

Darwin Initiative for the Survival of Species

Final Report

1. Darwin Project Information

Project Ref. Number	162/13/020
Project Title	Conservation of Eastern European Medicinal Plants: <i>Arnica montana</i> in Romania
Country(ies)	Romania
UK Contractor	WWF-UK
Partner Organisation(s)	WWF-DCP, USAMV
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Project website	www.arnica-montana.ro
Author(s), date	Dr Susanne Schmitt with contribution from Dr Wolfgang Kathe, July 2007

2. Project Background/Rationale

Arnica (Arnica montana) is a traditional medicinal plant, widely used throughout Europe and North America. The dried flower heads and occasionally roots are used to prepare tinctures and ointments. *Arnica* is anti-inflammatory, counter-irritant and is mostly applied to heal wounds, bruises and burns.

The plant occurs in most European countries. Its favoured habitat are nutrient (nitrogen, in particular) poor, acidic mountain meadows. In most West and Central European countries, *Arnica* has disappeared from many parts of its original range within the last 30 years, due to habitat destruction or conversion, and over-harvesting. It is still collected in small quantities in France, Germany, Switzerland and Austria, but most raw material collected from wild populations originates from Spain and Romania, where several sound populations still exist.

The rarity of *Arnica* is reflected in red lists and legislation. IUCN - The World Conservation Union list *Arnica* as 'Critically endangered' (CR ; IUCN red list category) in many range countries. The European Union lists the species in Annex V of the EC Directive 92/43 (Habitats Directive) and in Annex D of the Commission Regulation (EC) No. 338/97. This law encompasses the EU implementation of CITES; its Annex D is an additional component (a kind of monitoring list, see Annex B of this report), listing a large number of non-CITES species which may become subject to trade restrictions if populations decline further.

According to official trade statistics, Romania exported about 33.5 tonnes of *Arnica* dried flowers to the European Union between 1997 and 2004, which is an annual average of about 4 tonnes (Lange & van den Berg-Stein, 2006). In reality, however, the volume exported was most probably greater. By conservative estimates, Romania supplies over 50% of the *Arnica* raw material from wild collection traded in Europe. However, the share of cultivated *Arnica*, mostly from France and Germany, has increased considerably over the last 5 years.

The wider project area along the Aries Valley in the Apuseni Mountains in Transylvania / Romania is one of the prime source areas for wild-crafted Arnica in Romania. The annual harvest in the wider area may provide up to one tonne of dried Arnica flower heads, accounting for a significant proportion of the European Arnica trade. Arnica collection provides an important additional income for many families in the mountain farming communities around Biharia / Iarba Rea and on the Plateau of Ghețari, where the project centre is located. Collectors are mostly women and children, but indirectly, whole families and also farmers of non-collecting families are involved in the process because the mountain meadows need extensive care (regular haying; no application of fertilisers) for Arnica populations to thrive. Arnica is a flagship species for this habitat type; its conservation and sustainable use contributes significantly to the conservation of many other plant and animal species.

This project aims at safeguarding the biodiversity of mountain meadows in the area by establishing a model of sustainable use of and trade in *Arnica montana*, which simultaneously addresses habitat conservation, local livelihoods and the maintenance of traditional mountain farming. If successful, this model can easily be scaled up and replicated elsewhere.

The main components of the project are

- Research on biological sustainability of Arnica collection
- Evaluation of cultural and socio-economic context of management
- Study of Arnica trade chain
- Development of model for sustainable harvesting practice and harvester training
- Investigation of incentive systems for farmers to maintain their traditional management of Arnica meadows without fertilization
- Capacity building in value adding through local Arnica drying and direct sale to achieve higher returns for harvesters and benefits for farmers

The need for this work was identified by the project leader and a number of colleagues at WWF Germany, Traffic International amongst other organisations. A number of us have been trying to suggest ways to encourage more sustainable-use of MAPs and explore the link between the conservation of habitats and traditional landscapes and sustainable use and more equitable trade of MAPs. There was a distinct lack of concrete example to show the potential link. The choice of *Arnica montana* is due to a combination of its popularity and the known link between habitat loss/management and the decline in its natural range.

The field area was suggested and the contact with USAMV was facilitated through the project officer Dr Barbara Michler, who had conducted research on Arnica ecology and sustainability in an earlier project called 'Project Apuseni' of the University of Freiburg (Rușdea *et al.*2005). Dr Michler provided all the detailed background information for the development of project proposal.

3. Project Summary

For the log-frame see 19. Appendix V.

Purpose

To develop a model for the sustainable production and trade of *Arnica montana* resulting in benefits for biodiversity and livelihoods; the principles of which can be used to inform the development of conservation approaches and methodologies for other endangered medicinal and aromatic plant (MAP) species and their habitats.

Outputs

- Resource management and Trading Association (RMTA) founded at Gârda de Sus (GdS)
- Arnica management plan written, accepted and implemented
- Harvesters & farmers trained in sustainable harvest, habitat management & drying
- RMTA/company agreement based on sustainable sourcing guidelines
- Awareness raised on benefits of sustainable harvest of MAP among harvesters, farmers, government agencies and academics

Two modifications have been made to the log-frame:

- 1) The foundation of a RMTA, as originally planned, proved to be impossible due to legal and structural barriers. The decision was made to establish two distinct management structures, that will collectively achieve the same results as the RMTA (see 2005 half year report):
 - a) A local NGO / association called ECOFLORA;
 - b) A social enterprise called ECOHERBA Ltd., which, in effect, is the business arm of Ecoflora a harvester and landowner association;
- 2) No sourcing guidelines were developed. Instead, harvester guidelines and a statute for the NGO will be developed to guarantee sustainable sourcing and trade practice (DARWIN was informed in October 2005 and agreed to this change).

See Appendix 1 for the articles of the convention that have been most relevant to this project.

Overall, the project has been very successful. This is despite considerable internal team difficulties as well as considering that we introduced very new concepts of sustainable-use and social enterprise to both the young professionals in the team and the community with whom we were working.

All the objectives were met. Although the management plan was produced late, the main components and main messages of it have been distributed throughout the final year of the project and through training, using the harvester and meadow management manual, through direct training in drying and through a number of discussions and presentations to relevant stakeholders (e.g. PNA director and scientist and directors of Ecoherba and members of the Ecoflora; National workshop). At the time of writing, the management plan is being translated into Romanian and copies will be handed to Ecoherba/Ecoflora, the PNA and all partners and relevant stakeholders.

A significant additional accomplishment is that more people have attained or are in the process of attaining formal qualification as a result of the project than initially stipulated. Two diploma theses instead of 1 were completed and in total 3 Masters theses instead of 2 were completed. The third one was completed by Adriana Morea on the development of an optimum drying regime for *Arnica montana* using the experimental and then the full-capacity dryer. Adriana is now studying for her PhD on the topic of meadow management for biodiversity. Andre Stoie, who has worked as a botanist on the project, is now studying towards a PhD of the flora of Gârda de Sus.

The introduction of the concept of a social enterprise added a new aspect to the work of the project. Social enterprises are social mission driven organizations which trade in goods or services for a social purpose (Wikipedia, 2/5/07). Since our aim was the sustainable and equitable utilisation of Arnica for the benefit of conservation and livelihoods, the relatively new concept of a social enterprise provided a focus for the business related work. This work is the key to creating additional livelihood benefits, which in turn are to provide incentives for the local community to continue managing the meadows in a traditional way. To help plan for, assess the profitability and the usefulness of the governance and structure of the business and the association, external business expertise was needed. Parallel to tapping into Romanian expertise, SFS succeeded in getting *pro bono* work from 5 University of Oxford Saïd Business School MBA students. The students visited the project site and worked with the team to develop a business plan as part of their MBA studies. The MBA student Jessica Shortall facilitated additional *pro bono* work by an organisation called 'Architecture for Humanity', who developed the locally compatible architectural plans for the main dryer built in the final year of the project. She also managed to get extra publicity for the project (see output 15c in Appendix III).

4. Scientific, Training, and Technical Assessment

Research

Management plan

Apart from the training work undertaken, all research and its results and practical application for the sustainable management and trade of Arnica is provided in the *management plan (Annex 1) as the main reference document*. After consultation with the community and the project team, the management plan was written by the project officer, BM, with input and/or use of data from FP, RP, HP, AM, MK and SFS.

The management plan is structured so that most of the appendices are short operating procedures (OPs) as guidelines for relative lay people to conduct all tasks related to the sustainable use and trade of Arnica ranging from the monitoring of the resource, drying as value-adding to exporting. The management plan will hopefully provide a valuable resource for other operations that are trying to replicate our approach for the sustainable use of Arnica or other natural resources elsewhere.

Resource assessment of Arnica Montana based on monitoring and inventorying

Inventory of the Arnica resource and monitoring density and flowering rate over time and in different habitat types were essential to establishing the quantity of the resource (resource assessment) or in other words the sustainable yield/annual off-take of Arnica flower heads in the commune of GdS. Knowing the sustainable yield is also the key piece of information needed to evaluate the level of income that can be gained from the sustainable use and trade of Arnica.

Although much information already existed from the Project Apuseni (Michler & Reif, 2002; Michler 2005) much time was still needed to complete this research as it involved mapping of all Arnica areas (southern part of GdS not previously covered). Resource assessment is based on a landscape approach. The occurrence of Arnica sites in the landscape depends on the parent rock, soil conditions, relief, local climatic features and management activities. These parameters are highly variable themselves and occur in various combinations. Observations of the last years show that the numbers of flowering individuals per site vary from site to site and from year to year. The procedure of resource assessment is described in short in the table below (for details see Annex 1).

Resource assessment (Michler and Reif 2002, Michler 2005)	
Parameter	Result
➤ Rough field survey of <i>Arnica</i> habitats	➤ Information on species composition of habitats, limits of habitat distribution
➤ Generating mapping key of <i>Arnica</i> habitats	➤ Key species for mapping
➤ Mapping <i>Arnica</i> habitats (inventory)	➤ 596 Polygons ➤ 550.9 ha
➤ Calculating size of the sites	➤ Size of each polygon is calculated
➤ Random selection of a subset of sites	➤ 58 random polygons ➤ 54.1 ha
➤ Selection of largest sites	☐ 50 largest polygons ☐ 327.5 ha = 60% of total mapped area
➤ Counting the flower heads in selected sites in transects of 30*2m, number of transects in relation to the size of the site, 4 transects per ha are recommended.	➤ Flowering individuals per m ² per polygon
➤ Calculating an estimation for all polygons	➤ $\sqrt{\text{Stems} / \text{sqm}} = 1.092 + 0.113 \cdot \ln(\text{ha})$
➤ Counting flower heads per stem (very large sample)	➤ Average number of flower heads: 1,9
➤ Counting flower heads per kg fresh weight	➤ 1008 flower heads per kg
➤ Drying samples	➤ fresh weight:dry weight=1:5,8
➤ Calculating flower heads per kg dry weight	➤ 5797 flower heads per kg
➤ Calculating resource	➤ 15,8 fresh weight; 2,8 t dry weight
➤ sustainable yield = 50%	➤ 7,54 t; 1.4 t dry weight

Ideally annual monitoring of *Arnica* flower heads and habitat management (for early identification of changes such as fertilisation and abandonment) is required to calculate the sustainable yield. Relatively short operating procedures are available as appendices in the management plan (Annex 1) to allow lay people to carry out the monitoring.

Arnica quality control, purchasing and traceability:

As a result of training harvesters, a simple quality control system was established (see Appendix 10 of Annex1)

Harvesters (mostly women and children) were trained in both more formal (training in schools) and informal sessions (before collection with help of manual). Textile bags were handed to collectors, collection was only allowed after the dew had dried and on days without rain. Only fully blooming flower heads (no buds & faded flowers) are allowed to be collected. The harvested material had to be returned to the collection points on the same day to be checked and, if of insufficient quality, sorted or even rejected. The collected material was then weighed and harvesters were paid.

