GUNNISON COUNTY ADMINISTRATION
Phone: (970) 641-0248, Fax: (970) 641-3061
Website: www.GunnisonCounty.org

March 20, 2014

Crystal Edmunds
ce301005@ohio.edu

Dear Crystal Edmunds,

We want to thank you for your interest in serving on the Weed Commission. The Board of County Commissioners will be holding interviews on **4/1/2014** in the Planning Commission Boardroom, located in the Blackstock Government building at 221 N. Wisconsin, Gunnison, CO. We have scheduled a 15 minute interview for you at **8:45:00 AM.** The boardroom is located upstairs in the Blackstock Government building, 221 N. Wisconsin Street, Gunnison, CO.

Because of the limited time, interviews cannot be rescheduled. If you are unable to attend this interview, please let us know as soon as possible so that we can arrange participation by telephone. **Please let me know a.s.a.p. if you need to perform your interview via telephone.**

If there is any additional information you would like to provide for review by the Board in advance of the meeting, please email it to: blucero@gunnisoncounty.org by **Friday, March 28th by 12 pm,** so that it may be included in their packets. Your letter of interest and information you already submitted will be placed in the Commissioner's packets. You do not have to re-submit what you have already provided.

If you have any questions regarding your interview, please feel free to contact me via telephone: (970) 641-7600 or email: blucero@gunnisoncounty.org. We look forward to seeing you **on 4/1/2014 at 8:45:00 AM**.

Sincerely,

Bobbie Lucero
Administrative Assistant III

Bobbie Lucero

From: Edmunds, Crystal <ce301005@ohio.edu> on behalf of crystal@coalcreek.org
Sent: Wednesday, March 19, 2014 3:38 PM
To: Bobbie Lucero
Subject: Watershed weed commission
Attachments: Circle of Blue Edmunds Application.pdf; Crystal Edmunds BROCHURE.pdf; Crystal Edmunds MAP.pdf; Snowshoe NEW! .jpg

Follow Up Flag: Follow up
Flag Status: Flagged

Hello! Please find my resume and work samples attached. Please disregard the cover letter: I am babysitting this afternoon and this is the only copy I could find.

Thank you!

Crystal Edmunds
OSM/VISTA Watershed Coordinator, Coal Creek Watershed Coalition Western Hardrock Watershed Team
419.779.3566

February 2014

Dear Circle of Blue and Members of the Selection Committee,

Please place me in consideration for an internship position. My deepest goals are to engage and educate-- and my deepest passions are to investigate and understand. I am currently completing my master's degree at the University of Denver's (DU) Josef Korbel School of International Studies in global finance, trade and economic integration, with a focus in environmental security and certificates in geographic information systems and humanitarian assistance and working for the Coal Creek Watershed Coalition (CCWC)/Western Hardrock Watershed Team (WHWT) as a watershed coordinator in Crested Butte, CO. The breadth of wisdom in this Valley is remarkable; I could not have foreseen how much knowledge I would absorb in my current position. Among other partners, I have had the opportunity to work with staff from the Colorado Division of Reclamation Mining and Safety, Forest Service, Bureau of Land Management, Crested Butte Land Trust, Rocky Mountain Biological Laboratory, professors from Western State Colorado University, and KBUT Community Radio. Building partnerships among these entities and their supporters has proved to be the foundation of my work. Perhaps some of the greatest leaders I've encountered in the "water world" are those young people from the WHWT, which consists of AmeriCorps volunteers in upwards of 30 watershed coalitions along the Colorado River. I am inspired by the dedication of community members to the health of our ecosystems-- as well as the challenges we face as a global community-- and I am committed to extending my service beyond Crested Butte to the world!

My academic, professional, and personal history provide me with the knowledge, skills and passion to fulfill the responsibilities of this position. My bachelor's of science in journalism from Ohio University's E.W. Scripps School of Journalism and two years of graduate school provide me with the skills necessary to be a holistic researcher and reporter. The world opened to me when I traveled to India the summer of my junior year of college; I was deeply challenged by the poverty I witnessed and could not understand particularly the proliferation of farmer suicides. Moved and inspired by what I learned abroad, much of my graduate work focused on resource economics and environmental history. A GIS certificate taught me how to, in the vision of Edward Tufte, visually display quantitative information-- a method vital in this information age. At DU, I was the communications coordinator for the Center on Rights Development, planning media relations, social media strategies, and relevant promotional literature. Further, while interning for Water for People, I wrote nearly 50 due diligence reports and found the experience to be rewarding in synthesizing important information and understanding global water challenges.

Before accepting my current position, I volunteered on seven farms in CO, NM, AZ, and CA through Willing Workers on Organic Farms for nearly seven months. While I researched environmental issues in school, I desired hands-on experience. It has proven to be one of the most rewarding educational experiences of my lifetime. I delved into agroforestry, care of livestock, soil science, hydropolitics and beyond-- and I concluded my time WWOOFing with a permaculture design certificate class at the Sonoran Permaculture Institute and seed school at Native Seeds/SEARCH. The systems thinking these experiences have instilled in me provide a unique lens in which to perceive environmental health and analyze and report environmental news.

