers.

In a series of three Regional Learning Lab workshops and additional interviews, a qualitative feedback on the role of FLC as an instrument for the mobilisation of private forest owners could be obtained. Also first exchanges with members of the SIMWOOD Advisory Board of the Regions (AbOR) have occurred to initiate possibilities for international transfer. The following notable feedbacks can be summarized:

#### a. *Feedback and transfer within the NRW model region*

- **Appraisal of benefits of FLC for small-scale private forest owners:** Private landowners, who have participated in FLC procedures, are usually very positive about the results and confirm the usefulness of the outcomes, i.e. valorisation of their property, activation of forest management and harvesting etc. Having completed the long, complicated process, they consider the results to be worth the effort. This is a general observation often found in the research, which was again confirmed by the responses from interviewed private owners.
- **FCS constitute a vital form of forest ownership:** Community forests comprise today around 42,000 ha or 4.5% of the total forest area in NRW. For historical reasons, their main centre is the Siegerland region (County of Siegen-Wittgenstein). While the traditional coppice forest system has lost its importance over the last century, the ownership form of the FCS is carried on and has proven a successful model for private forests: more than 17,000 private forest owners in NRW are today shareholders in around 280 FCS. The majority are smaller to middle-sized FCS with up to 50 members who are mainly active in firewood use for personal needs, which shows a certain renaissance given the present fuel wood boom. Besides there exist several larger FCS with up to 100 or even more shareholders, which are independent private forest enterprises managed on a professional basis to produce round timber for the market. Their success proves the suitability of the FCS model also for enterprises of this size class. The interviewed experts stated that the pilot has clearly highlighted the benefits of FCS for joint forest management and that further research is needed to address the class of larger FCS.
- **Consolidations of FCS are a success story to be further continued in NRW:** The regional consolidation authority BRA District Government of Arnsberg has completed around 45 FLC procedures according to the GWG in the past decades, whereby the number of FCS was reduced by circa 100 to a total of around 280 FCS today. Currently 9 FLC procedures are ongoing, and 5 new procedures have been proposed. BRA initiates in average around 2 new FLC procedures each year. The SIMWOOD pilot project results will be used as convincing key facts and dissemination material for the consultations and public events organised by BRA.



- **Higher visibility for the ongoing FLC Niederndorf II:** This recently initiated FLC procedure (see best practice example no. 6 will notably benefit from the further dissemination that gives them exposure as an ambitious novel FLC initiative with pioneer character. The SIMWOOD pilot project was introduced during the first assembly of the participant community on 23/03/2017 in Freudenberg.
- **FCS are officially promoted as a best practice model in NRW:** FCS are selected by the LBWUH State Forest Enterprise of NRW as one out of 8 main successful models for small-scale private owners and wood mobilisation, which were analysed within the recent project GemWaBewirt (acronym for 'joint forest management') funded by the German Forest Climate Fonds of the Ministries for Agriculture and Environment BMEL and BMUB. The SIMWOOD NRW pilot project and its results were presented on two occasions during the public events of the GemWaBewirt project as a) a panel speaker at the interim conference and b) a presentation at the final conference. Both events highlighted among others the special advantages of the FCS model.
- **Exchange with a private owners' initiative** in neighbouring regions of NRW: Since the NRW Regional Learning Lab RLL 1 meeting, contacts were established to the Sauerland region (County of Hochsauerland), where an emerging initiative is supported by the LBWUH for the foundation of a new local joint community of private owners. Results from the SIMWOOD pilot were shared and the FCS model is considered as one possible option.

*b. Outreach on the national level*

- **FLC are further improved as an instrument for land development:** The special FLC according to the GWG and their outcomes have sparked interest in other Federal states of Germany.
- The SIMWOOD RLL 2 meeting was used to exchange with other land consolidation specialists about the distinct aspects, benefits and outcomes of FLC in NRW compared to Hesse. As in most other German states, Hesse does not have a law comparable to the GWG which permits the consolidation of community forest. Potential innovative projects for exchange and collaboration on FLC between NRW and Hesse were outlined that could be realised within national territorial programmes (LEADER, ILEK etc.).
- Experts of the German national land surveyors' association DLKG Deutsche Landeskultugesellschaft were introduced to the SIMWOOD pilot results. The 38<sup>th</sup> DLKG annual conference in 2018 will be hosted by BRA in Bad Berleburg, NRW, and will be used as a national platform to showcase the FLC procedures in NRW.
- The pilot project results were exchanged with experts of the national research project Waldneuordnung 2020 ('New forest land consolidation') funded by the FNR.
- **Complementarities with FCS in Thuringia, Germany:** Thuringia, one of the Federal states that belonged to the former East Germany (GDR), has adopted the GWG from NRW to support the foundation of several new FCS since 1990 following the German reunification. The main purpose was to reinstall past community forests, which have had a long tradition in the region, but were transferred into public forests during the socialist regime. The first exchanges with FLC specialists turned out beneficial for both sides and will be further expanded.
- **Exchange with LWF** (SIMWOOD coordinator): FLC are also common in Bavaria, so the joint interest for collaboration on the topic is evident. FCS do still exist as old forms of forest property in Bavaria, but because a comparable legal basis such as the NRW GWG does not exist in Bavaria, they do not obtain specific support and are sometimes converted into private forest associations. Further exchange on both topics is foreseen.