Receipt and purchasing forms with charge numbers were completed for each transaction. A charge is called what is collected at a certain day and brought into the dryer on that day. Each contribution to a charge has to be traceable back to the harvester to allow quality control and fulfil traceability requirements for organic certification (see below).

Establishing an optimum drying regime and building driers:

After BM researched to find a locally suitable design, an experimental dryer was built in 2004. The field seasons of 2004 and 2005 served to complete the drying experiments and to obtain enough data for the design of a full-scale drying house that fulfils the necessary requirements in terms of product quality and capacity. Through the help of the MBA team (see business plan research) *pro bono* work of Chris Medland, Building Design Partnership, London and Manchester (working for Architecture for Humanity; <http://www.architectureforhumanity.org/>), provided the locally adapted design and architectural plans for the dryer (see Appendix 12 in Annex 1: management plan).

For detailed description of the drying experiments and results see the management plan (Annex 1). The key information required to estimate the total amount of fresh Arnica flowers to be harvested to achieve desired amount of dried Arnica, is the fresh *versus* the dry weight ratio. The research under this project established that the median ration is 1 : 5.5 +/- 0.4, which is within the known range for Arnica. The drying temperature must not exceed 40 degrees Celsius to avoid the loss of the volatile active compounds. With this known information the average drying time can be experimentally established and calculation on capacity of the relevant dryer can be obtained. The average drying time for Arnica is around 4 days.

Supply chain research in Romania and Western Europe:

Michael Clements led on the Romanian supply chain study (see Annex 2). First he conducted a survey of the availability of Arnica products in the domestic market and their demand for his diploma thesis. This work was mainly conducted through questionnaire surveys of consumers of products and by surveying the products of 50 pharmacies and 'green shops'. In 2004 he found that 17 domestically produced Arnica products (crèmes, gels, teas) and 3 imported products were available. By 2006 the number of domestically produced products had risen to 27 and a big surge of imported products (22) was noted. Non of the Romanian produced products were exported.

He then embarked on establishing the local, regional and national supply and value chain for Arnica. His results are summarised in Figure 1.

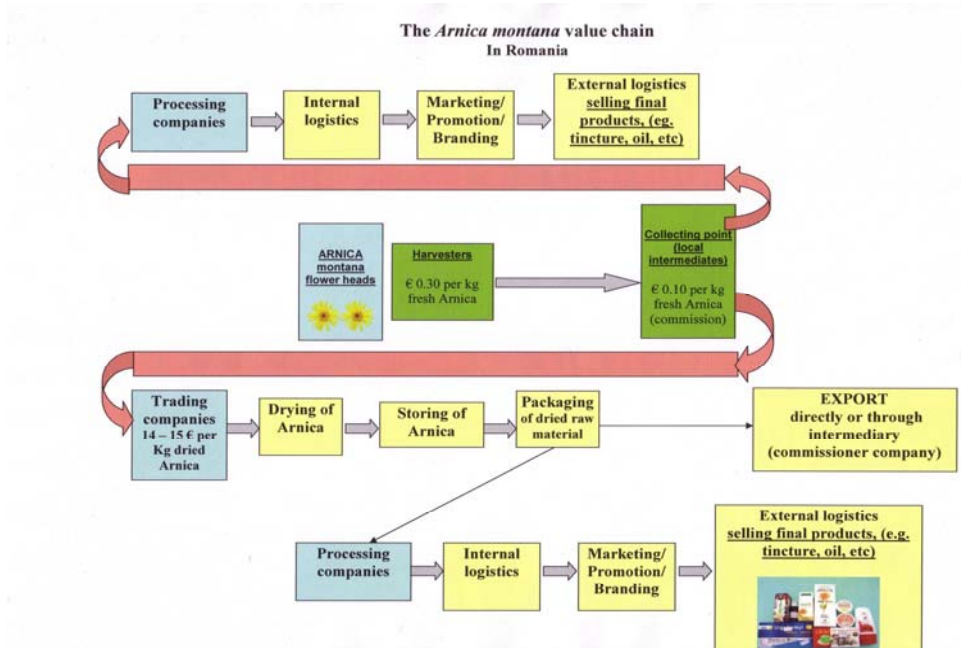


Figure 1: Arnica supply chain.

As is the case with many other MAPs in trade, the market demand for Arnica is fluctuating from year to year resulting in highly unstable prices. For example towards the end of 2002 there was massive demand from Germany for Arnica. In 2003, this led to c. 30 tonnes being exported at an average price of 18 Euros per kg. With high volume collection in 2004 but declining demand the prices started to come down to 12-14 Euros with a build-up of stock and a collapse in the price in 2005 to 4-5 Euros per kg. Longer term contracts between importing companies and traders in Romania could avoid such fluctuations, but this is still uncommon practice. It is however, a practice that should be encouraged and was achieved under this project through the 5-year contract between Ecoherba and Weleda (see Annex 3).

80% of all Arnica collected in the wild is exported to Germany. The rest of the exported material goes to mostly 3 other countries: Italy, Switzerland and France. In total about 90% of all collected Arnica is exported and only an estimated 10% or less is for the domestic market (Kathe *et al.* 2003). It is difficult to get exact figures for the domestic market, because companies hesitate to provide information and the domestic trade can not be monitored as well as the export trade (export licence required). Through the company survey and extrapolation MK estimated that the national demand for dried Arnica flowers is about 1 tonne.

MK's research found the Romanian MAP market somewhat vulnerable because local companies are not sufficiently oriented towards their clients' needs and have not fully adapted to new quality requirements and adherence to guidelines and standards (e.g. Good Manufacturing Practice, ISO9001). As a result Romanian products are not able to penetrate the export market. On the whole, capacity to create and establish brands is very low and companies do not make best use of information technology and marketing (e.g. having a good web-site & mail order).

As part of his master thesis he also conducted a tourist questionnaire survey (semi-structured interviews of 400 tourists) on the interest and willingness to buy different Arnica products (oil & tincture) and other natural products (e.g. dried mushrooms, syrups, jams) as a way to establishing potential demand for further value-added products locally in Gârda de Sus. His findings support the thesis that the local tourist market could significantly contribute to the income generated by Ecoherba from selling Arnica oil and tincture, which are higher value-added products. The production of oil and tincture would have to be out-sourced to a licensed laboratory, but it would still make economic sense to do so. Demand for other natural products is also potentially significant.

Dr Dagmar Lange and Susanne van den Berg-Stein, University of Landau, Germany were hired to research the status of the Western European market for Arnica (see Annex 4). The information was gathered mainly through interviews with processing companies, herb traders and experts in Arnica cultivation; an evaluation of pharmaceutical databases, review of brochures, price lists of relevant traders, internet searches, evaluation of catalogues of relevant trade fairs and analysis of the EU import figures based on Annex D for Arnica Montana.

The analysis focused on imports into the EU and on the German market. Mainly botanicals of Arnica Montana are used; *A. chamissonis* and Mexican Arnica (*Heterotheca inuloides*) are of minor importance. Whereas, generally, the most used plant part is the dried flowers, dried roots is the basis of the mother tincture demanded by homeopathic companies. There is a wide range of Arnica-based products on the German market: currently, not less than 443 remedies processed by 94 companies are available in German pharmacies. The annual demand in Arnica flowers amounts to c. 10 tonnes, the demand in roots to c. 1 tonne, and the demand in tincture to some 300 litre. The figures provided by the wholesalers are somewhat higher; however they re-export some of the imported botanical raw material. Furthermore, these data correspond well to the import figures of Arnica based on the Annex D-trade-

data. The latter revealed also, that Germany is probably the most important importer of Arnica flowers in the EU. According to all sources, the main country of origin for Arnica flowers is Romania, followed by Spain becoming recently less important. Regarding Arnica flowers, wild-collection predominates, but cultivation is known on 27 hectares in Germany and France. For many of these companies, processing firms and wholesalers, Arnica is important, and the commodities showing steady sales figures. In general, Arnica flowers are much more expensive than many other botanicals. Prices for Arnica flower fluctuate very much, in 2003 1kg Arnica flowers from Eastern Europe fetched a price of 19 €, in 2004 1kg flowers from the Ukraine only 10-12 €. Whereas all wholesalers purchase the botanical raw material, only less than one third of the pharmaceutical companies buy Arnica flowers or roots, and the remaining purchase semi-processed products, like mother tincture or extract. To purchase the required raw material via intermediaries is very common. However, there are wholesalers and pharmaceutical companies buying the commodity directly from the producer, and some of them have even trade relations with Romanian firms. Changing suppliers is generally seen as difficult. However, four companies showed their interest in getting into contact with the Romanian Arnica project.

Socio-economic research and community attitudes:

This aspect of the research was less extensive and formal, as it was found that very good information already existed on livelihood strategies and income sources and levels. This and other socio-economic information was collected and analysed by E. Auch (2006) under the previous Project Apuseni, University of Freiburg. Nevertheless, the project team established much valuable socio-economic information throughout the project.

One of the approaches taken was to identify key members in the community that had influence and were willing to work with the team towards the objectives of the project. The support of the major, the local school director, Dana Bate (a young local school teacher), the local doctor, 2 pension/hotel owners and the shop keeper and the priest, amongst others made a big difference. Most were members of the local advisory team. These individuals together with all the sensitisation work (see below) were crucial in breaking down barriers and getting people more interested in the project and its potential benefits. Overall, the community was found to be more open to the project and its idea than during previous projects. The project team felt that people had become more used to outsiders and more willing to take some new ideas on board.

The more formal socio-economic research by the team mostly concentrated on finding out Arnica landowners and their families and then learning about their attitudes, in particular with regard to meadow management. This was done through interview-surveys conducted in (i) the winter of 2004/5 with the help of the Dana Bate and Tino Goia, (Ethnographic Museum, Cluj), in (ii) the spring of 2006 to complete the identification of Arnica landowners (150 identified), and in (iii) the autumn of 2006, landowners were interviewed to identify their past and present meadow management practices and the future outlook through a semi-structured interview survey. In total 83 landowners were interviewed by FP with the help of USAMV students on meadow management practices. The survey took the form of a semi-structured interview and also contained an element of training on meadow management. The survey found that 20 out of the 83 do not cut their meadows, but only used them as pasture, whereas the rest (63) cut the grass for hay as well as grazed their livestock on it. Except for one farmer, who had a grass cutting machine, which is, however, not suitable for very steep and stony terrain. Most can also not afford such a machine.

In addition, 76 out of 83 manage the land actively in terms of fertilising and/or controlling ants and/or wood growth and use the land for mowing or grazing whereas 7 use the land for grazing and mowing only. The latter put no efforts in active management. 60 out of 83 fertilise the land, whereas the others do not apply manure. The result is summarized and documented as a seasonal work plan (see below) and in the meadow management manual (see Appendix 15 in Annex 1).

The analysis of formal and informal socio-economic data has remained a problem. Despite the social survey skills course in October 2005 (see Annex 5), analytical skills of the project team did not improve significantly.