These experiences have fortified the strength of my environmental understanding and passion; I am interested in working with Circle of Blue for generating "the fresh, objective reportage necessary for reasoned decision-making in the 21st century," strong scientific background, and affiliation with the Pacific Institute.

Warmly, Crystal Edmunds

CRYSTAL EDMUNDS

| PO Box 4224 | Crested Butte, Colorado 81224 | 419.779.3566 | crystal@coalcreek.org | TW: CCWC42 | Pintrest: CCWC | Linked In Profile

QUALIFICATIONS

-Journalism and Research Expertise
-Online media production and graphic design
-Knowledge of GIS and cartography
-Literacy in Environmental Policy & Education
-Intermediation Spanish, Beginner Persian
-Oral and Interpersonal Communication Skills

EDUCATION

University of Denver, Josef Korbel School of International Studies — **Expected Graduation Aug. 2016**
Peace Corps Masters International — *Denver, CO*
M.I. Candidate in Global Finance, Trade & Economic Integration with a focus in Environmental Security
Certificates: Humanitarian Assistance & Geographic Information Systems
2010-2011 Destiny Capital Mentors Program, Mentee
Peace Corps Award: $18,000 in educational awards for Peace Corps Service
AmeriCorps Award: $6,500 in educational awards for AmeriCorps Service

Native Seeds/ Southwestern Endangered Aridland Resources Clearing House — **March 2012**
Seed School Certificate — *Tucson, AZ*

Sonoran Permaculture Guild — **February 2012-March 2012**
Permaculture Design Certificate — *Tucson, AZ*

University of Wisconsin- Madison — **June- August 2010**
Arabic, Persian and Turkish Immersion Program, Intensive Persian — *Madison, WI*
Foreign Language and Area Studies Fellowship: $6,500 in educational awards

Ohio University, E.W. Scripps School of Journalism — **June 2009**
Bachelors of Science in Journalism — *Athens, OH*
Certificate: Global Leadership Center & Concentration: International Studies

Bangkok University — **Dec. 2007**
International Collaborative Consulting Project — *Bangkok, Thailand*

RESEARCH PAPERS

"Cartographic Analysis of Agricultural Investment and Land Acquisition in Africa": *Cartographic Design (Spring '11)*
"The Economics of Community-Based Natural Resource Management": *Econometrics (Spring '11)*
"Mapping Food Insecurity in West Africa": *GIS & Natural Hazards (Spring '11)*
"Environmental Degradation & Mining: Mapping Remediation in Crested Butte." *GIS Project Design (Spring '11)*
"Community-Based Forestry Management: Combating Desertification & Deforestation": *Environmental Economics (Winter '11)*
"The Public Distribution System in India: International Trade versus Buffer Stocks": *International Trade (Spring '10)*
"EIA: Agricultural Investment and Land Acquisition in Sudan": *Environmental Impact Assessment (Spring '10)*
"PRTs in Iraq and Afghanistan: Paradigms for Development": *International Economics Practicum (Spring '10)*
"Livelihoods and Market Analysis of Niger": *Applied Field Methods (Fall '10)*
"The Financial Crisis Analyzed Through the Financialization of Commodities": *International Monetary Relations (Fall '10)*
"Operational Proposal Regarding the 2010 Niger Food Crisis": *Health and Humanitarian Aid (Fall '10)*
"The Nile Basin Initiative & Ethiopian Water Security": *Humanitarian Aid in Complex Emergencies (Winter '10)*
"Resource Exploitation in the DRC": *Humanitarian Aid in Complex Emergencies (Winter '10)*
"Agrarian Change in India: Structural Adjustment & Indian Farmer Suicides": *Economic Development (Winter '10)*

PROFESSIONAL & VOLUNTARY EXPERIENCE

Western Hardrock Watershed Team — **March 2012-April 2014**
AmeriCorps VISTA/OSM Volunteer — *Crested Butte, CO*

-Responsible for building organizational capacity, conducting water quality and AMD monitoring, increasing community awareness through education and outreach, engaging in economic revitalization efforts, and securing future funding

-Managing social media networks of Facebook, Twitter, Pintrest, and Youtube as well as print media-- newsletters and flyers

-Assisting the Colorado Water Quality Monitoring Council with research, developing a monitoring plan and public education regarding Regulation 85, drafting text for the Web site, and troubleshooting GIS maps and data management methods

-Working with Mountain Roots to implement a community food assessment explore the feasibility of expanding local agriculture and local markets to address food insecurity, public health issues, water scarcity, unemployment and the environmental, social and political impacts of fossil fuel consumption. The assessment is guided by the vision of permaculture.

