ALL ABOUT AHT GROUP

No. 53, June 2016

Climate Change Adaptation and Mitigation Strategies

At the start of the 21st Century, the world is facing mounting pressure on the environment. In many countries the natural resource base is being undermined by overexploitation and land use changes, and environmental degradation is threatening sustainable development aspirations around the world. Climate change however undoubtedly remains the major challenge the global community faces in the 21st century. Rising temperatures, changing rainfall patterns, and increasingly common extreme weather events are just some of the manifestations of a globally changing climate.

Effective adaptation and mitigation strategies and measures have the potential to foster a more environmentally sound and socially equitable economic development. Climate change adaptation describes actions in response to the effects of climate change impacts. It reduces vulnerability, minimises threats and can maximise the opportunities that may be presented by climate change. Climate change mitigation, the reduction of greenhouse gases (GHGs), can be achieved through investments in modern low-carbon technologies and improved environmental management. Adaptation has emerged as a priority in development and economic planning. This is reflected in the international community's increased financial commitments to adaptation efforts. A steadily increasing number of governments have elaborated adaptation plans and policies at various levels and are integrating climate change considerations into broader development plans.

(continued on page 3)

Dr. Hubertus Schneider
Managing Director

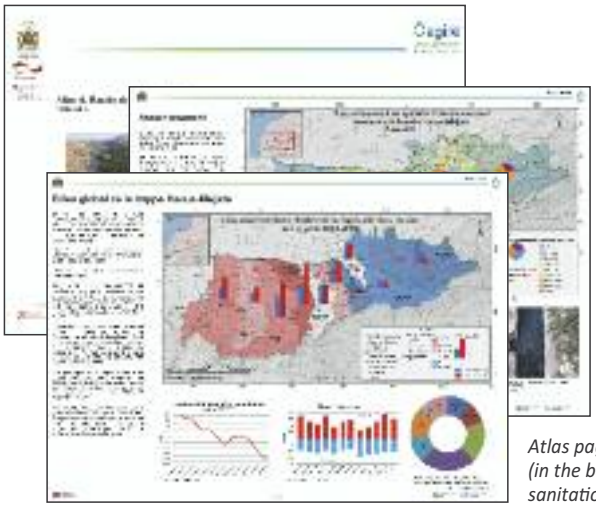
Dear reader!
Welcome to the latest edition of *All About AHT Group*!
Our cover story in this issue deals with climate change adaptation and mitigation strategies.
Global climate change is a controversially debated topic - both politically and in society. International political commitment has once again been made at the Paris Climate Change Conference, COP21, in December 2015 with the first legally binding global climate deal being formulated. While the ratification process is still ongoing, the Paris Agreement lays the foundation for a global action plan by committing to a significant reduction of greenhouse gases and by limiting global warming to well below 2°C.
Governments and donor organizations worldwide have laid out large programs to mitigate climate change and adapt to its impacts. AHT has been providing technical assistance to face these global challenges for years. On the following pages we present a selection of our most important projects dealing with climate change in the fields of water, water resources management, nature conservation, communal infrastructure, including all aspects of governance.

We hope you enjoy our newsletter.

The Business Year 2015
The annual accounts of AHT GROUP AG were audited by Märkische Revision GmbH, Wirtschaftprüfungsgesellschaft. In 2015 AHT GROUP AG achieved a turnover of T€ 14.203 and an operational result of T€ 740.

The business year 2015 was marked by the high inflow of orders in the range of about T€ 30,000 that correlates to a turnover of more than two years. A major part of our growth in 2015 was in the natural resources management and bio-diversity sectors.
With this reserve on hand and the already good start in the first quarter of 2016, AHT is continuing its growing course. These positive prospects allowed us to employ 11 new technical staff in our operational departments.