Seasonal work plan for *Arnica* habitats. Based on interviews with 83 landowners and field observations

	Month	Activity	Execution	Observations
Spring	March (the end)	Fertilising	For transport horse carts are used. Spreading is performed manually. The manure quantity applied on <i>Arnica</i> meadows is smaller than the one that is applied on meadows that are more productive.	The fertilizer quantities differ very much. The majority of landowners fertilize in spring (38 answers out of 60 possible ones, the others do not fertilize the land). In general, the manure is from cattle and horses. It is 6 months old and mixed with saw dust from wood processing and dried beech leaves which are used as litter in the stables. The manure is spread manually from small piles deposited by horse and cart.
	April	Gathering rocks	Manually	The rocks are frequently deposited in piles at the margin of the site.
	April	Controlling ants	Manually	
	April	Controlling wood growth	Manually	Mostly <i>Salix caprea</i> , <i>Sorbus aucuparia</i> and <i>Prunus spinosa</i> are eliminated.
	April	Crushing applied manure	A horse drags a branch, on which rocks are fixed to make it heavier.	This work is performed generally one week after the manure has been applied (valid for the ones that fertilize in spring). The crushing of manure applied in autumn is performed in spring. Rain determines when work starts.
	April	Gathering uncrushed remainings and beech leaves	Manually by rake	The gathering of un-crushed remaining is generally performed until one month after crushing. The uncrushed remainings are deposed in a pile on the area on which they have been gathered. Simultaneous with remainings, the dried beech leaves are gathered.
	May	Controlling weeds	Manually with scythe, reaping hock and knife	In general, the following species are eliminated: <i>Colchicum autumnale</i> , <i>Veratrum album</i> , <i>Pteridium aquilinum</i> and <i>Arctium lapa</i> . This work done regularly by only a quarter of the respondents (21 out of 83).
	May	Repairing damages caused by wild boars	Manually by hock or rake	The biggest damage is done on meadows. This work is done along the entire year as many times as necessary.
	May	Grazing	-	Some grassland is grazed only in spring and in autumn (22 of 78 answers) others are grazed from spring to autumn (10 of 78 answers) and others only in autumn (38 out of 78 answers). The grazing is generally done by cattle and horses. The beginning of grazing is, in most cases, random.
Summer	June-July	Harvesting <i>Arnica</i> flower heads	Manually	
	July-August	Mowing of meadows	Manually	<p>The <i>Arnica</i> meadows are mown a maximum of once a year at the end of the mowing period. First the locals cut productive meadows without <i>Arnica</i>, after the less productive ones with <i>Arnica</i> are cut. The mowing height is very low (2-3 cm from surface). The grassland remains sometimes unmown. Reasons for this are:</p> <ul style="list-style-type: none"> ➤ The grass is not needed because the locals have already enough from sites that are more productive. ➤ The productivity of the grassland is too low to take the effort to cut it. ➤ The owners didn't manage to cut the grass in time. ➤ The owners are too old to do the exhausting job.

Organic wildcrafting certification and pilot ISSC MAP certification:

Organic wildcrafting certification was proposed early on as another form of value-adding and increasingly a requirement of the more ethical and environmentally conscious market-place for herbal products. Organic wild crafting certification in itself does not provide sufficient assurance of the sustainability of the product in the absence of proper resource assessment and it makes no requirement on the fair treatment of harvesters. This has been pointed out by WWF, TRAFFIC, IUCN and the German Federal Agency for Nature Conservation (BfN) for a number of years. The development of more rigorous sustainability (and to some extent fair trade) standard has thus taken shape and our project became a pilot test case for the new International Standard for Sustainable Wild Collection of MAPs (ISSC-MAP; www.floraweb.de/map-pro). As a result the Swiss certifier IMO (www.imo.ch), who has been very active in the sustainable organic MAP discussions, carried out the organic wildcrafting and the ISSC-MAP pilot certification. The project met the requirements with some conditions, mostly related to record keeping and traceability (see Annex 6).

In the post-project phase Ecoherba/Ecoflora were supposed to become a pilot implementation project for ISSC-MAP. However, funding has not been forthcoming, because Weleda, Germany, with which Ecoherba has a 5-year company partnership, has not been willing to sponsor the pilot implementation phase.

Bearing the cost of organic certification in general will remain a problem for Ecoherba unless buyers are willing to pay a sufficient premium to cover the extra cost. For the 2007 harvest Weleda agreed to pay for Romanian certifier to do the basic organic wildcrafting certification according to EU regulation 2092/91, which is much cheaper than paying for a Swiss certifier and for the additional ISSC-MAP. However, the rigor of the cheapest certification, and its indirect function as an independent audit of compliance to the ethical standards may be more questionable.

Resource Management and Trade Organisation (RMTO) cum social enterprise establishment and business plan research:

The following steps to establish the RMTO Ecoherba and Ecoflora were taken.

With the sustainability parameters of sustainable yield and harvesting quota, monitoring and inventorying and drying guidelines established and the dryer build, the main ecological and value-adding baseline information was established. Also a sufficiently large pool of trained harvesters was established and local people willing to be involved in the business were identified by year 2. In parallel to this process the project team, in collaboration with prominent members of the community explored the best legally acceptable model for a resource management and trade organisation. This resulted in the founding of the association Ecoflora and the company Ecoherba Ltd, which is the business arm of Ecoflora. Both were found on the basis of ethical statutes that stress the commitment to sustainable-use of the natural resources (i.e., Arnica) from the local area and the fair treatment and pay for collectors, members of Ecoflora and staff of Ecoherba, and landowners.

The specific objectives of Ecoflora are:

- Maintaining the populations of wild plant species
- Maintaining the cultural and natural mountainous landscape
- Supporting the local communities in sustainable use of the natural resources by traditional and modern methods

- Maintaining and supporting the traditional management of the meadows, management that generated the large flora diversity and cultural landscape of the Gârda de Sus area
- Awareness raising regarding the protection of nature etc. with a special focus on local communities

The main objectives of Ecoherba are:

- To process/add value to local natural resource (e.g., Arnica and others)
- Together with Ecoflora monitor the sustainability of the harvest of local natural resources
- To obtain all necessary permits (e.g. collection and export permit) and pay necessary taxes
- And to trade the products locally, nationally or internationally as appropriate

The association Ecoflora owns 40% of the business Ecoherba Ltd. Ecoflora also owns the drying house and Ecoherba has to rent it and pay Ecoflora. 40% of any profit made goes to Ecoflora to pay from it amongst other things the compensation payment to *Arnica* meadow owners. So far no legal basis exists on which to distribute the compensation payment due to unclear landownership. Until landownership is established, any profit of Ecoherba is likely to be reinvested in, e.g., improvement of business and awareness raising.

The main constraints and challenges we encountered during set-up:

- Finding the most ethical and participatory model that is legally acceptable; esp. representation of harvesters & land-owners.
- even with help of MBA business planning could not arrive at totally realistic figures & clear profit projections.
- Working out the right drying regime and building the right dryer has been time-consuming.
- Establishing simple operating procedures (Ops) that can easily be followed by staff & harvesters.
- Complying with regulations: collection and export permits; tax & licencing, etc.

In the post-project phase the main challenges will be:

- to diversify as soon as possible, because profit from Arnica not enough to make business viable.
- No further funding & loans to consolidate Ecoherba & Ecoflora's establishment
- For members of Ecoflora and directors of Ecoherba to remain committed even without initial profit.
- Lack of support from PNA and ability its ability to integrate Ecoherba in local branding and marketing effort due to lack of funding, capacity and government support to PNA.
- That access to EU subsidies still several years away.
- Absence of further training, e.g. in marketing and business administration.
- Maintenance of ethical and quality standards otherwise risk to loose Weleda as long-

term buyer; losing organic certification, risk of over-harvesting of resource and misuse of capital equipment (i.e., drying house, car).

- Harvesters and landowners remain committed to quality, sustainability and managing their meadows – need to have other incentives to maintain traditional management (e.g. subsidies for environmentally friendly management).

Training and capacity building activities:

Young professional training:

Fieldwork and analysis (output number 5). The originally proposed output to train 3 project staff has been exceeded. The project initially trained 4 young professionals (Florin Pacurar (FP), Horatiu Popa (HP), RP and MK) in 2004. Three additional young professionals joined the project: Mona Cosma (MC), Adriana Morea (AM), and Bogdan Pelger (BP). BP has replaced Valentin Dumitrescu, who worked as interim IT specialist between October 2004 and February 2006; worked in the office and was less actively involved in field work. MC and AM started working for the project during the 2005 field season and officially became team members in March 2006 (part-time). MC is an agronomy student at USAMV and was trained by BM in buying fresh Arnica flower heads from trained harvesters in 2005; AM is an agronomy engineer student at USAMV and was trained in Arnica drying and data management by BM in 2005.

The main tasks completed in field work and analysis were as follows:

FP: Local project co-ordination; communication with the local population in the project area and with authorities

HP: completion of inventory and continuous mapping of Arnica meadows; contact with Apuseni Natural Park; compilation of first draft of landowner list

RP: population survey of Arnica in the project area; assistance in the organization of local events; assistance in developing Ltd/NGO; research on certification possibilities for the operation (organic wild-crafting)

MK: interviews with collectors, local traders and companies; assistance in the organization of local events; assistance in buying fresh Arnica from harvesters; assistance in developing sheets for documentation of Arnica purchase / sale

MC: running the buying point for Arnica during the harvesting period

AM: assisting BM in Arnica drying and data management

All local team members were supported by BM in the field work. Data analysis has been mainly carried out by BM.

In addition, every year, about 40 students from USAMV were employed as casual helpers during the peak field season and received training in Arnica monitoring, meadow management and related ecology.

Dr Paul Jepson, Oxford University Centre for Environment, conducted a four-day training course in Social Survey Techniques in the project area between 25 and 28 October 2005 (see Annex 5). All local project team members and several local researchers participated in the course.

The training of the young professionals was overall successful. The development of a team spirit and mutual assistance between the local team members was very positive. Inter-disciplinary work improved during the life of the project. After a relative slow start, the strengthening of local buy-in and development of a participatory approach with the

local population in the project area, was very successful. In particular, Dana Bâte, supported by Varciu Marin, the mayor of the community of Gârda-de-Sus, assumed responsibility and worked towards establishing the project within the local community.

Masters:

The masters of MK and RP were completed ahead of schedule specified to Darwin of October 2006. One student from Babeş Bolyai University (UBB) in Cluj, Razvan Popa (RP), has successfully completed his master thesis in early 2006. The topic of his thesis was the phytophage-complex on *Arnica montana* in the project area. He analysed the most important families of insects and arachnids living or feeding on Arnica flowers or being directly associated with Arnica. As pest infestation can be a problem for the quality of Arnica flower heads in other source regions, RP's research was important for the project and for potential buyers of Arnica (see Annex 8).

The second master student, Michael Klemens (MK) completed the thesis in summer 2006. Based on the results of his diploma and on data already obtained during the 2005 Arnica season (about 400 interviews), MK analysed the potential Arnica demand and consumer behaviour of tourists in the project area. This is an important factor in the local marketing of value added products and product diversification. His findings support the thesis that the local tourist market could significantly contribute to the income generated by Ecoherba from selling Arnica oil and tincture, which are higher value-added products. The production of oil and tincture would have to be out-sourced to a licensed laboratory, but it would still make economic sense to do so.

An additional master thesis was produced by Adriana Morea (AM), who used the data and knowledge gained from working on Arnica drying to complete a thesis on the drying process of Arnica. She is now studying for a PhD related to meadow management and Arnica.

Andre Stoie, who was the project botanist, has used the data collected during the project to study towards a PhD at USAMV.

The project officer, Barbara Michler (BM), and the supervisors of the master theses, Dr Tamaş and Dr Coldea (for RP), and Dr. Paina (for MK), provided very helpful support. Both master students made good progress towards improving their conceptual thinking and working, their communication and team work skills and in taking over more responsibilities within the project.

Training and sensitisation of harvesters and landowners:

Particularly at the beginning, but continuing throughout the project, the local community was informed and sensitised about the project and its objectives through a number of different techniques. These ranged from giving talks, having posters and stands at local fairs and in the church, having event days for the children, etc.

Sourcing and harvester training

In 2004 and 2005, sourcing and harvesting methods were developed. Textile bags were handed over to the collectors only if the weather conditions were suitable and were accepted only the same day. The collectors were trained to pick better quality *Arnica* flower heads. The training focussed on:

- Picking flower heads only during dry weather conditions
- Using the textile bags they get from the sourcing team
- Picking only flowers in full bloom
- Picking flower heads without stem
- Leaving buds
- Leaving flower heads for seed production
- Delivering the flower heads in textile bags immediately after picking

In cases where collectors brought sub-optimal material the sourcing team sorted through the material with the collector, and if the quality of material was too bad the team refused to buy it. Based on this experience a harvester manual was developed.