-Writing due diligence reports on Colorado Department of Public Health and Environment standards for heavy metals and chemicals, herbicides/ fertilizers/ pesticides mining companies, commodity trading companies, and market histories of metals

-Assisted organizational infrastructure and development with a communications plan, fundraising plan, and volunteer plan

-Utilizing TeachUNICEF, Tracking School and Project WET curricula for science programming at the local libraries

The Educate Foundation/Empower Campaign **June 2007-Current**
Board Member *Athens, OH*

-Promoted over three years from public relations intern and program coordinator, to communications coordinator and vice president, to board member

-Coordinated over 100 fairly-traded jewelry, basket, and clothing sales on campus and regionally at festivals and street fairs

-Developed student organization of over 100 volunteers and expanded chapter to four universities in Ohio

-Organized a 5K race of over 400 participants, raising $16,000, a human rights week, movie festivals, beer and wine tastings, benefit concerts, Mr. Empower Campaign competition, and "Pennies to Empower" fundraisers at \ elementary and high schools

-Raised over $30,000 in the 2007-2008 school year, and over $80,000 during the 2008-2009 school year

Willing Workers on Organic Farms **September 2011-March 2012**
Intern *AZ, CA, NM, CO*

-Volunteered on seven farms (Bean Tree Farm in AZ , Sleeping Frog Farm in AZ, Marana Heritage Food Bank Farm in AZ, Morning Star Ranch in CA, Heartland Mesa Ranch in NM, Infinity Farm in NM, Harvest Mountain in CO)

-Assisting in the harvesting of fruit trees and vegetables, preparing beds, creating compost, laying irrigation, creating berms and swales for rainwater harvesting, milking goats and preparing harvest for schools and markets

-Volunteering with the Pima County Food Systems Alliance to research local, regional and national policy champions/ legislation regarding small-scale agriculture and localized economies

Carskadon & Associates **June 2011- September 2011**
Executive Assistant *Denver, CO*

-Assistant to consultant in international natural and organic marketing sector, created international sales, brand identity, and marketing proposals and campaigns, responded to customer emails, processed requests, handled international relationships and inquiries, compiled press releases, website maintenance, and more.

Water for People **August 2010-July 2011**
Database and Resource Development Intern *Denver, CO*

-Uploaded information into The Raiser's Edge database: donor profiles, donations, due diligence reports

-Wrote due diligence reports on current and potential partners & reports for grant funders on project progress

-Assisted in the planning of The Sanctuary Golf Event and "100 Ways to Give" social media campaign

Center on Rights Development **Sept. 2010-June 2011**
Communications & 5K Coordinator *Denver, CO*

-Assisted with the coordination of special events, lectures and an annual symposium with over 300 attendees

-Planned the first "Run for Rights" 5K, as well as media and public relations, social media strategies, and wrote relevant promotional literature-- including a brochure and a monthly newsletter for the DU community

Community Food Initiatives **June- August 2009**
AmeriCorps VISTA Volunteer *Athens, OH*

-Coordinated the development of community gardens and public workshops in nine Appalachian counties

-Researched and taught production gardening, entrepreneurship, and cooking in a children's summer camp

-Planned media relations and social media strategies and developed a grant-writing book

The Institute for the African Child` **May 2009**
Conference Coordinator *Athens, OH*

-Coordinated PR for the conference "Including Children" with over 30 presenters and 500 participants

Kids Unlimited & Toledo Public Schools: **December 2008**
Intern and Volunteer Teaching Aide *Toledo, OH*

-Developed programming and coordination of after-school character development and academic activities

Antanaranga Society for Social and Economic Development, Stars Welfare Society, Mother Theresa's Motherhouse: Shishu Bhavan & Prem Dan **June- August 2008**
Community Development Volunteer *Kolkata, India*

-TEFL certified English teacher in three village schools with children ages two-16: a nursery school, a vocational school, and a night school

-Collaborated with teacher in lesson plan, cultural activity and test development

-Collaborated with administrators in a half-way home and vocational center with programming and caretaking of 20 mentally unstable women; assisted with caretaking of orphans, destitute men and women

The Global Leadership Center **Sept. 2007-June 2009**
Student Consultant *Athens, OH*

-**International Collaborative Consulting Project**: With Bangkok University students, created a marketing plan for Thai organic healthcare company Twin Lotus, Ltd. to enter the American market

-**Microfinance in Africa & The United Nations Development Program**, **Liberia**: Advised the UNDP in Liberia and the University of Liberia's Microfinance Training Program on how microfinance could be used for poverty reduction; research microfinance initiatives in Tanzania, Botswana, DRC, and other African countries to develop recommendations; organized fundraisers for the ICRC in Liberia; created a grant writing binder with myriad funders, information on the structure of a grant, writing tips, interviews from grant writers; The GLC won the Andrew Heiskell Award for Innovation in International Education, given by The Institute for International Education at the United Nations

-Japanese Culture Extension & Chubu University, Japan: With visiting Chubu University students, introduced select groups in Ohio (regional elementary schools, high schools, Rotary Clubs, retirement homes, youth camps) to Japanese aesthetics

-Technology Transfer & The Embassy of Poland: Assisted the Embassy of Poland enhance diplomatic work in Ohio in its programmatic areas of agricultural technology transfer, sustainable rural development, and non-profit organizational structure

-Corporate Social Responsibility & Marriott International, France: Investigated the current state of Marriott's corporate social responsibility and corporate PR internationally and in France; developed plan to expand awareness of CSR and Marriott's involvement in literacy campaigns; visited and spoke with executives in PR firms, conducted focus group sessions, presented to the World Headquarters

-Community Development & The Harvard University Pluralism Project: Documented a devotee's progressive vision for the future of a Hare Krishna community in WV; spent a weekend in the community articipating and observing religious rituals

The InterActivist Magazine **Dec. 2007- June 2009**
Reporter *Athens, OH*

-Wrote seven spotlights and two features in a 40-page monthly magazine providing alternative & grassroots news coverage