Turnover by regions	**in %**
Germany, Central Europe	0.1
Central, East & Southeast Asia	5.2
Sub-Saharan Africa	73.2
South & Eastern Europe	11.1
Maghreb & Middle East	10.4
Turnover by sectors	**in %**
Water	31
Environment	23
Agriculture	26
Governance	14
Waste	6



In May, 2016, AHT with its consortium partner RESING, completed the diagnostic phase in the development of a convention for IWRM in the Haouz-Mejjate basin in Morocco, within the GIZ AGIRE programme.

As part of this diagnostic, a 120 page atlas has been developed, vividly illustrating themes relevant to water resources management, to support discussions and decision making among key stakeholders in the sector.

Atlas page showing the water balance of the Haouz-Mejjate basin (in the background – cover page and the thematic page about sanitation)

New contracts recently acquired by AHT :

Indonesia: Forest Programme IV: Feasibility Study Reforestation and Watershed Management South/West Sulawesi (KfW) +++ **Mauretania:** PNBA and PND Avenant (KfW) +++ **Mali:** Extension of the Siengo Irrigation Scheme, Adenddum 4 (KfW) +++ **Madagascar:** Programme for inclusive municipal development and decentralization (PDCID) in Boeny and DIANA regions in Madagascar (KfW) +++ **Burkina Faso:** Programme for drinking water and sanitation in the regions of Boucle du Mouhoun, Hauts Bassins and Sud-Ouest (GIZ) +++ **Jordan:** Adaptation to Climate Change in the Jordan Valley: Khor al Kabed Irrigation System Components 1-3 (KfW) +++ **Ukraine:** Support of Nature Protected Areas (KfW) +++ **Tunisia:** Heightening of Bou Heurtma Dam (KfW) +++

Photos cover page : Flooded rice fields near Marovoay, Boeny region, Madagascar (top)
Micro-dam, Mali (left)
Dry river bed of Zayandeh Rud River, Iran (centre)
Harvesting of early-maturing sorghum Variety, Chad (right)

Climate Change Adaptation and Mitigation Strategies (contd.)

Dirk Rolker, Climate Change Expert

This issue of *All About* presents some of the main sectors in which effective climate change adaptation and mitigation take place. With more than 55 years of experience AHT has obtained the necessary expertise to support climate change adaptation and mitigation in the fields of water management, irrigation, agriculture, nature, forest and biodiversity protection, governance, and communal infrastructure. Considerations of climate change adaptation and mitigation permeate the planning and implementation of our management and engineering projects:

Water resources and their availability are dramatically affected by changes in the climate. Climate change intensifies the hydrological cycle, leading to a shift in rainfall patterns, and increasing the frequency and intensity of extreme weather events. This is already resulting in longer dry seasons in some regions, with shorter more intense rainy seasons, increasing flooding and soil erosion. Especially in dry subtropical regions, renewable surface and groundwater resources will be further reduced. Functional solutions to the adaptation challenge in the water sector are therefore urgently needed.

Integrated water resources management (IWRM), including improved water management infrastructure, an increased use of recycled water, and water policy reforms are just some of the best adaptation practices in the water sector. IWRM has an important role to play in ensuring that the users of shared water resources have the capacity to deal with current climate variability and long-term climate change. Climate-adapted water infrastructure e.g. for irrigation of crops, not only leads to a higher water use efficiency and associated economic benefits, it also safeguards water availability in the face of diminishing resources.

Flooding in West Bengal, India

Understanding climate change impacts and vulnerabilities is of paramount importance for planning infrastructure investments in general and water infrastructure in particular. Climate models coupled with other types of computer models, e.g. hydrological models, can provide orientation on how certain aspects, e.g. the frequency of floods, will develop under different climate change scenarios. This information can be used to ensure that future infrastructure will withstand the impacts of climate change.

Agricultural production and climate change are inextricably linked. On the one hand, existing agricultural production systems in many countries are under immense pressure due to climate change, whilst at the same time agricultural activities contribute around one quarter of global GHG emissions. Adaptation and mitigation in agriculture can provide opportunities for economic development and increase farmers' resilience. At farm level, individual farmers can adopt climate-smart agricultural techniques to be more resilient towards droughts, floods and variations in rainfall. At irrigation and drainage system level, improving irrigation efficiency is the best strategy to address water scarcity and to help secure food production while reducing GHG emissions.