In 2006, the collectors were trained again when they got the textile bags for collection and issued with a harvester manual. In total 180 harvesters were trained directly and 280 harvester manuals were distributed (incl. in the wider region and some other audiences). The training was effective and the collectors adapted to the new system. This was reflected in the quality of Arnica flower heads collected. The rejection rate was about 15% in 2005 and reduced to 5 % in 2006.

However, it is necessary to honor the extra effort with a higher price. It is much more time consuming to collect good quality and to follow the harvesting guidelines. The sourcing/rating team (project members) trained the local buyers in rating the collected Arnica and to buy only good quality.

Landowner sensitization and training

In most cases there is no strict distinction between harvester and landowner, as harvesters are usually members of families who own Arnica meadows.

After identification and semi-structured interview surveys in 2006 (see socio-economic research section above), a total of 150 landowners were trained and meadow management manuals provided (see Appendix 15 in Annex 1).

A summary poster was also produced and as with the harvester poster is posted in the project field centre (Ecoherba office), drier and was displayed at the annual summer fair.

5. Project Impacts

The project has certainly generated a lot of interest in the Romanian conservation community and MAP industry, but also more internationally. WWF-DCP has already adopted and adapted the approach to participatory working and letting local organisations for resource management develop. USAMV, through the project advisor Prof. Rotar, and the local co-ordinator Florin Pacurar, are now focusing their research much more on grassland management for biodiversity rather than purely production. Several MAP trading and manufacturing companies have regularly attended meetings and field trips organised by the project team and shown keen interest to learn about the need for more sustainable production and trade and entering ethical markets. They will be ahead of their competitors when more demand for organic and sustainably produced MAPs is likely to develop over the coming years.

Internationally, much interest has been shown in the research to develop appropriate resource assessment methods (see no. of conference presentation on subject), as the latter is always the weak part in any effort to establish if the harvesting of a natural resource is sustainable over time. It is a vital piece of information that should be known before any commercial harvesting of a species for trade takes place. However, it is time-consuming to establish and very few commercial operators are willing to pay for it, as the reticence of even our company partner Weleda has shown. It is difficult to strike a balance between having sufficiently precise information on and monitoring of the resource and cost-effectiveness. However, it is generally accepted amongst many MAP experts that MAP resources are sold too cheaply.

This project was also seen as a model to be tested for the ISSC-MAP implementation, but the funding restrictions have not allowed this. A lot of interest has also been generated, because it is one of the few examples where a connection from source to shelf was being made by the same project, i.e. from sustainable harvesting, over local value-adding to trading with a reputable manufacturing company.

In the attempt to develop a model the project has also confirmed the difficulty small producers have in setting up a sustainable, yet profitable operation in the absence of starting capital, subsidies (e.g. agri-environment schemes), economies of scale (e.g., in drying, transporting), capacity and skills (e.g., marketing, business administration). Without external support from either government agencies or NGOs such attempts are likely to be rare. Being part of a wider regional sustainable development strategy is also vital to embed one particular effort of sustainable-use and trade in a wider effort to promote regional tourism and local brand development for local produce (e.g., similar to the parc naturel regionaux movement in France; <http://www.parc-naturels-regionaux.tm.fr/en/parc.UK2.pdf>).

Through the interaction with the MBA-team, it has been highlighted that external control over the maintenance of ethical standards is very difficult to achieve unless an independent agency maintains a stake in the business. WWF as a charity was not allowed to do that.

The project has done a great deal to improve the relationship between PNA and the community. At the beginning the community was very hostile towards the park. We soon realised that this was based on mis-information. Local people thought they are now part of a national park and will be severely restricted in their normal activities. In fact, PNA is a 'Natural Park', which is equivalent to IUCN V, a landscape-protection area. Only the ice-cave and some other special cave features are more strictly protected. The only issue that is still sensitive, as it is strictly speaking illegal, is the logging of local state forest.

Despite obvious difficulties associated with discontinuation of funds, the members of Ecoflora and Ecoherba are showing great determination to make the enterprise work. This is a refreshing attitude and stands in contrast to the usual donor dependant attitudes displayed in many conservation and development projects.

Improvement of local capacity for biodiversity work

RP through involvement with the project and being responsible for getting together the documentation for certification has now been offered a position as the Romania contact point for IMO Switzerland. RP and MK are now also involved as trainers in the EuropeAid Project/122572/D/SER/RO 'Vocational Training aimed at Developing Competences in the Field of Agricultural Methods to Protect the Environment and Maintain the Rural Landscape' during which 260 farmers will be trained in more

biodiversity friendly grassland management for dairy and meat production, but also for other products such as MAPs. The Arnica project is used as a case study. One of the main objectives of these courses is also to teach farmers how to apply for agro-environment scheme subsidies.

HP, who has always been the most independent and mature member of the team, has set up his own conservation and education NGO. Apart from other work this NGO has won the contract to manage three Romanian Nature Reserves. He now also works with WWF DCP on a number of projects including nature education for youths. FP, the local co-ordinator, continues to be closely involved with Ecoherba/Ecoherba as a consultant to the business and a member of the association. He provides continuity and support in the absence of further funding and technical support from the project. As mentioned above, AM has gone on to study towards a PhD directly related to the project area. MC, is working as a researcher on the USAMV agricultural research station.

Dana Bate is probably the most out-standing capacity building success as a result of the project. As a young, female school teacher she has an important role in the community. However, she is quite shy and the only woman amongst local men involved with the project. It was therefore, highly encouraging that she should be taking on much responsibility, first in social surveys, then as advisory committee member and then as the CEO of Ecoherba. She generally, believes that efforts of creating employment and income generation locally is one of the main ways to encourage young people to stay in the area.

There has been great collaboration and awareness raising with schools in the wider area of the project. The government agency in charge of issuing the collection permits (Institute of Biological Research, Cluj-Napoca) and Romanian Academy of Sciences, have shown great support and interest in the approaches of the project, particularly in Resource assessment. Excellent collaboration took place between the village council of Garda de Sus through the major V. Marin. Without his support it would have been very difficult to gain the confidence of the local community.

The collaboration between WWF-UK and WWF-DCP was hampered by the lack of money made available to WWF-DCP and personality issues between the BM the UK project officer and MM the project supervisor. However, extensive collaboration between the project officer and USAMV staff, especially FP (local co-ordinator) and Professor Rotar have taken place and are set to continue into the future (e.g., plan to develop joint EC proposal)

The harvesters have directly benefited from better prices (c. 3 times the normal market price) for sustainably collected Arnica, as well as guaranteed purchase of collected material (as per instructions from Ecoherba). If these price-levels can be maintained in future, the collection of Arnica for Ecoherba will be an attractive additional income source. Provided that Ecoherba stays in business and produces profit, Arnica meadow owners will also benefit through some form of compensation payment. This system could unfortunately not yet be established because Ecoherba is still too new and has so far not been profitable. Furthermore, clear land-ownership needs to be established first to allow fair distribution of compensation payments. Once the current land registration process is complete, it should be relatively easy to make these payments.

6. Project Outputs

Annex 9 is a folder on the accompanying CD that contains project publications (not comprehensive; see Appendix III for full list) and Annex 10 is a folder containing some of the project presentation at conferences, workshops, schools and at the national workshop presenting results. Annex 13 contains Romanian newspaper articles.

Additional outputs achieved:

with no output number:

Research:

- One of the early case studies in Romania on the development of a social enterprise, based on the processing and marketing of local natural resources (i.e., Arnica). One of the research outputs of this was the business plan produced by 5 MBA students of Said Business School, Oxford University (see Annex 11).
- Organic wildcrafting certification by IMO, Switzerland (Annex 6) was carried out as another form of value-adding and external control.
- Pilot study for the development of International Standards for the wild Collection of MAP, ISSC-MAP certification by IMO, Switzerland (Annex 6).

Dissemination:

- Project T-shirts were printed in 2005 and reordered in 2006. They were a big success with children and adults alike and gave the project a real identity in the project area.
- The web-site was seen to be very good dissemination tool and was launched in 2005. However, it was not updated and towards the end the project outputs were not uploaded as and when they became available, i.e., it could have been more effectively used.
- The project flyer was produced by 2005 and extensively distributed (Annex 12)
- project site features as a day in the itinerary of an eco-tourism package to see and experience the culture and nature of Apuseni. Please see website

http://www.apusenixperience.ro/index.php?option=com_content&task=view&id=71&Itemid=80

with output no:

Training:

Output 2:

- 1 additional master thesis and 2 PhDs started under the project.

Output 6a & 7:

- An especially designed Social survey skill course by Dr Paul Jepson, Conservation Direct, UK (see Annex 5), built the capacity of the team, community members, park staff and government officials with course handbook.

Dissemination

Output 11 a & b:

- 3 peer reviewed papers were published which is 2 more than anticipated. This largely due to the efforts made by WK in submitting papers about the project early on. This has been very effective in making the work known, particularly in the MAP conservation and use circles (Annex 9).
- 3 non-peer reviewed, short articles were published and none of which were planned

Output 14b:

As can be seen from Appendix II, the project team were very active in presenting the project at international conferences, international, national and local workshops and seminars as well as more informal meetings and workshop (Annex 10).

The development of a number of standard project presentation for different audiences (school children, academics, government agencies) at the beginning of the project has allowed project team members to react quickly to opportunities and requests for a presentation. Conference presentations were more carefully crafted and based on the results of the project.

The project is now widely known in academic circles in Romania and Western Europa, as well as with the MAP traders, manufacturing companies and retailers.

After the end of the project the project will be presented at two more international conferences, still used as the pilot study for ISSC map (even if not in the implementation study now) and used by team members in their work (e.g., by RP and MK as examples in seminars to farmers on grassland management for biodiversity and income; WWF-DCP in project design and implementation).

Outputs partly achieved:

Research:

No output no:

- As mentioned previously, the socio-economic research could have been more in-depth and professionally done. However, as explained above we had access to very good data (Auch, 2006) and good local knowledge within the team plus major efforts towards the end of the project to collect the necessary data related to Arnica landowners, in particular. All in all it was sufficient for the purpose of the project and the work.

Dissemination:

Output 15A:

- Only 3 instead of 5 local/national newspaper/magazine articles were published: this was partly the case because we had less communication support from WWF DCP towards the end of the project because the communications officer was promoted and not properly replaced.
-

7. Project Expenditure

Current Year's Costs	2006/7 Grant	Claimed so far (2006/7)	Expenditure this period	Remainder for 2006/7

In the final year, the staff cost exceeded the budget considerably, because due to an oversight the salary increases agreed in 2005 were not taken into account. Luckily, an underspent under conferences and seminars (e.g., the national workshop was cheaper than anticipated) and other small underspents allowed the budget to be balanced.

8. Project Operation and Partnerships

We had three main local partners. These were the host country partner WWF-DCP and USAMV. USAMV through the contribution of the local coordinator, USAMV students and Prof. Rotar as advisor was by far the most active partners. This is not surprising because WWF-DCP was not given sufficient funds to provide more than the minimum of input. As previously mentioned this was a mistake at the project design stage. Nevertheless, WWF-DCP worked over and above their compensation levels, in particular with regard to the financial administration of this project.

The commune of GdS, through the strong commitment and participation of the mayor, was also a crucial and a very active partner in the project and very much helped to shape the implementation through direct support and advice.

The PNA administration, particularly through the Director, Alin Mos, was highly supportive of the project and in actual fact highly grateful for the awareness raising and direct contribution to data collection (botanical) and development of management plan (Arnica management plan aspects taken up into the Park management plan draft) made. This is particularly the case, as the park is highly under-resourced and faced with the difficult challenge to become fully operational.

Very little collaboration with the one other Darwin project existed and no consultation with the host country Biodiversity Strategy office took place. A member of the Darwin project 'Youth Participation in Protected Area Management in Rodna National Park' participated in our National workshop on Thursday 14th of March 2007.