COMMUNITY INVOLVEMENT

Pima County Food Systems Alliance, Volunteer Researcher **Sept. 2011-March 2012**
Fighting World Hunger, Founding Member & Event Coordinator **Dec. 2010-September 2011**
Alpha Phi Omega Community Service Fraternity, Youth Service Committee **Sept. 2007-June 2009**
Amnesty International (Ohio University Chapter), Vice President **Sept. 2006-June 2007**

REFERENCES

-Jennifer Bock, Water Director at the High Country Citizens' Alliance: jen@hccaonline.org
-Jessica Barry, Team Director at Western Hardrock Watershed Team: teamdirector@hardrockteam.org
-Emma Pfister: Strategic Resource Development Coordinator at Water for People: epfister@waterforpeople.org

INTERNATIONAL CASE STUDIES IN COMMUNITY-BASED FOREST MANAGEMENT

LESSONS FROM MALI

- The community-as-sedentary-village approach fits poorly with the ecological and social realities of the Sahel. The spatial extent of "resource portfolios" for rural inhabitants varies from a distance of a few miles from some sedentary villagers to thousands of miles for some livestock herders. Mali has introduced ways to bring migrant forest users into community-based management systems, including:
  - Intensive applied participatory research programs that are directly incorporated into ongoing management and implementation efforts have been developed and refined.
  - Herder representation within decision-making entities has been encouraged.
  - To increase opportunities for migrant forest users to participate in critical discussions, key meetings in different locations to ensure nonresident users have a voice in such decisions are held.
  - Information available in appropriate formats and languages have been made available.
  - Key players (such as village leaders) who understand and respect migrant users are integral to development.

LESSONS FROM GUATEMALA

- Uncontrolled immigration, poor organization and governance, corruption and agricultural encroachment threaten the future stability of community forest enterprises
  - The borders of some concessions were drawn without close attention to the makeup of the forests and without input from forestry professionals. Several have since proved too small and devoid of high-value timber species that could provide a viable income from sustainable timber operations, and they have struggled to make a profit.
  - Communities need skills to manage the business side of the concession: sales, marketing, and certification. The National Forest Institute is helping refine villagers' technical forestry skills.
  - Long-term planning has improved CFEs' business performance. Chemonics has developed enterprises to produce five-year plans, forecasting timber supply, improving sales forecasts, and guiding investment decisions.
  - CFEs must have at least one manager with forestry experience, and governing boards must retain one or two members for more than one term of office.
  - FORESCOM, the collective forestry services company, markets the combined harvests of the members to command better prices and encourages the production of additional products.
  - Delegating certain critical management decisions to FORESCOM is one key factor that has made eight of the concessions self-sufficient and profitable.

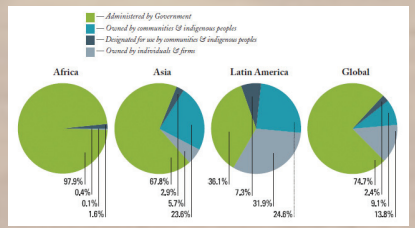
LESSONS FROM INDIA

- Community forest management has provided an alternative to traditional custodial policing systems, along with a fundamental shift from timber extraction to non-timber forest products.
- Thousands of forest protection committees have formed over the past decade, leading to the development of federations of forest protection committees throughout the subcontinent.

LESSONS FROM THE UNITED STATES

- Community-based efforts and collaborative efforts cannot be effective at changing global forces (liberalized economic policies, rapid demographic change, rapid movement of capital, escalating consumption rates)-- they must be strengthened through increased communication and sharing between communities and finding new political and economic mechanisms to influence global forces.
- The diversity that characterizes many communities is both a strength and a weakness for community-based ecosystem management. Brining traditionally marginalized groups into the partnerships still plagues community-based resource management around the world.
- In most cases, opportunities were missed to scale up local innovations and to modify the subsidies, tax frameworks, and forest management and market regulations that were crippling local enterprises.

FIGURE 1: FOREST TENURE BY REGION, 2010



Source: Rights and Resources Initiative. 2010. The End of the Hinterland: Forests, Conflict, and Climate Change. Washington, DC: Rights and Resources Initiative. p 6.

BIBLIOGRAPHY

African Development Bank Group. "Niger intensifies battle against desertification and drought." African Development Bank Group. Accessed Feb. 22, 2011. <http://www.afdb.org/en/news-events/article/niger-intensifies-battle-against-desertification-and-drought-7488/>.

Reij, Chris. et al. "Agroenvironmental transformation in the Sahel." IFPRI. November 2009. Accessed Feb. 22, 2011. <http://www.ifpri.org/publication/agroenvironmental-transformation-sahel>.

Reij, Chris. "Building on a current green revolution in the Sahel. Some lessons from farmer-managed re-greening in Niger." Amsterdam: Centre for International Cooperation, VU University Amsterdam. Accessed Feb. 22, 2011. <http://desertification.wordpress.com/2009/06/19/building-on-a-current-green-revolution-in-the-sahel-drynet-bothends/.>

Perry, Alex "Land of Hope." Dec. 12, 2010. Accessed Feb. 22, 2011. Time Magazine. <http://www.time.com/time/magazine/article/0,9171,2034377,00.html#ixzz1Bp8QaLmy>.