Forests and other ecosystems suffer from climate change impacts. Deforestation and environmental degradation lead to increased GHG emissions. Maintaining healthy ecosystems is an important prerequisite for sustainable development. Afforestation, reforestation, integrated conservation projects, and community-based natural resource management are all strategies that help strengthening the role of natural ecosystems as a storage for GHGs and resource for socio-economic development.

Close to three quarters of all solid waste ends up in landfills contributing around a third of all methane emissions. Methane is a much more potent GHG than carbon dioxide. Preventing methane development in landfills is one of the most effective mitigation measures. In addition to reducing GHGs, improved Solid Waste Management (SWM) reduces other negatives effects on the environment and improves the living conditions of urban residents.

Plans and policies to deal with climate change are often developed by inter-governmental bodies or national governments. However, most investments aimed at adaptation and reducing GHG emissions take place at sub-national level. Most adaptation projects are implemented in close collaboration between public and private actors at the local level. Supporting good governance and capacity development of private and public actors is an important cornerstone of any successful adaptation and mitigation strategy.

On the following pages you will find a selection of AHT's implemented projects in the fields of climate change adaptation and mitigation. It highlights our strengths with respect to supporting adaptation and mitigation in IWRM planning, irrigation, modelling climate change impacts and vulnerability assessments, climate-smart agriculture, nature conservation, SWM, capacity building and awareness raising. Enjoy reading!

Fisher on Lake Maninjau, Sumatra, Indonesia

Jordan: Adaptation to Climate Change Projects in the Jordan Valley

Mixing Station for reclaimed and fresh water downstream of King Talal Dam, Jordan

The Jordan Valley Authority (JVA) contracted AHT in cooperation with Dorsch International Consultants (Germany) and Mostaqbal Engineering and Environmental Consultants (Jordan) to implement four projects to address impacts of climate change that have affected irrigated agriculture in the Jordan Valley (JV) for the past 25 years. Per capita water availability in the Jordan River basin has fallen as a result of less rainfall and population growth, challenging farmers to adapt crop production to the effects of climate change. The reuse of treated wastewater for irrigation is now promoted in the northern parts of the JV following positive experiences with technique in the southern parts of the valley over the last 30 years.

The four projects for implementation are: (i) the rehabilitation of the Ghor al Kabed irrigation system (KfW loan), (ii) an analysis of potential entities taking over O&M of the redesigned irrigation infrastructure (KfW-administrated grant from the German Government), (iii) Assisting the JVA to foster farmers' acceptance of reclaimed water use in northern JV (KfW-administrated grant from the German Government), and (iv) the design and construction of a conveyance pipeline for reclaimed water (a KfW-administrated grant from the European Union).

Charlotte Kahre, Governance Expert

Chad: Agricultural Adaptation to Climate Change in the Lake Chad Basin

Dr. Anja Stache, Team Leader/ Agricultural Expert

Since 2014, AHT has been supporting the Lake Chad Basin Commission (LCBC), within the context of its cooperation with GIZ, to identify, develop and test measures to facilitate agricultural adaptation to the impacts of climate change in the basin.

Strategies for agricultural adaptation to climate change (CC) can help to identify and implement measures to reduce the vulnerability of agricultural production systems in the face of CC impacts, for example reduced and increasingly irregular precipitation. Rainfed agriculture is the most vulnerable production system in the region, whilst recession agriculture is also affected due to its dependency on last rain fall of the rainy season for sowing.

The adaptation measures aim to strengthen the resilience of farmers. Sorghum is the most important crop for food security. Early-maturing varieties of this cereal with a 90 day vegetation cycle – compared to 130 days for traditional sorghum – have been successfully tested and yields are significantly higher than in preceding seasons. Additionally, cultivating water melons in recession agriculture with up to four harvests per season allows farmers to obtain an additional monetary income during dry season.