International partners:

Five main international partners participated/contributed to the project activities:

- WWF-Germany provided the funding for for ISSC-MAP certification;
- Weleda Germany entered into a 5-year company partnership agreement, which included an interest free loan to help finance the drying house and to pre-finance the annual harvest in order to pay collectors.
- Said Business School to provide the MBA student consultancy that lead to the business plan development and design of the main dryer
- IMO Swiss certification agency conducted the organic certification and ISSC-MAP.
- GTZ through its 'Apuseni Regional Development Project' and Dr H. Jakob provided much invaluable advice on the foundation of the business and associations related to the agricultural/ natural resource sector.

The partnership between USAMV and WWF DCP Romania is not likely to be very active unless WWF DCP Romania decides and finds funding to work in the wider area of Apuseni and on wider conservation and development issues (e.g. logging and forest management). However, the partnership between USAMV and Ecoherba/Ecoflora and the PNA is likely to stay strong provided that Dr Florin Pacurar remains at USAMV. WWF DCP Romania as an organisation is fully involved in local biodiversity strategy processes. Without community participation and the commitment of directors of Ecoherba and members of Ecoflora the legacy of the work can not come to fruition. Considering that most of the Ecoherba directors and members of Ecoflora are highly committed to the welfare and conservation of the local area it is highly likely that they will do their utmost for Ecoherba and Ecoflora to succeed to garner more support from the community. As mentioned previously, to make the business successful however is not an easy task when key investment is no longer forthcoming and key expertise (e.g. in marketing) is not available locally. The involvement of the private sector is essential for future success; i.e., companies such as Weleda buying dried Arnica and in future maybe dried mushrooms, other herbs and fruits.

The commune of GdS remain highly committed and are inextricably linked to Ecoherba/Ecoflora through membership. Their collaboration with USAMV is a long-term one.

9. Monitoring and Evaluation, Lesson learning

Methods of monitoring

Annual review workshops, bi-monthly reports and quarterly operational meetings (since 2005) were the main M & E tools upon which the project leader in co-ordination with the project team made decision on project progress and interventions toward the delivery of the required outputs, but also to seize opportunities that arose (e.g. MBA student consultancy for business planning; ISSC-MAP pilot certification). Especially WK held frequent telephone conversations with all team members to receive an up-date on progress and to help with technical, team and administrative issues. All major meetings were documented by minutes or reports when the meetings/workshops were more major. Annual workplans helped to monitor progress and formed a reminder on the deliverables under the project. They were very useful and BM tried to reinforce them through monthly team workplans. These sometimes seemed to be a slight 'overkill', i.e., the balance between compiling and checking them and doing the work did not always seem right.

Ecological baseline information:

It was necessary to first assess how much of the Arnica resource was present in the project area in order to calculate what the sustainable off-take might be (see section 4). This took until the last year of the project.

Social and economic baseline information:

A considerable amount of information was already available through a previous large-scale project called 'Proiect Apuseni' from the University of Freiburg, Germany (Ruşdea *et al.*, 2005; Auch, 2006). This project was tasked to conduct socio-economic research to establish the number, social status and age-structure of harvesters and landowners of Arnica meadows. As described in section 4 we mostly concentrated on a detailed survey of Arnica landowners.

Indicators at purpose level:

The indicators '30% of farmers GdS committed to long-term traditional habitat management by yr 3' and '40% of harvesters at GdS adopt sustainable harvest practices by yr 3', turned out to be very difficult to measure and to a large extent inappropriate.

Although harvesters had to sign a contract to comply with the organic wildcrafting standard and thus also with our harvester manual, this contract is only valid for the specific season. 19 families signed that contract. As it turns out, a better measure is the rejection rate of flowers harvested as this indicates very well whether harvesters are harvesting only fully opened and fresh flowers. If this is then combined with post-harvest monitoring one knows how intensively the flowers have been harvested. The rejection rate was reduced from 15% in 2005 to 5% in 2006, which is also an indicator of the training success. Also if Ecoherba remains to be able to pay the best price the harvesters have shown to be willing to follow the stricter quality and sustainability rules rather than get paid less and sell to other traders.

With regard to land owners, we can not have any guarantee of the commitment to maintain sustainable harvesting practice. We have trained the majority of Arnica landowners and handed out the manual, but whether they are able to maintain that traditional management depends on several, often inter-linking factors. The main ones are (i) age, i.e., if the farmer gets too old he/she can not manage the arduous task of mowing and haying, especially if the younger generation has left the village. (ii) A perceived need for intensification: if the farmer wants to produce more meat and milk he needs more hay, which means the need to fertilise the meadows more; (iii) if the farmer decides to abandon some meadows or leave the village completely then meadow will return to scrub and forest.

Evaluation:

There has been no formal internal nor external evaluation. No funding was set aside or has separately been made available for this. At the final review workshop the local coordinator (FP) suggested that it would have been good to have had a mid-term external evaluation. His comment arose partly out of the frustration of the internal team conflicts and the feeling that an external view could have helped to depersonalise the conflict and focus people on the objectives of the project.

Lessons:

It soon became evident that the project management structure has some deficits. The main problem is that not enough time and funds were available for the project manager from WWF-DCP, and although MM was dedicated to the project and supported the local project team, whenever possible, the project officer provided much more guidance to the local project team than the project manager, without having, in theory, substantial management tasks assigned. In reality, however, the project officer carried out the day-to-day management of the project.

Besides personality problems as indicated above, there had been a feeling of 'foreign intervention' which has been voiced by several members of the project team. This problem has been addressed by the project leader (WK) through strengthening the position of the local project team so that more decisions can be made locally. This only had a short effect until the management defaulted back to the project officer. More care needs to be taken that local experts are consulted for local or national questions whenever possible. External and UK expertise is of course, very valuable, but needs to be balanced with local expertise.

The main lesson learnt from these deficits is that it may be beneficial for similar projects to have a stronger local management from the beginning. The title 'project officer' is obviously misleading and has been confusing to most; 'technical advisor' may be a more realistic term.

On a technical level, the project achievements were significant. Capacity building on various levels has been very successful. The concept of sustainable Arnica harvesting and its potential benefits have been disseminated widely and has been largely understood and implemented. The capacity building of 7 young professional academics from Cluj has been highly successful and the progress in performance and in actively taking over more responsibilities within the project is very encouraging, in particular since most students have been brought up in an environment which supports order and obedience rather than individual initiative and open discussion. All local project team members felt that they have learned a lot during their involvement in the Arnica project. Nevertheless, it is noteworthy that the analytical capabilities of the young professionals in comparison to Western European standards are still low, which still seems to be a reflection of the prevailing system of higher education in Romania.

The early collaboration with Dr Jakob of GTZ was seen as very important by FP. He had long years of experience in setting up associations and community-run businesses. His advice was taken on board and was very helpful.

The concept of a social enterprise has been very novel to the team and the local community. It required considerable explanation by SFS and Dr Paul Jepson, who taught a short course on social surveying techniques but also has expertise on social enterprise development for conservation.

Realistic business planning was difficult to get started. MK was to lead on this aspect, because he was studying for a business related degree, with the help of the other team members but nothing was produced. This was partly due to the still unclear business structure, but also because MK did not seem to know where to start. SFS felt that only with the 'foreign intervention' of the MBA team the local team were pushed to work on the issue and provide the relevant information. Again the analysis was done by the MBA team. Subsequent requests by SFS to up-date the business plan and the financial modelling with the real figures of year 2 and year 3 were never carried out. Thus profitability calculations on 'real' figures were never produced. An important lesson is that if a project has a business element to start the business planning very early on and to buy-in relevant expertise if not available within the team. That is if this expertise is available; we found that it was difficult to get Romanian expertise because the local expert had a problem with understanding the social enterprise context.

The SBS business plan has shown that profitability from dried Arnica sale alone is very low and can only be achieved by 2008 provided prices and estimate harvest levels remain the same.. The question there is, should we have abandoned the work at that point or be optimistic and say that with diversification and more value adding combined with efforts to reduce costs this can be a viable enterprise?

On a very positive note: the people involved in the business and the association (even if very few members as yet) seem highly committed to the social if not necessarily the conservation cause of the enterprise. The head master of the school, the mayor, the local pension owner and the teacher Dana Bate, who is Ecoherba's CEO all feel strongly that setting an example for business and employment generation based on the local resources can contribute to reducing the out-migration of young people from the area. Out-migration is the greatest threat to the maintenance of this bio-diverse cultural landscape. Many of the members are even willing to invest their own resources until the business is able to turn a profit. The assessment of the headmaster was that the Arnica project was pioneering, teaching members of the community lots of new skills especially on the social side. He feels that the business can give hope if they succeed to make it work. Him and the representatives present at the final review workshop made it clear to us that they are willing to take on the responsibility, which is refreshingly different from the usual donor-dependent attitude in many development/conservation projects.

Our conclusion is that the incentive from earning some more money through the sale of Arnica and its products and hopefully other natural-resource-based products will go some way to help maintain the traditional management system. However, unless this is combined with a wider regional development scheme that includes substantial environmental subsidies similar to what is being done in the Swiss Alps and through sensitively managed agro-environment scheme as well as eco-tourism promotion and capacity building in direct marketing, we are likely to lose these traditional systems. Overall, it has been very encouraging to see commitment by key individuals in the community. These 'opinion leaders' have certainly understood the sustainable-use messages and the emphasis on the value of a traditional landscape for conservation as well as social, cultural and touristic value. They are likely to pass on and re-inforce these messages in their own families with friends, school children (the teachers) and community members (major and priest).

10. Actions taken in response to annual report reviews (if applicable)

We received review comments only after year 1. The comments were discussed in the project team and responses were collated by the team and are given below.

Specific actions taken:

1. Concerns were raised by the reviewer that the personality conflicts between the project officer and the local project team may re-surface despite actions by the project leader, at end of year 1, to de-personalise issues, focus the team on what the project is trying to achieve, and to explain the complexity of the unfortunate management structure. The latter resulted in too much management responsibility being placed on Dr Michler, the project officer and not sufficient management support from Maria Mihul of WWF DCP, who did not enough time to devote to project and for whom not enough funding was made available within this project.

As detailed in the year 2 report tensions did indeed resurface and were never totally solved throughout the life of the project. After the year 2 review Annual review workshop in February 2006, WK as project leader (SFS on maternity leave), tried to strengthen the position of the local project team, increase the responsibility of the local project co-ordinator and appealing to all parties for immediate notification to the project leader of unclear or unresolved issues. This resulted in better relations and greater team spirit during the ensuing month, but relations did break down again towards the end of the project. Despite all these tensions, that on occasion threatened the continuation of the work, the project managed to deliver all its major outputs. I attribute this to the hard work and commitment of BM and FP and WK (April 04 – Dec 04 and Jan06 – Oct 06), who despite personal differences managed to remain

committed to the delivery of the work and the local people and local team.