Rinaudo, Tony. The Permaculture Research Institute of Australia. "The Development of Farmer Managed Natural Regeneration." Sept. 24, 2008. Accessed Feb. 22, 2011. <http://permaculture.org.au/2008/09/24/the-development-of-farmer-managed-natural-regeneration/>.

World Resources Institute. "Routes to Resilience." World Resources Institute. 2008. Accessed March 2, 2011. <http://pdf.wri.org/world_resources_2008_roots_of_resilience_chapter3.pdf>.

COMMUNITY-BASED FOREST MANAGEMENT: COMBATING CLIMATE CHANGE, FOOD INSECURITY AND DESERTIFICATION IN NIGER

IN THIS BROCHURE:

PAGE ONE: Principles of Community-Based Forest Management & Economic Analysis of Community-Based Forest Management and UN-REDD & Key Achievements in Niger's Re-Greening Movement PAGE TWO: Key Dates in Niger's Greening & Farmer Managed Natural Regeneration PAGE THREE: International Case Studies in Community-Based Forest Management

Crystal Leigh Edmunds
Environmental Economics
Winter Quarter 2011

COMMUNITY-BASED FOREST MANAGEMENT

- The land is treated as part of the community.
- Land decisions are made through inclusive, open, and transparent community-based processes; when benefits flow from the land to the greater community, they flow through local communities.
- The community is acknowledged as part of the landscape. People and the communities in which they live are recognized as integral parts of forest ecosystems.
- New and various scales of analyses are used to understand ecosystem functions and the potential impact of human activities. These scales cover geographic, institutional, social and temporal parameters. One important scale is often referred to as "human" and seems to reflect a group's ability to think together on the same scale.
- Assessment and information-gathering efforts consciously include local knowledge as well as scientific expertise.
- An emphasis is placed on monitoring as a means of addressing accountability, building trust, and promoting learning, innovation and adaptive responses.

ECONOMIC ANALYSIS OF UN-REDD & COMMUNITY-BASED FOREST MANAGEMENT

- Ecosystems services from forests include fuelwood, non-timber forest products, timber, biodiversity, soil fertility, adaption to climactic shifts and erratic climate events, the protection of important water resources and downstream ecosystems, and the absorption of carbon.
- In many developing countries, smallholder and community-based forest enterprises have created stronger local economies and provided multiple benefits for livelihoods and cultural well-being.
  - In countries like Ghana, the Democratic Republic of the Congo, and Cameroon, the employment generated by CBFEs in the informal forest sector is 10 times that in the formal forest sector.
- The cost of securing tenure is well within reach. Based on data from Bolivia, Brazil, China, and Mozambique, the average cost associated with recognizing community tenure is estimated to be $1.35 per acre, with a range of $0.01–4.05 per acre. The average cost for the titling of household plots, based on data from Cambodia, Indonesia, Laos, and the Philippines, is $9.41 per acre, with a range of $3.84–14.95 per hectare.
  - In contrast, the total costs for UN-REDD are significantly higher, ranging from $162.60 per acre per year to $8,130 per acre per year, with implementation costs alone in the range of $1.63–74.80 per acre per year.
- Carbon markets could further complicate UN-REDD because of the additional funding such markets could unleash. It could lead to a kind of "resource curse," in which large inflows of funding could actually fuel corruption and bad governance.

KEY ACHIEVEMENTS OF NIGER'S RE-GREENING MOVEMENT

Building Environmental Capital

- An increase of 10- to 20-fold in tree and shrub cover on about 5 million ha of land, with approximately 200 million trees protected and managed (McGahuey and Winterbottom 2007:7; Tappan 2007; Reij 2008).
- At least 250,000 ha of degraded land reclaimed for crop production (McGahuey and Winterbottom 2007:7).
- Soil fertility improved as higher tree densities act as windbreaks to counter erosion, provide enriching mulch, and fix nitrogen in root systems (Reij 2006:iii).
- In some areas, the return of wild fauna, including hares, wild guinea fowls, squirrels, and jackals (Boubacar et al. 2005:16).
- Return of diverse local tree species that had all but disappeared from many areas and of beneficial insect and bird predators that reduce crop pests (Boubacar et al. 2005:13; Rinaudo 2005a:14).

Building Economic Capital

- Expanded cultivation of cereals and vegetables, with harvests doubling in some areas (Tougiani et al. 2008:16; Boubacar et al. 2005:25).
- Pods and leaves provide critical dry-season fodder supplies for livestock (Tougiani et al. 2008:16).
- New food export markets created, primarily to Nigeria (Reij 2006:ii).
- Rural incomes rose in three regions practicing farmer-managed natural regeneration (FMNR) (McGahuey and Winterbottom 2007:3).
- Creation of specialized local markets in buying, rehabilitating, and reselling degraded lands, with land values rising by 75–140 percent in some areas (Abdoulaye and Ibro 2006:44).
- Empowerment of hundreds of thousands of poor farmers, enabling them to pursue new enterprises and improve livelihoods (McGahuey 2008).