Experiences made in the transboundary pilot area of 35.000 km^2 will be described as "best practices". They will then be integrated into the "Regional CC adaptation strategy for agriculture including the development plan of Lake Chad" to enable regional scale dissemination.

Traditional crop fields during flood-recession, before harvesting

Tunisia: Integrated Water Resources Management of the Public Irrigation Schemes of Mornag

Tunisia is already part of the driest regions of our planet, with climate models predicting a decrease in precipitation, an increase in temperatures and rising sea levels. The area around the town of Mornag is characterized by the overexploitation of groundwater, mainly for irrigation, increasing seawater intrusion into groundwater, and the risk of salinization of soils and the destruction of productive cultivated areas (12,500 ha). The project objective is thus the introduction of integrated, ecological and sustainable water resources management and the sustainable use of agricultural soils in the project region through:

Medjerda-Cap Bon Channel, Tunisia

- Rehabilitating irrigation schemes and the system for recharging groundwater using surface water and treated waste water;
- Implementing IWRM and water reuse for agricultural irrigation;
- Introducing groundwater recharge with treated wastewater as a pilot measure on large areas.

The technical expertise required included input for expansion of the tertiary treatment step in the South Méliane wastewater treatment plant, the rehabilitation/expansion of existing wastewater pumping station and the extension of the transport pipeline to the infiltration areas.

Dr. Hubertus Schneider

Indonesia: Emission Reduction in Cities (ERiC) Programme – Solid Waste Management

Udo Lange, Backstopper / Training Expert

ERiC has been in implementation since 2015 within the framework of Indonesian-German Financial Cooperation (FC), and aims to contribute to the Indonesian Government's CO2 emission reduction and reform targets. The project supports the implementation of the Solid Waste Law UU18/2008 and of the National Climate Change Strategy in urban areas.
The programme aims to contribute to alleviating the negative effects of climate change on the environment and on urban living conditions. It supports local governments in sustainably reducing their GHG emissions from solid waste by 50 % throughout the city and supports the full operability and usage of new sorting and composting plants.
Activities include investing in climate friendly, environmentally sound disposal of household-like solid waste, the establishment of new sanitary landfill centres, sorting and composting plants and increased efficiency in waste collection and recycling.

Collection point for delivering neighbourhood waste by motor cart

The accompanying measures which AHT has been charged with include institutional, financial, organisational and technical strengthening of the municipal and regency departments dealing with SWM, and support the establishment of a Waste Monitoring and Planning System by preparing and updating GHG baselines for different cities and regencies.

Indonesia: Support to Indonesia's Climate Change Response

Daniel Waible, GIS Expert

In January 2016 GIZ International Services and AHT, funded by the EU, began providing technical assistance to the National Development Planning Agency (BAPPENAS) to support the achievement of targeted climate change response objectives in the LULUCF sector (Land-Use, Land-Use Change and Forestry). The project supports Aceh Province in contributing in an effective and coherent way to the national REDD+ strategy, by designing and streamlining provincial REDD+ strategies with existing development planning frameworks and by implementing and monitoring sustainable, participatory, transparent, low-carbon and economically sound land-use decisions. New investments and economic development initiatives, in particular in the forestry, mining and plantation sectors will be developed and made compatible with low-carbon, resource efficiency, biodiversity and livelihoods concerns, relevant provincial initiatives and with the national REDD+ strategy.

Wet rice and agroforestry land use system near Gunung Leuser National Park, Aceh

Pakistan: Climate Change Adaptation and Impact Assessment for Munda Dam

The Munda Dam Hydropower Project is proposed for the Swat River, 37 km north of Peshawar in the Khyber Pakhtunkhwa Province of Pakistan. The dam is designed as a Concrete Face Rockfill Dam (213 m high; 760 m crest length), with the 56 km long reservoir having a gross storage volume of 1.6 billion m^3 and a surface of 24 km^2.
The catchment area covers around 14,000 km^2 with a mean annual discharge of about 7 billion m^3. Runoff is composed of direct runoff, snowmelt and, to a small extent, glacier melt.
In addition to hydropower production, the dam project is expected to provide downstream flood protection, increase water availability for existing irrigation schemes, and enable the development of further irrigated areas.