### c. *International outreach to other model regions*

- **Members of the SIMWOOD Advisory Board of the Regions (ABoR) and other regions** have voiced out a high interest in the results of the NRW pilot project.
- Alvaro Picardo of the Regional Directorate for Forestry of Castile and León, Spain, and Juan Carlos Uriaguereka of the Basque Country Forest Administration, Spain, have confirmed the relevance of the concepts and findings for Spain, notably the Galicia region, where forest land fragmentation is high and new FLC initiatives are being started.
- Christophe Orazio of EFIATLANTIC, France, confirmed the major interest for the highly fragmented French private forests. Out of 3.5 million forest owners, 2.4 million or 2/3 possess land units of less than 1 ha. 1.1 million owners have properties larger than 1 ha, but those are divided into 5 million dispersed, non-connected land parcels, which of 4 million land parcels are again smaller than 1 ha.

## 4 Annex

### A.1 NRW Pilot project participants

- EFI European Forest Institute, Atlantic European Regional Office, Cestas, France: international forest research partner
- IWH Internationales Institut für Wald und Holz, Münster, Germany: national research partner
- BRA Bezirksregierung Arnsberg, Dezernat 33 (District Government of Arnsberg), Siegen: regional land consolidation authority, expertise on FCS and FLC in NRW
- LBWUH Landesbetrieb Wald und Holz (State Forest Enterprise of NRW), Münster, Hilchenbach: regional forest authority, various experts on private forest owners, community forests and FCS
- HVBG Hessische Verwaltung für Bodenmanagement und Geoinformation, Amt für Bodenordnung, Marburg: regional land consolidation authority, experts on FLC
- Forest cooperative societies (FCS) and private forest owners: participants of selected FLC procedures carried out by BRA

### A.2 Steps of the NRW pilot project

1. *Pilot project initiation and plan* (June 2015 - June 2016): Appraisal of existing background, initial data collection on wood mobilisation initiatives and actors in NRW; exchange with LBWUH experts; survey/focus study on forest management federations and joint timber marketing organizations; RLL1: FLC as main focus topic for the NRW pilot project
2. *Pilot project methodology* (October 2016 – June 2016): selection of best practice examples from successful FLC procedures; evaluation concept, suitable evaluation criteria and indicators
3. *Review and evaluation of FLC documentations from BRA* (March 2016 - April 2017): data collection; literature review; assessment of results; evaluation of inputs, outcomes and impacts; expert interviews; RLLs 2 and 3
4. *Dissemination* (June 2016 – June 2017): AFZ article together with LWF; posters during SIMWOOD Week (Edinburgh) and Midterm conference (Kilkenny); project presentations during RLL workshops, regional and international meetings (other EU consortia); SIMWOOD newsletter article; NRW full pilot project report in German and English; summary report

### A.3 Regional Learning Labs and other events in NRW

- *RLL1* on 16/06/2015 in Olsberg. Open stakeholder roundtable with 13 participants from the LBWUH, WBV NRW, and wood and paper industries. Presentations of the SIMWOOD project, Bavarian initiatives, GemWaBewirt project in NRW. Identification of regional barriers and priorities for wood mobilisation in NRW. Specification of FLC as the main topic of interest.
- *GemWaBewirt interim conference* on 08/12/2015 in Schwerte. Ca. 50 participants from state forests, private forest owners, planners and research. Presentations of GemWaBewirt objectives and activities and NRW State forest policies. Panel discussions including FCS success stories.
- *RLL2* on 24/03/2016 in Dietzhöhlztal/Hesse. Workshop with FLC specialist, 6 participants. Appraisal of first projects results, review and approval of criteria and evaluation plan, exchange on FLC procedures in NRW and Hesse and potential collaborations.
- *RLL3* on 24/03/2017 in Hilchenbach, 9 participants. Feedback collection from private forest owners and state forest experts. Assessment of practices and attitudes, lessons learnt and conclusions from FLC in NRW. Review of the draft pilot project report.
- *GemWaBewirt final conference* on 11/04/2017 in Arnsberg. Ca. 50 participants. One programme topic: presentation by BRA of FLC procedures and SIMWOOD pilot project results.

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