2. Questions related to the status of Arnica collection within the community: Arnica collection is a semi-traditional activity in the community, i.e. it does not originate from traditional knowledge (using Arnica for primary health care, for example, has no tradition in the area), but can be interpreted as an activity for additional income generation. It is no marginal activity, because it can account for a considerable portion of the legal income of the families. Many families earn most of their income from – largely illegal – logging activities. Owing to the progressive destruction of the forests in the region the awareness of the problem is increasing within the local population. However, this will not have a substantive effect on changing the behaviour as long as many families in the area don't manage to escape poverty. Arnica won't offer a solution, but it can trigger an improvement of livelihoods if combined with other initiatives. This includes the sustainable harvesting of other NTFPs such as mushrooms (including value adding, e.g. through cutting and drying), and tourism. Besides famous sights such as the ice cave, Arnica meadows are an attractive and valuable 'good' that can be sold to hiking tourists. Their number has been increasing in the last couple of years and it is likely to increase further after Romania's access to the EU. Trading is, as mentioned in the review, a male dominated activity, but this is not exclusive. Many parts of the Romanian society, in particular in rural areas, are still rather patriarchal and hierarchical. However, this is changing. For example, the CEO of Ecoherba Ltd is Dana Bâte, a young woman from the community. On the other hand, a collectors survey showed that also men collect Arnica, although fewer than women, because most male members of the community are off to the summer pastures at Calineasa during the Arnica harvesting period .
3. Area covered and Training of Trainer: The project covers the entire area of the community of Gârda-de-Sus. Only one drier was built. Therefore, an additional collection point was established on the other side of the Arieş Valley in Biharia. In the case of this project, the TOT approach is slightly different from other projects, where a more formalised method can be chosen. The majority of collectors are children, mostly boys. The easiest way to train them was through events at the school and in the field. Most children in the hamlets where Arnica is collected can be reached through this methodology, and they spread word to others, mostly within their families. About 140 collectors have been trained that way by year 2. In year 3, 180 harvester manuals were distributed and another 150 harvester were reached through general awareness raising in the southern part of Gârda (Biharia). Formalised training through trainers wouldn't reach the main target group. In this region Arnica is almost exclusively collected by local residents. Collection by migrating workers is virtually unknown. After completion of the landowner survey, the landowners / farmers received training in Arnica meadow management in 2006.
4. Arnica ecology : In order to maintain a high level of Arnica density (which is necessary to make its harvesting economically viable without harming the population), traditional extensive mountain farming needs to be encouraged. This was an essential part of the farmers training in 2006. Extensive farming must take care that the livestock on the meadows does not exceed the capacity of the meadows, in particular as Arnica has no high tolerance of N-fertilization. On the other hand, regular grazing and haying (after the Arnica flowering season) is important to avoid high grass and, over the long term, transformation to scrubland. The results of the 2005 Arnica monitoring (including satellite image, habitat size, population densities and flowering rates) have been compiled by BM and all is documented in the management plan (Annex 1).

5. Exit strategy: The main local expectation in the project has been to achieve a higher income for Arnica harvesting / a higher price in trade. In the eyes of the local population this will be the most crucial question and decide on success or failure of the project. As with almost any business, it is unrealistic to expect that it will be profitable and financially sustainable from the first year. Already in 2006 and in the final review workshop (March 2007) with members of Ecoherba and Ecoflora present, the need to diversify into other products, add more value to Arnica (e.g. oil & tincture production) and the need to find new buyers for products was stressed as essential to achieve profitability of Ecoherba. Having the company partnership with Weleda (5-year contract to buy up to 1000kg dried Arnica and possibility of advanced payment to help pay harvesters; interest free loan to cover half the cost of the drier) guarantees a buyer for most of the Arnica that can be harvested sustainably in the region. However, the income generated from this one contract is not enough to cover costs or even turn a profit at present. Weleda needs to look at paying higher prices, as it does not even cover the cost of the organic certification and at the same time Ecoherba urgently needs other products to sell and different buyers to sell to. It is also important to find products that can be dried at different times of the year to efficiently use the drier and ideally use it during a time when people are less busy on the land (e.g. in September for the drying of ceps – *Boletus edulis*). It should also pay attention to developing products with higher value adding that can be sold to the increasing tourist market (e.g. jams, syrups, small quantities of nicely wrapped, dried arnica with instructions to make Arnica oil). Ecoherba will have a difficult time ahead, since no follow-up funds could be found for a transition period during which the sustainability of the social enterprise could have been built. However, the determination and commitment displayed by Dana Bate, CEO of Ecoherba and members of Ecoflora (e.g., Mr Stefanuz and Mr a V. Marin, the major) was encouraging. Florin Pacurar will also stay involved and is committed to helping Ecoherba and Ecoflora in the coming year, provides some hope that the business has a chance of success and therefore a chance to provide real benefit to the local community.
6. The issue of maintenance of ethical standards and avoiding the mis-use of the drier (e.g. for ‘mining’ the Arnica resource) and the project car (ownership now transferred to Ecoherba) was discussed at length with the MBA team and with the team. It would have been best to have an external body to oversee the maintenance of ethical standards, but this was not possible. WWF, for instance, is in no position to do that in the absence of a project. Thus, we need to rely on the good will of the members of Ecoherba and Ecoflora. FP’s continued involvement gives some encouragement that a moral obligation will remain. The drier ownership has been given to Ecoflora and Ecoherba will have to pay rent. Although Ecoflora has interest in the profitability of Ecoherba (40% stake), it also has members with a very strong community responsibility, who are likely to maintain a strong ethical focus.

11. Darwin Identity

- The Darwin logo was proudly displayed on the project Land Rover, which was used widely in the Apuseni Region and around Cluj-Napoca. All project posters, manuals, presentations, the web-site and any other publication had the Darwin logo displayed.
- The Darwin Initiative is now very familiar to WWF DCP Romania and if other UK collaborators can be found, is likely to be considered as a future funding source.
 - It was clearly a distinct project with a clear identity.

12. Leverage

WWF-UK provided additional Euro 2,000 to allow the importation and transfer of ownership of the Land Rover. In addition, considerable *pro bono* work was secured in connection with the business development. All the work on the business plan (except for travel to Romania) was done without charge and the architectural design was also conducted free of charge.

Dr Wolfgang Kathe (WK) worked hard with the project team to develop follow-up proposals and to discuss follow-up funding with managers at WWF-UK. Non of the smaller proposals were developed sufficiently by the local project team to be ready for funding submission. Regrettably, due to a change in strategy away from funding work in Eastern Europe, WWF-UK was not in the position to fund further work and to apply for other sources of follow-up funding.

Through WK links have been made to the ISSC-MAP process. WWF-Germany paid for the additional pilot ISSC-MAP certification in August 2006. Subsequently the Arnica project was selected for pilot implementation of the international standard. This could have started as early as autumn / winter 2006/2007, but funds could so far not be secured. It was hoped to receive financial support from Weleda for the pilot implementation, but Weleda has so far been hesitant despite years of involvement with sustainability and equity discussions with WWF-Germany and WWF-UK.

Maria Mihul, project supervisor, WWF DCP Romania suggested the inclusion of the project area in WWF's potential strategy and fundraising activities related to establishing FSC certified forest management in Romania. This information touches a sensitive issue and has not been disseminated beyond the project team and WWF. It may, however, be strategically important, because establishing sustainable logging in the area is one of the central aims of the Apuseni Natural Park; the local resistance is significant and it can only be overcome if concepts are presented in a cautious way and if the local population actively participates in the development of local implementation strategies. It will require several years.

BM has been working on the development of a large EU follow-on proposal to do landscape-level sustainable development and conservation work through the University of Freiburg. The proposal is still in the concept stage.

13. Sustainability and Legacy

The local project team except for FP, the local co-ordinator, are no longer involved in project follow-up. One of the team, RP, has secured a consultancy position with IMO who carried out the organic wildcrafting certification in Gârda de Sus. He is in charge to build up the Romanian market for IMO and is paid on a new client basis. See Section 5 'Improvement of local capacity for biodiversity work' regarding the career development of project staff.

USAMV and the community of Gârda de Sus (especially representatives of Ecoherba/Ecoflora) will continue to stay in touch and key members of the community will work with USAMV in the future. This is partly the case because USAMV has long-term research interests on meadow management there and uses it as a field trip site.

The physical resources of the project, the dryer and the car, are owned by Ecoflora and Ecoherba respectively. The issue of the ownership of the drier was discussed above. The car is an essential tool for Ecoherba to operate its business. The ownership of car was transferred to Ecoherba on the condition of upholding the ethical standards.

Maria Mihul, project supervisor, has already applied the approaches we used to working with the community and incorporating business elements in the development and fundraising for another project. BM has already had much interest expressed in the methods she developed and used to establish the sustainable yield for Arnica (resource assessment). She will present on this in September 2007 in Switzerland at the International Monitoring and Effectiveness of Nature Conservation' Conference organised by the Swiss 'Research Institute for Forest, Snow and Landscape'.

See Section 12 leverage regarding efforts to find further funding. Obviously with further funding the legacy could be improved by working on further dissemination of results and, most of all, by focusing on securing the sustainability of the social enterprise Ecoherba. After all Ecoherba and Ecoflora have been designed to be the main vehicles for management and trade of the Arnica and hopefully soon other natural resources in GdS.

14. Value for money

It has been good value for money. One of the reasons was that the core project staff worked over and above the call of duty. Barbara Michler worked on this project more or less full-time, but was only paid half-time. Similar Florin worked over and above the call of duty. Adriana Morea one of the more recent project team members also stood out in her dedication to the project despite very poor levels of pay.

Due to the extra in-kind contribution by the MBA students for business planning and the architectural services of Architecture for Humanity, much needed external input and services were provided free of charge. The project would not have had the resources to pay for these services.

Weleda's agreement to provide an interest free loan enabled the project to build a much larger dryer than initially anticipated. The GBP 10,000 funded by Darwin/WWF Match was matched by the Euro 10,000 loan to Ecoherba.

15. Appendix I: Project Contribution to Articles under the Convention on Biological Diversity (CBD)

Please complete the table below to show the extent of project contribution to the different measures for biodiversity conservation defined in the CBD Articles. This will enable us to tie Darwin projects more directly into CBD areas and to see if the underlying objective of the Darwin Initiative has been met. We have focused on CBD Articles that are most relevant to biodiversity conservation initiatives by small projects in developing countries. However, certain Articles have been omitted where they apply across the board. Where there is overlap between measures described by two different Articles, allocate the % to the most appropriate one.

Project Contribution to Articles under the Convention on Biological Diversity		
Article No./Title	Project %	Article Description
6. General Measures for Conservation & Sustainable Use		Develop national strategies that integrate conservation and sustainable use.
7. Identification and Monitoring	15	Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities that have adverse effects; maintain and organise relevant data.
8. In-situ Conservation	20	Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
9. Ex-situ Conservation		Adopt ex-situ measures to conserve and research components of biological diversity, preferably in country of origin; facilitate recovery of threatened species; regulate and manage collection of biological resources.
10. Sustainable Use of Components of Biological Diversity	15	Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
11. Incentive Measures	20	Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.

12. Research and Training	20	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).
13. Public Education and Awareness	10	Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
14. Impact Assessment and Minimizing Adverse Impacts		Introduce EIAs of appropriate projects and allow public participation; take into account environmental consequences of policies; exchange information on impacts beyond State boundaries and work to reduce hazards; promote emergency responses to hazards; examine mechanisms for re-dress of international damage.
15. Access to Genetic Resources		Whilst governments control access to their genetic resources they should also facilitate access of environmentally sound uses on mutually agreed terms; scientific research based on a country's genetic resources should ensure sharing in a fair and equitable way of results and benefits.
16. Access to and Transfer of Technology		Countries shall ensure access to technologies relevant to conservation and sustainable use of biodiversity under fair and most favourable terms to the source countries (subject to patents and intellectual property rights) and ensure the private sector facilitates such assess and joint development of technologies.
17. Exchange of Information		Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes and local knowledge
19. Bio-safety Protocol		Countries shall take legislative, administrative or policy measures to provide for the effective participation in biotechnological research activities and to ensure all practicable measures to promote and advance priority access on a fair and equitable basis, especially where they provide the genetic resources for such research.
Total %	100%	Check % = total 100

16. Appendix II Outputs

Please quantify and briefly describe all project outputs using the coding and format of the Darwin Initiative Standard Output Measures.