Intake structure for new irrigation command area along the Swat River

The EU Delegation to Pakistan contracted AHT GROUP AG and NESPAK to undertake a study examining (i) how to improve the resilience of the Munda Dam Project in light of the predicted impacts of climate change and (ii) to assess the expected environmental, social and economic impact of the Munda Dam.
Within the first package of the study, the consultant team carried out a climate change assessment and forecast and analysed the potential impact of climate change on snowmelt and glacier melt, on discharge patterns, on extreme flood events, and on the Swat River Basin in terms of erosion potential, sedimentation, and land slide hazards.
Based on the analysis of monitoring data and forecasted results, the consortium drew up recommendations on environmental flow, design flood, measures for erosion control, watershed management and landslide prevention, existing landslides and on early flood warning systems.

Dr. Jürgen Rambow, IWRM Expert

Madagascar: Climate Smart Agriculture within the Project ”PLAE“

Michael Glückert, Chief Technical Advisor

Madagascar is particularly affected by the impacts of climate change. Cyclones, that regularly hit the country's coast, have become stronger and the dry season has become longer. Moreover, climate change exacerbates soil erosion and deforestation.

AHT has been working with the Malagasy Ministry of Agriculture since 1998 to prevent and control soil erosion through physical, e.g. fascines, and biological measures, e.g. deep-rooting grasses. Reforestation and the prevention of soil erosion from upslope land protects vulnerable agricultural land in lower lying areas and improves water availability.

The team of PLAE took part in the Madagascar National Policy Dialogue on Climate Smart Agriculture and Post-Harvest Management

Rice is the staple food of Madagascar. Although the focus of soil conservation measures is on protecting irrigated land in valley bottoms, rainfed farming on slopes is common, too. The project supports farmers in adopting climate-smart agriculture techniques in line with the principles of conservation agriculture. As part of this effort, the Participatory Erosion Control Project (PLAE) organizes farmer field schools and has set up local model farms to display new crop varieties with shorter vegetation periods and other traits necessary to withstand negative climate change impacts.

For further information see:
www.plae.mg

Ethiopia: Soil Conservation and Rehabilitation for Food Security

In 2015/16 Ethiopia experienced its worst drought in over 50 years. As of December 2015, more than 10 million people, mostly agro-pastoralists living in the country's low-lying drylands, were dependent on food aid. The drought has highlighted the urgent need to strengthen people's resilience and capacity towards climate variability and change.

Water harvesting structure in Afar region, Ethiopia

In the midst of the drought AHT, Vétérinaires Sans Frontières (VSF) from Kenya, and ICON carried out a baseline study for the GIZ project 'Soil Conservation and Rehabilitation for Food Security' in the Afar region. The project is part of the German Government's special initiative 'One World, No Hunger'.
As part of this effort AHT, VSF, and ICON deployed a team of international and national experts to carry out participatory research in eight districts of Afar. The team interviewed more than 700 households, some of these by applying the Computer-Assisted-Personal-Interviewing (CAPI) method. The study investigated the impacts of drought, climate and livelihood changes on water resources, crop and livestock production. The results of the baseline study will form the basis for planning, monitoring and evaluating climate-adapted soil conservation, crop and livestock production and water management approaches.

Dirk Rolker

News from the Russian Companies of the AHT Group

The Financial Year 2015
The accumulated turnover of MPS and its associated companies was, at RUB 338 Mio, slightly higher than in 2014, with pre-tax profit of RUB 85 Mio - substantially better then in 2013 (RUB 30 Mio). The share of MPS amounted to RUB 21 Mio.