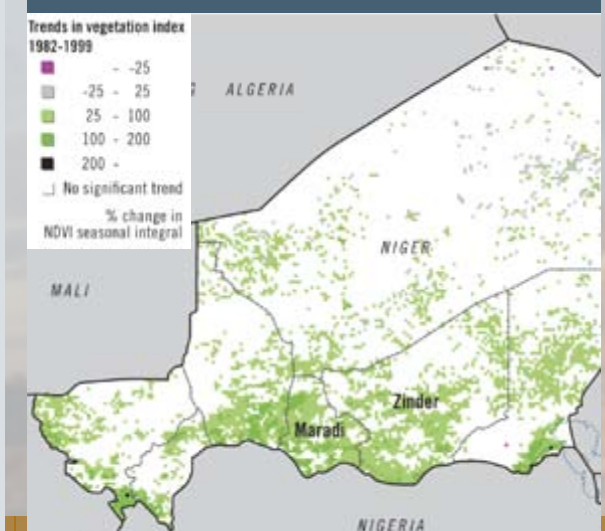
Building Social Capital

- Some 25–50 percent of all rural producers have adopted improved natural resource management techniques (estimate based on Tappan 2007).
- Food, fuelwood, and income provided by trees have increased food security (Reij 2006:iii).
- Nutrition and diets have improved through the availability of edible tree leaves and fruits as well as produce grown on rehabilitated plots (Larwanou et al. 2006:22).
- Improved access to land and income generation for women, widows, and the landless poor (McGahuey and Winterbottom 2007:13).
- Average time spent by women collecting firewood has fallen from 2.5 hours to half an hour (Reij 2006:iii).

FARMER-MANAGED NATURAL REGENERATION

- Niger's FMNR depends on the existence of living tree stumps in the fields to be re-vegetated. New stems which can be selected and pruned for improved growth sprout from these stumps. Standard practice has been for farmers to slash this valuable re-growth each year in preparation for planting crops.
- With a little attention, this growth can be turned into a valuable resource, enhancing crop yields. Here, all stalks except one have been cut from the stump. Side branches have been pruned half way up the stem. This single stem will be left to grow into a valuable pole. However, when the stem is harvested, the land will have no tree cover and there will be no wood to harvest for some time.
- More can be gained by selecting and pruning the best five or so stems and removing the remaining unwanted ones. In this way, when a farmer wants wood he/she can cut the stem(s) he/she wants and leave the rest to continue growing. These remaining stems will increase in size and value each year, and will continue to protect the environment and provide other useful materials and services such as fodder, humus, habitat for useful pest predators, and protection from the wind and shade. Each time one stem is harvested, a younger stem is selected to replace it.

TRENDS IN VEGETATION INDEX, 1982–1999



THE GREENING OF NIGER: KEY DATES

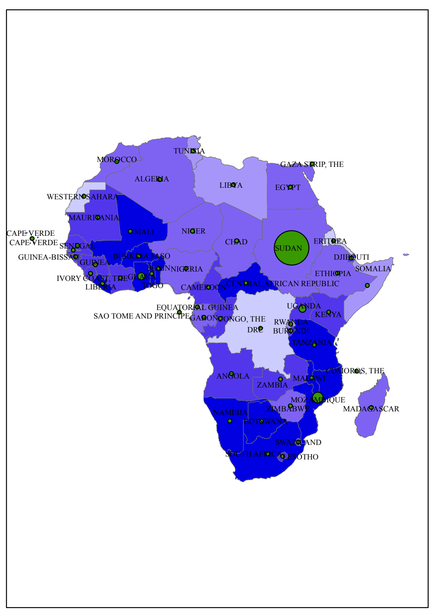
- **1935:** French law asserts that all natural resources in Niger, including trees, belong to the state
- **1960:** Independence from France; new government maintains natural resource rules and begins stricter enforcement with paramilitary Forest Service
- **1969 -1973:** 4-year drought cripples country
- **1975:** Multiple donors and NGOs enter Niger to improve food security and combat desertification, including CARE International's Majjia Valley Project
- **1983:** Serving in Mission (SIM) begins implementing Farmer-Managed Natural Regeneration (FMNR) as part of its Maradi Integrated Development Project (MIDP)
- **1984 -1985:** MIDP teams with World Food Program's Food for Work Program in 95 villages in Maradi in response to drought
- **1985:** Government creates Plan to Combat Desertification
- **1987:** Transitional government's Rural Code Secretariat coordinates with international aid groups to revise Rural Code and natural resource governance regulations
- **1993:** New Rural Code signed, transferring tree ownership to property owners
- **1996:** Coup d'état results in suspended donor assistance
- **1998:** Legislation to implement Rural Code at village level enacted
- **2004:** Rural Code enforcement begins at village level
- **2005:** Food shortages due to drought, locust infestation, and population pressures; farmers practicing FMNR and soil and water conservation techniques fare better than those that do not
- **2007:** Satellite images show that over 5 million ha of Niger has new vegetation thanks to regeneration efforts of previous twenty years

OPPOSITE PAGE: Key achievements in Niger's Greening ABOVE: The Greening of Niger, Key Dates. LEFT: Trends in Vegetation Index, 1982-1999. NEXT PAGE: Global Forest Tenure. All courtesy of WRI.