Code	Total to date (reduce box)	Detail (←expand box)
Training Outputs		
1a	2 registered for PhD (NOT SUBMITTED)	NOT submitted; but 2 PhD's in process as result of project. This was not initially proposed. AM on meadow management for biodiversity; AS on meadow flora of Gârda de Sus;
2	3 (one more than proposed)	3 people (one more than proposed)
3 (additional)	2	1 Diploma (Univ. Babes Bolja); 1 certificate course in Environmental management completed by RP
4a (additional)	c. 120	c. 100 trained to conduct fieldwork in monitoring, inventory and drying of Arnica
5 (more than proposed)	6 (3 more than proposed)	In total 6 people trained in field work & analysis; 3 more than proposed (Dana Bate in Arnica sustainable harvesting and business management; AM & MC in Arnica drying, purchasing, monitoring and inventory)
6a	180 harvesters; 150 landowners; 2 park staff; 6 community members; 20 project team, community, park & WWF-DCP staff;	180 harvesters received trainings in year1-3 and were given harvester manual (280 distributed in total); 150 landowners were trained in meadow management for Arnica production using the meadow management manual ; 2 park staff received training on various occasions through attendance of harvester training sessions, social survey skills etc and general close collaboration with the project; 6 community members followed the training activities of the project closely and thus are familiar with the sustainable-use and trade requirements; 20 project team members, community members, park and WWF-DCP staff attended 3-day course on Social survey skills delivered by Dr Paul Jepson, Conservation Direct.
7 (more than proposed)	2 manuals 4 posters (training) 1 training pack for harvesters operating procedures; 1 social survey skills course-book	1 sustainable-harvest manual and poster; 1 meadow management manual and poster (additional); 1 poster on drying and inventorying of Arnica; training packs for harvester training; management plan with standard operating procedures for use by Ecoherba/Ecoflora and other to conduct sustainable-use, drying and trade of Arnica according to developed procedures (see appendices of management plan.); As part of the social survey skills course participants received a course-hand book.
Research Outputs		
8 (more than proposed)	32 weeks instead of 12 (Project Officer) 9 weeks (Project leader)	32 project officer spent much more time than initially anticipated in the field to provided direct input, guidance and support; The two project leaders (SFS & WK on maternity cover) spent in total 9 weeks in the field/Cluj mostly for annual review meetings and field visits (harvesting season; organic certification visit);

Code	Total to date (reduce box)	Detail (←expand box)
9	1 Arnica management plan	1 management plan for Park Natural Apuseni and for Ecoherba/Ecoflora use (especially Operating Procedures (Ops) in Appendices)
11a	3 (2 more than planned)	1 book chapter, as result of presentation at Frontis international workshop, Wagening. One paper in the proceeding of the 13 th International Symposium of European Grassland Federation (2005). One paper in Medicinal Plant Conservation (Volume 11: 27-31, Bonn, August 2005).
11b	3 (none were planned)	3 short USAMV-bulletin publications by Michler <i>et al.</i> 2005; Morea & Michler, 2006 and Michler <i>et al.</i> 2006.;
Dissemination Outputs		
14a	1 national workshop 2 annual review and planning workshop 2 final review workshops (only 1 combined review workshop with team and key community members & park staff) additional: 1 kick-off workshop in May 2004; 1 interim planning workshop, Sept. 2004 1 field workshop for main external stakeholders	Project started with kick-off workshop, which was followed by interim planning workshop after first field season. Year 1 and year 2 had an annual review & planning workshop around Feb/March for all team members and with input from key stakeholders. These allowed work planning & had important moral building functions. In July 2005 1 National workshop was organised in March 2007 at USAMV with c. 35 participants from academy, government, park authorities, NGOs and industry; The results of project were presented and discussed by participants; it was directly followed by a final review workshop for project team & community members; we combined the team and community workshop because the key community members were closely bound to team; good feedback and lessons were provided. 1 workshop for University lecturers, herb traders & manufacturers & gov. officials in Gárda in July 2005; 1 National workshop, March 2007 1 kick-off workshop in May 2004; 1 interim planning workshop, Sept. 2004 1 field workshop for main external stakeholders

Code	Total to date (reduce box)	Detail (←expand box)
14b	<p>4 poster presentation (2 at international conferences) 5 international conferences/symposia presentations 2 international workshop presentations.</p>	<p>WK: project presentation at Frontis international workshop, Netherlands; April 2005;</p> <p>SFS and MK: Presentation on the project and supply chain research; side event of the Intern. Botanical Congress (IBC) entitled 'Sustainable supply chain management for MAPs'; July 2005; Vienna; Austria;</p> <p>FP: presentation of poster based on Paper 'Arnica Montana an endangered species and traditional medicinal plant: biodiversity and productivity of its typical grassland habitats'; 13th Intern. Occasional Symposium of the European Grassland Federation (EGF); Aug. 2005, Tartu, Estonia.</p> <p>BM: presentation of project at the 35th Annual Conference of the Ecological Society of Germany, Switzerland and Austria (GfÖ); Sept. 2005; Germany;</p> <p>WK: Presentation of project at side-event at international IFOAM conference on organic wild harvesting, May 2006; Bosnia.</p> <p>BM: presentation at 4th Intern. Conference on MAPs of SE countries, Univ. of Medicine and Pharmacy, Iasi, Romania; May 2006;</p> <p>HP: presentation at Resource Assessment for MAP international workshop organised by BfN on Isle of Vilm, Sept. 2006; Germany,</p> <p>BM: poster presentation on Arnica inventorying at International symposium 'Perspectives for the third millennium agriculture'; Oct. 2006 at USAMV, Cluj,</p> <p>Project poster displays, project team member and community member attendanc and cultural events 2 Weleda open days in Germany (2005 & 2006; attended by up to 20,000 people each year);</p> <p>to be presented: HP: Arnica case study at Planta Europa Conference, Sept 2007 in Cluj-Napoca Romania (dissemination through Planta Europa network);</p> <p>BM: will present on Arnica resource assessment at the international 'Monitoring and Effectiveness of Nature Conservation' conference of the 'Forschungsanstalt for Wald, Schnee und Landschaft', Switzerland.</p>

Code	Total to date (reduce box)	Detail (←expand box)
15a,b	1 national & 2 regional newspaper articles (instead of 5)	<p>Accent' newspaper, Alba Julia district: 'Arnica □ontana the unknown treasure from Apuseni'</p> <p>Evenimentul' (Daily Event) Transylvanian newspaper: 'Plants, faster entrance into the EU'</p>
15c	3	<p>Natural Remedy with a Snag, Oxford Times, 10th November 2006 (weekly newspaper) http://www.theoxfordtimes.net/misc/print.php?artid=1016686</p> <p>'No pain no gain' Business at Oxford; Winter 2006, p. 9 (available in print; circulation 1500) http://www.sbs.ox.ac.uk/NR/rdonlyres/843A8687-C88D-4404-A7AA-4CE28707BEA8/0/BusinessatOxfordWinter06.pdf</p> <p>Business balm for the Arnica Industry, 'Postings', Autumn 2006, p. 14. (available in print; circulation 1500) http://www.sbs.ox.ac.uk/NR/rdonlyres/06251A4B-D4D2-408F-A31B-97C3B4E19DC5/2211/SKOLLaut06single.pdf</p> <p>same article available on News web-page of Said Business School, 11 Sept. 2006 http://www.sbs.ox.ac.uk/news/archives/MBA/Business+balm+for+the+arnica+industry.htm</p>
18b, 19a,b,c	1 WWF-DCP press trip with resulting coverage;	<p>project included in WWF –DCP press trip 'Discover the Carpathian Mountains', Sept. 2004 resulted in:</p> <ul style="list-style-type: none"> • 4 minute radio feature storey on BBC Radio broadcasted (13 & 14/11/2004), • 5 min. radio feature story for Central European News Agency, Oct. 2004 • 4 min. TV news item broadcasted on BBC World News (13/11/2004) • 'Preserving a way of life in the Carpathians', Deutsche Welle International Radio (9/3/05) <p>Broadcast about the project on national radio station "Radio Romania Actualitati" (on 13 & 14. 3.05)</p>
Dissemination: No number	website	Project web-site on line since Oct. 2005; www.arnica-montana.ro

Code	Total to date (reduce box)	Detail (←expand box)
Dissemination: no number	Flyer and t-shirts	Project flyer and T-shirts produced May 2005; T-shirt big success with children and community members; all trained harvesters received a T-shirt.
Physical Outputs		
20	Estimated value (£s) of physical assets handed over to host country(s)	Pilot dryer c. Euro 5000; Euro 10,000 for dryer (other half of cost covered through loan from Weleda); £ 17,800 Land Rover handed over to Ecoherba/Ecoflora
21	Number of permanent educational/training/research facilities or organisation established	Established the company Ecoherba Ltd and the association Ecoflora Gârda de Sus;
23	Value of additional resources raised for project	Additional GBP 2000 from WWF-UK in 2007; WWF-Germany paid for ISSC-MAP certification; Euro 10,000 loan from Weleda to build dryer;
No output no.	1 company partnership	5-year company partnership contract with Weleda (with annual review) signed in 2006;

17. Appendix III: Publications

Provide full details of all publications and material that can be publicly accessed, e.g. title, name of publisher, contact details, cost. Details will be recorded on the Darwin Monitoring Website Publications Database that is currently being compiled.

Mark (*) all publications and other material that you have included with this report

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (e.g. contact address, website)	Cost £
Journal	Michler B., Kathe W., Schmitt S. Rotar I. (2004): Conservation of Eastern European Medicinal plants: Arnica montana in Romania. Bulletin USAMV-CN, Seria Agricultura, Volume 60: 228-230.	USAMV, Cluj-Napoca, Romania		
Journal	Michler Barbara, Ioan Rotar, Florin Pacurar (2006): Biodiversity and conservation of medicinal plants: a case study in the Apuseni mountains in Romania. Bulletin of the University of Agricultural sciences and veterinary medicine. S: 86-87.	USAMV, Cluj-Napoca, Romania	USAMV,	

Journal	Morea Adriana, Barbara Michler (2006): Drying of the <i>Arnica montana</i> flower heads in Apuseni mountains, county Garda. Bulletin of the University of Agricultural sciences and veterinary medicine. S: 397.	USAMV, Cluj-Napoca, Romania	USAMV	
International newsletter	Kathe, W. (2005) Sustainable sourcing of <i>Arnica montana</i> in the Apuseni Mountains (Romania): a field project	Medicinal Plant Conservation (Volume 11: 27-31, Bonn, August 2005).	http://www.iucn.org/themes/ssc/sgs/mpsg/news_download/mpc11_final_std.pdf	
Book chapter	<i>Kathe, W. (2006) Conservation of Eastern European medicinal plants: Arnica montana in Romania. In Medicinal and Aromatic Plants Agricultural, Commercial, Ecological, Legal, Pharmacological and Social Aspects Series: Wageningen UR Frontis Series , Vol. 17 Bogers, Robert J.; Craker, Lyle E.; Lange, Dagmar (Eds.) 2006, XVIII, 309 p.,</i>	Springer Verlag	http://www.springer.com/west/home/life+sci/plant+sciences?SGWID=4-10038-22-173677931-detailsPage=ppmmedia%7Ctoc	\$ 139
Conference proceeding	<i>Arnica montana</i> , an endangered species and a traditional medicinal plant: the biodiversity and productivity of its typical grasslands habitats, Michler B., Rotar, I., Pacurar, F. and Stoie A. (2005)	13th Symposium on 'Intergrating Efficient Grassland Farming and Biodiversity', Grassland Science in Europe, volume 10, pp 666	Order from: http://www.europeangrassland.org/offers.html	

University magazine & webarticle	Business balm for the Arnica Industry; Sept. 2006;	Skoll Centre of Said Business School, University of Oxford	In two different magazines and web-sites: http://www.sbs.ox.ac.uk/NR/rdonlyres/06251A4B-D4D2-408F-A31B-97C3B4E19DC5/2211/SKOLLaut06single.pdf (see page 14; ' Postings ' available in print; circulation 1500) also under http://www.sbs.ox.ac.uk/news/archives/MBA/Business+balm+for+the+arnica+industry.htm	
University magazine and web-article	No pain no gain (effectively same article as above)	Said Business School, University of Oxford	http://www.sbs.ox.ac.uk/NR/rdonlyres/843A8687-C88D-4404-A7AA-4CE28707BEA8/0/BusinessatOxfordWinter06.pdf (see page 9; Business at Oxford available in print; circulation 1500)	
Oxford Times weekly newspaper	Natural remedy with a snag by Maggie Hartford; 10 th Nov. 2006	Oxford Times	http://www.theoxfordtimes.net/misc/print.php?artid=1016686	
Newsletter (in Spanish & Catalan)	Conservación de plantas medicinales del este de Europa: Arnica Montana en Rumania	Bulletin especial de plantes aromatiques	Not known; see Annex publication for scanned copy.	