Prospects for 2016
The accumulated turnover is expected to reach RUB 368 Mio with a total accumulated profit of RUB 82 Mio. The MPS share is expected to amount to RUB 26 Mio.

Orlovka – AIC
In January 2012, when AHT Group procured the majority shareholding in Orlovka – AIC, the cultivated area was only 950 ha. The turnover for the year 2011 was RUB 19.5 Mio.
In 2015 the company made its first operational profit with a turnover of RUB 94.4 Mio on 2950 ha.
By the end of 2016, the total area under cultivation will reach its maximum of 3650 ha.
During 2016 and 2017 the area with irrigated potatoes will increase by 50 % to 220 ha. With this, the main expansion and investment period will be almost completed.

In the next two years, turnover is expected to reach RUB 110 Mio in 2016 and RUB 135 Mio in 2017. The optimized production costs will increase to RUB 102 Mio and RUB 106 Mio respectively.
The long planned and finally realised expansion of seed potato production will form a solid base for the expected improvement in productivity over the coming years.

Based on the experience of the last four years, three rotation systems are being introduced, aiming to optimise the production cycle and reduce the risk of droughts by adapting the cultivation and the crops to the local microclimate and the properties of the individual fields:

Potato rotation
From 2017 220 ha per year will be reserved for the production of irrigated potatoes. A further 200 ha of irrigated fields are available for other crops. During the complete rotation cycle of 4 years, 1,080 ha will thus be irrigated. Following potato cultivation, the soil is intensively prepared and fertilised for corn, followed by soybean and durum, sown with mulch or no-till technologies.
Based on present prices there is a potential annual turnover of RUB 114 Mio or RUB 100,000 per ha, of which 82 % would come from irrigated fields.

Soybean rotation
1,410 ha of fields with deep black soils have been selected for this rotation, which consists of two consecutive years of soybean followed by one year of durum, all cultivated with no-till technology. In this rotation only potassium and phosphate will be applied to the soil, with no nitrate fertilizers. As the required nitrate is fixed in the soil by the soybean crop, the nitrate fixed over the two years will serve to fertilise the durum crop.
Potential yearly turnover based on present prices is estimated at RUB 39 Mio or RUB 28,000 for ha.