Cartographic Analysis of Land Acquisition in Africa

The third great wave of outsourcing-- the scramble for Africa's land-- grew out of the 2007-2008 food crisis. In 2008, World Bank President Zoellick warned that warned that 33 countries were at risk of social upheaval as a result of rising food costs. In 2008 food prices had risen by 75 percent since 2005, and world grain reserves were at their lowest-- 54 days-- in large part due the rise of investments in commodity indexes. IFPRI calculates that these deals are worth $20 billion- $30 billion-- at least ten times as much as an emergency package for agriculture announced by the World Bank in 2009. The World Bank estimates that 10 to 30 percent of available arable land could be up for grabs; about 95 percent of the cropland in Asia has been utilized, thus it is in Latin America and Africa where most of the demand for increased arable land is concentrated. According to FAO, only about 14 percent of the suited land in Africa is presently cultivated and between 2 and 10 percent of the land is held under formal land tenure.

Press Freedom Index-- 2009



Legend

Press Freedom

PFI_09

- 0.0
- 0.1 - 48.1
- 48.2 - 66.4
- 66.5 - 83.8
- 83.9 - 97.6

Land Deals

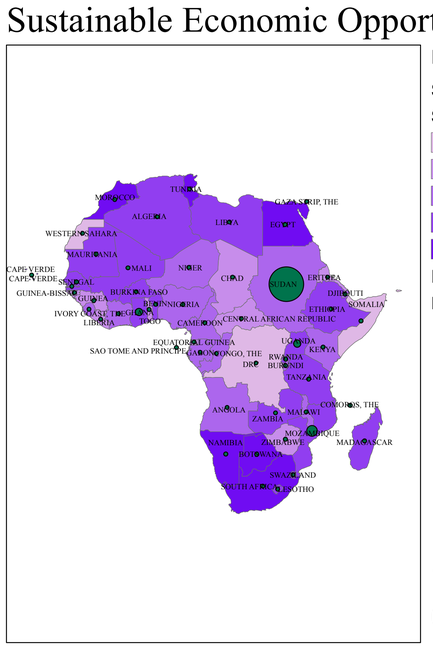
Land_HA

- 0 - 434069.7
- 434069.8 - 868139.4
- 868139.5 - 1302209.1
- 1302209.2 - 1736278.8
- 1736278.9 - 2170348.5
- 2170348.6 - 2604418.2
- 2604418.3 - 3038487.9
- 3038488 - 3472557.6
- 3472557.7 - 3906627.3
- 3906627.4 - 4340697

Source: Ibrahim Index

Assesses the state of press freedom in each country. It includes every kind of violation directly affecting journalists and news media, and it includes the degree of impunity enjoyed by those responsible for these press freedom violations. It also measures the level of self-censorship in each country and the ability of the media to investigate and criticise. Financial pressure is also assessed and incorporated into the final score. The raw data for this Indicator range from 1 to 6, with a low score being worst, and a high score being best. To produce the Ibrahim Index score the raw data were rescaled using the Min-Max method to transform them to a scale of 0 to 100, where 100 is always the best score possible.

Sustainable Economic Opportunity-- 2009



Legend

SustainableEcon

Sustain_Ec

- 0.0 - 3.8
- 3.9 - 34.9
- 35.0 - 45.9
- 46.0 - 54.7
- 54.8 - 69.8

Land Deals

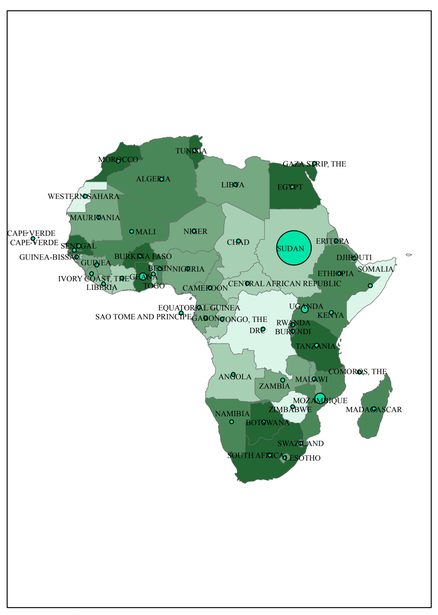
Land_HA

- 0.0 - 434069.7
- 434069.8 - 868139.4
- 868139.5 - 1302209.1
- 1302209.2 - 1736278.8
- 1736278.9 - 2170348.5
- 2170348.6 - 2604418.2
- 2604418.3 - 3038487.9
- 3038488.0 - 3472557.6
- 3472557.7 - 3906627.3
- 3906627.4 - 4340697.0

Source: Ibrahim Index

Average of public management, private sector, infrastructure, environment and the rural sector. The raw data for this Indicator range from 1 to 6, with a low score being worst, and a high score being best. To produce the Ibrahim Index score the raw data were rescaled using the Min-Max method to transform them to a scale of 0 to 100, where 100 is always the best score possible.