18. Appendix IV: Darwin Contacts

To assist us with future evaluation work and feedback on your report, please provide contact details below.

Project Title	Conservation of Eastern European medicinal plants: <i>Arnica montana</i> in Romania.
Ref. No.	162/13020
UK Leader Details	
Name	Dr Susanne Schmitt
Role within Darwin Project	Project leader
Address	WWF-UK, Panda House, Weyside Park, Godalming GU7 1XR
Phone	
Fax	
Email	
Other UK Contact (if relevant)	
Name	Dr Barbara Michler
Role within Darwin Project	Project Officer
Address	Forchheimerweg 46, 91 341 Roettenbach
Phone	
Fax	
Email	
Partner 1	
Name	Maria Mihul
Organisation	WWF-DCP Romania
Role within Darwin Project	Project supervisor
Address	Dimitrie Cantemir Bdv., No 2 Bl.P3, Sc.2, Et.3, Ap.32 Sector 4, Bucharest, RO-040241
Fax	
Email	
Partner 2 (if relevant)	
Name	Dr Florin Pacurar
Organisation	USAMV
Role within Darwin Project	Local Co-ordinator
Address	str. Calea Mănăştur, nr. 3, Cluj Napoca 400372, jud. Cluj.
Tel.	
Email	

19. Appendix V: Logical framework

<i>Project summary</i>	<i>Measurable indicators</i>	<i>Means of verification</i>	<i>Important assumptions</i>
<p>Goal:</p> <p>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve</p> <ul style="list-style-type: none"> • the conservation of biological diversity, • the sustainable use of its components, and • the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources 			
<p>Purpose</p> <p>To develop a model for the sustainable production and trade of <i>Arnica montana</i> resulting in benefits for biodiversity and livelihoods; the principles of which can be used to inform the development of conservation approaches and methodologies for other endangered medicinal and aromatic plants and their habitats.</p>	<p>Association at GdS (RMTA) able to secure conservation & increased livelihood (e.g. income) by yr 3; appropriate agreement with company</p> <p>30% of farmers at GdS commit to long-term traditional habitat management by yr 3</p> <p>40% of harvesters at GdS adopt sustainable harvest practices by yr 3</p> <p>Model documented (incl. biodiversity & social aspects & sust. sourcing guidelines), disseminated & considered useful by yr 3</p>	<p>Records of RMTA & interviews with members; inspection company agreement & interview</p> <p>Implementation agreements between farmers & RMTA; monitoring of farmers' practices</p> <p>Agreements with RMTA; monitoring data & vegetation sampling</p> <p>Inspect documentation (incl. sust. sourcing guidel. & distribution records), recipient feedback</p>	<p>Effective structure agreed in community, able to make agreements, ensure fair distrib. of benefits & settle disputes</p> <p>Farmers see advantages of trad. management over other options</p> <p>Monitoring system for quotas exists & can be used by harvesters</p> <p>Available evidence allows principles of model to be identified</p>

<p>Outputs</p> <p>RMTA founded & effective at GdS (incl. harvesters, landowners, park staff)</p> <p><i>Arnica</i> management plan written, accepted & implemented</p> <p>Harvesters & farmers trained in sustainable harvest, habitat management & drying</p> <p>RMTA/company agreement based on sustainable sourcing guidelines</p> <p>Awareness raised on benefits of sustainable harvest of MAP among harvesters, farmers, government agencies & academics</p>	<p>Association exists by yr 2 & achieves objectives</p> <p>Plan written, incl. setting of annual quotas, by yr 3</p> <p>Training conducted & manual disseminated to 200 harvesters & 300 farmers by yr 2; drying facilities installed & tested by yr 3</p> <p>Sourcing guidelines exist (draft yr 2); agreement signed by yr 3; final guidelines by yr 3</p> <p>15 local meetings (incl. school & church events); min. 1 national workshop, 2 conferences, numerous media contributions</p>	<p>Registration of association; minutes of meetings; interviews</p> <p>Management plan exists, known & respected (e.g. compl. with quotas)</p> <p>Manual; training records; inspection of equipment</p> <p>Document; inspection of agreement, interviews</p> <p>Interviews in communities, posters, leaflets, newspaper cuttings; radio/TV cover, peer-reviewed paper submitted</p>	<p>Community able to create effective org to address internal concerns; have authority & bargain with external parties. Plan agreed by RMTA & park authority; understood by community</p> <p>Ability to evolve harvest, management & drying systems that are appropriate</p> <p>Draft guidelines acceptable; suitable company willing to participate</p> <p>Right media & messages identified for different audiences</p>
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<i>Activities</i>	Activity Milestones (Summary of Project Implementation Timetable)
Research	Participatory research on trade chains (yr 1&2), ecological sustainability & link to traditional farm management (yr 1 & 2), socio-economic & cultural context (yr 1& 2)
Sensitisation, training & capacity building at field site	Sensitisation of 200 harvesters, 300 farmers/landowners, park staff, traders & companies by Mar 05; training of harvesters & farmers in sustainable harvest & management practices (completed by Sept. 06); capacity building of research officers (incl. 2 qualifications to Masters level by yr 2) & project staff (yr 1-3); 2 thematic training events per yr; 2 posters (Dec 04 & Dec 05)
Establishment of institutions & partnerships	Formation of local project advisory group (incl. project staff, key local community members, priest & park representative) by Aug. 04; design & development of RMTA by Dec. 05; company/RMTA partnership agreement(s) negotiated & tested by Jan. 07
Development of key documents	Producer manual (incl. drying & storing), draft & testing by Aug. 05; draft sust. sourcing guidelines for companies/ traders, draft by Nov. 05 ; <i>Arnica</i> management plan draft (Oct 05), finalised (Oct 06); case study Jan 07; 1 peer- reviewed paper submitted (Mar 07)
Meetings & workshops	1 project initiation wkshop (Apr. 04); 2 annual review & planning workshops (Mar 05 & 06); 5 local community wkshops/events per yr (incl. training & outreach, school, church & market events); 1 national workshop to discuss sustainable management & trade model for <i>Arnica</i> & other MAP; 1 final project review & wkshop with project team (Feb 07); 1 final review & wkshop with RMTA, community & park staff (Feb 07)
Equipment purchase & construction	1 4WD purchased (April 04); 1 demonstration t plant drying house & equipment installed (yr 2); tested & adapted drying house (Aug 06);
Awareness raising	2 conferences and at least 4 workshops attended (yr 1-3); press releases in host country (5) & UK (2); radio interviews/features in host country (2) & UK (2) and local TV programme/feature (1); 1 project leaflet produced

<p>Outputs</p> <p>RMTA founded & effective at GdS (incl. harvesters, landowners, park staff)</p> <p><i>Arnica</i> management plan written, accepted & implemented</p> <p>Harvesters & farmers trained in sustainable harvest, habitat management & drying</p> <p>RMTA/company agreement based on sustainable sourcing guidelines</p> <p>Awareness raised on benefits of sustainable harvest of MAP among harvesters, farmers, government agencies & academics</p>	<p>Association exists by yr 2 & achieves objectives</p> <p>Plan written, incl. setting of annual quotas, by yr 3</p> <p>Training conducted & manual disseminated to 200 harvesters & 300 farmers by yr 2; drying facilities installed & tested by yr 3</p> <p>Sourcing guidelines exist (draft yr 2); agreement signed by yr 3; final guidelines by yr 3</p> <p>15 local meetings (incl. school & church events); min. 1 national workshop, 2 conferences, numerous media contributions</p>	<p>Registration of association; minutes of meetings; interviews</p> <p>Management plan exists, known & respected (e.g. compl. with quotas)</p> <p>Manual; training records; inspection of equipment</p> <p>Document; inspection of agreement, interviews</p> <p>Interviews in communities, posters, leaflets, newspaper cuttings; radio/TV cover, peer-reviewed paper submitted</p>	<p>Community able to create effective org to address internal concerns; have authority & bargain with external parties. Plan agreed by RMTA & park authority; understood by community</p> <p>Ability to evolve harvest, management & drying systems that are appropriate</p> <p>Draft guidelines acceptable; suitable company willing to participate</p> <p>Right media & messages identified for different audiences</p>
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Activities	Activity Milestones (Summary of Project Implementation Timetable)
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Appendix VI: References

MICHLER, B. & REIF, A. (2003) Ecology, value and sustainable use of medicinal plants in the Apuseni Mountains: The case Study of *Arnica montana*.-Buletinul USAMV-CN (Bul.Univ.St. Agr.Med.Vet.Cluj Napoca), Ser.Agricultura, 55-56: 214.

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KATHE, W., HONNEF, S., & HEYM, A. (2003): Medicinal and Aromatic Plants in Albania, Bosnia-Herzegovina, Bulgaria, Croatia and Romania, *BfN-Skripten*, **91**: 200 pp.; Bonn and Vilm.

RUȘDEA, E., REIF, A., POVARA, I. & KONOLD, W. (Ed.) (2005): Perspektiven für eine traditionelle Kulturlandschaft in Osteuropa. Ergebnisse eines inter- und transdisziplinären, partizipativen Forschungsprojektes in Osteuropa. Culterra **34**, 401 pp. + Annex.

Appendix VII: List of Annexes

The relevant files for the Annexes are provided on a CD. This CD will also include other project related documents, publications and photos. Should anything in particular be missing please contact the project leader.

Annex 1: Arnica Management plan

Annex 2: Klemens, M. (2007) Research on trade with Arnica montana L. in Romania. A Value Chain Approach

Annex 3: Weleda –Ecoherba partnership agreement/contract.

Annex 4: Lange, D. & van den Berg-Stein, S. Analysis of the trade and market of Arnica montana in Western Europe focusing on Germany; Research Report, March 2006

Annex 5: Social-survey skills presentation/course hand book, Dr Paul Jepson, Conservation Direct.

Annex 6: Organic wildcrafting certification and ISSC MAP assessment documents (IMO)

Annex 7: Ecoflora statutes

Annex 8: Master thesis abstract, Razvan Popa.

Annex 9: Project publications

Annex 10: Presentations given

Annex 11: Business plan by MBA students Said Business School.

Annex 12: Project flyer

Annex 13: Romanian news paper article

Annex 14: selection of Project photos

Appendix VIII: Acronyms

AM	-	Adriana Morea (local project team member)
BM	-	Barbara Michler (project officer)
CITES	-	Convention on International Trade in Endangered Species
EC	-	European Commission
EGF	-	European Grassland Federation
EU	-	European Union
FP	-	Florin Pacurar (local project co-ordinator)
FSC	-	Forest Stewardship Council
GdS	-	Garda-de-Sus
HP	-	Horatiu Popa (local project team member)
IBC	-	International Botanical Congress
IFOAM	-	International Federation of the Organic Agriculture Movements
IMO	-	Institute for Market Ecology (certification body)
IUCN	-	The World Conservation Union
MAP	-	Medicinal and Aromatic Plants
MC	-	Mona Cosma (local project team member)
MK	-	Michael Klemens (local project team member)
MM	-	Maria Mihul (project manager)
NGO	-	Non-governmental Organisation
NTFP	-	Non-Timber Forest Products
RMTO	-	Resource Management and Trade Organisation
RP	-	Razvan Popa (local project team member)
SBS	-	Saïd Business School (Oxford)
SFS	-	Susanne Schmitt (project leader)
TOT	-	Training of Trainers
TRAFFIC	-	WWF / IUCN Wildlife Trade Programme
UBB	-	Universitatea Babeş-Bolyai (Cluj)
USAMV	-	University of Agricultural Science and Veterinary Medicine (Cluj)
WWF	-	World Wide Fund for Nature
WK	-	Wolfgang Kathe (interim project leader April –Dec. 04; Jan 06 – Oct. 06)