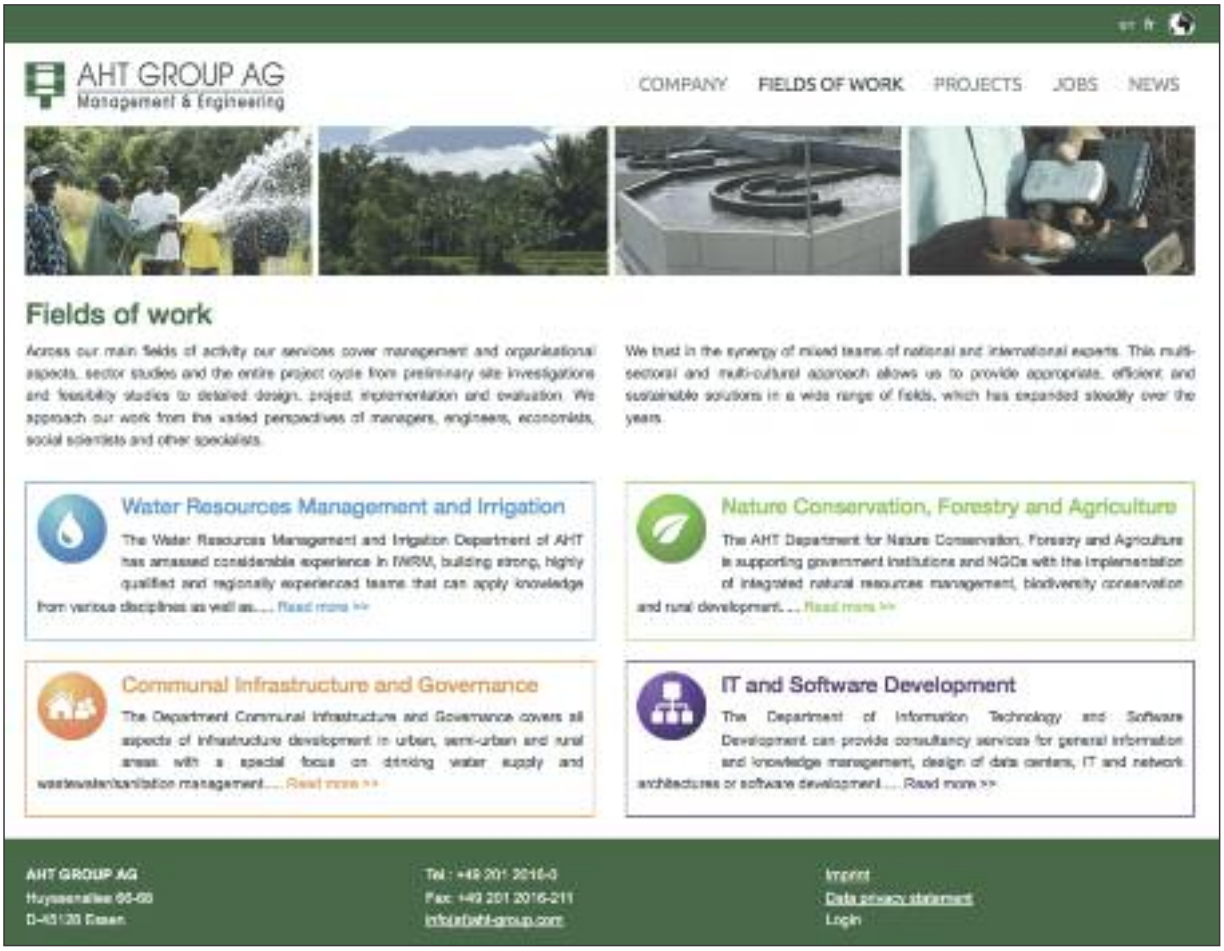
Sunflower rotation
The sunflower rotation consists out of 280 ha of sunflower which is then followed by durum wheat, Siberian oilseed (winter crop) and winter wheat. Poorer and drought prone soils are selected for the rotation. The 560 ha of winter crops spread the workload during seeding and harvesting over a longer period and ensure a cash income in early summer. The sunflower crop functions as a crop - insurance during dry years. During the winter months, the winter crops make better use of the accumulated soil moisture.
Potential yearly turnover based on present prices is estimated at RUB 22 Mio or RUB 19,000 per ha.

Climate Change Mitigation
The crop rotations introduced by Orlovka – AIC reflect the measures taken to mitigate the effects of climate change, and particularly of prolonged droughts:

- Crop production with resource saving technologies such as no-till;
- Growing of drought resistant crops such as sunflowers and to a certain extant soybeans;
- Growing of winter crops which make better use of the available soil moisture;
- Reduction of inputs such as herbicides and fertilisers through optimized crop rotations.

A powerful combination: the newly acquired 420 hp Kirovets tractor pulls the 12 m Kverneland no-till seeder with a 8,000 l seed and fertilizer bunker. Tractor and seed-combination are produced in Lipetsk, Russia

AHT launches new Homepage!



We are pleased to present our newly designed Homepage! All features are now also available in French! You also have the possibility to register for our new *Job Alert* e-mail service. Find out more under:

www.aht-group.com

IMPRESSUM

AHT GROUP AG
Management & Engineering
Huyssenallee 66-68
45128 Essen
Germany
Phone: +49 201 2016-0
Fax: +49 201 2016-211
E-Mail: info@aht-group.com
Internet: www.aht-group.com

Edited by:
Catherine Güttner
guettner@aht-group.com

Managing Director:
Dr. Hubertus Schneider

Supervisory Board:
Gerardus van Wissen (Chairman)

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