Environment and the Rural Sector-- 2009



Legend

Environ/Rural

Envi_Rural

- 0.0 - 16.2
- 16.3 - 41.8
- 41.9 - 55.2
- 55.3 - 63.4
- 63.5 - 87.7

Land Deals

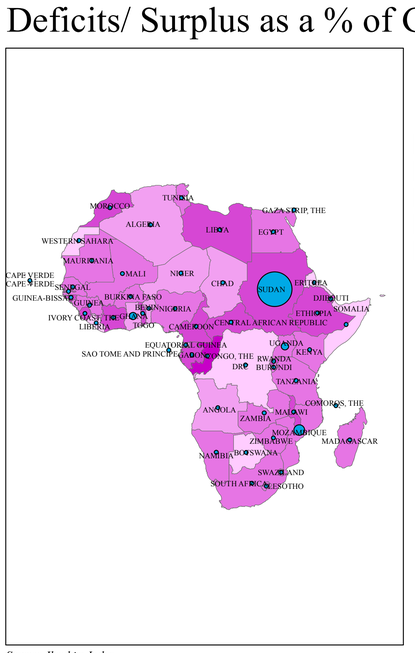
Land_HA

- 0.0 - 434069.7
- 434069.8 - 868139.4
- 868139.5 - 1302209.1
- 1302209.2 - 1736278.8
- 1736278.9 - 2170348.5
- 2170348.6 - 2604418.2
- 2604418.3 - 3038487.9
- 3038488.0 - 3472557.6
- 3472557.7 - 3906627.3
- 3906627.4 - 4340697.0

Source: Ibrahim Index

Average of the 8 indicator scores in this subcategory-- environmental sustainability, role of environment in policy formulation, land and water for agriculture, agriculture input and produce markets, rural financial services development, policy and legal framework for rural organizations, public resources for rural development, dialogue between government and rural organizations. The raw data for this Indicator range from 1 to 6, with a low score being worst, and a high score being best. To produce the Ibrahim Index score the raw data were rescaled using the Min-Max method to transform them to a scale of 0 to 100, where 100 is always the best score possible.

Deficits/ Surplus as a % of GDP-- 2009



Legend

Def/Surplus

Def_Surp_G

- 0.0
- 0.1 - 31.2
- 31.3 - 45.2
- 45.3 - 65.8
- 65.9 - 100.0

Land Deals

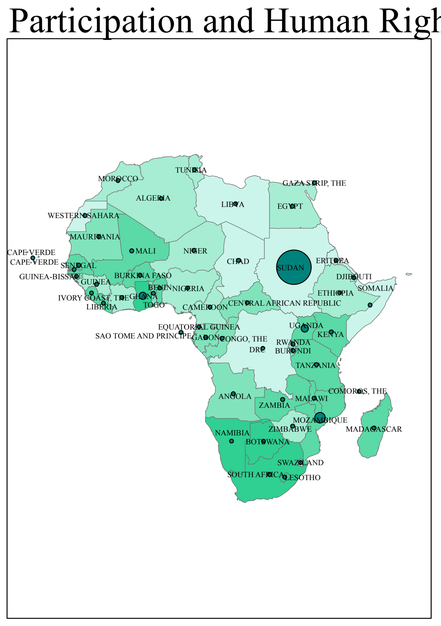
Land_HA

- 0.0 - 434069.7
- 434069.8 - 868139.4
- 868139.5 - 1302209.1
- 1302209.2 - 1736278.8
- 1736278.9 - 2170348.5
- 2170348.6 - 2604418.2
- 2604418.3 - 3038487.9
- 3038488.0 - 3472557.6
- 3472557.7 - 3906627.3
- 3906627.4 - 4340697.0

Source: Ibrahim Index

Central government receipts minus central government outlays, as a percentage of GDP. The raw data for this Indicator range from 1 to 6, with a low score being worst, and a high score being best. To produce the Ibrahim Index score the raw data were rescaled using the Min-Max method to transform them to a scale of 0 to 100, where 100 is always the best score possible.

Participation and Human Rights-- 2009



Legend

Participation/HR

Partic_HR_

- 0.0 - 23.1
- 23.2 - 38.0
- 38.1 - 48.9
- 49.0 - 62.0
- 62.1 - 79.7

Land Deals

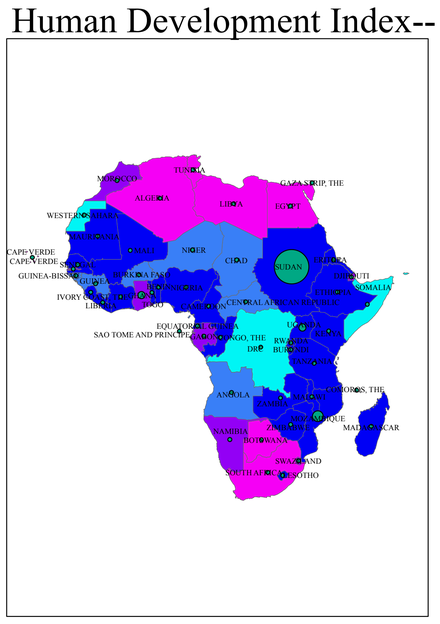
Land_HA

- 0.0 - 434069.7
- 434069.8 - 868139.4
- 868139.5 - 1302209.1
- 1302209.2 - 1736278.8
- 1736278.9 - 2170348.5
- 2170348.6 - 2604418.2
- 2604418.3 - 3038487.9
- 3038488.0 - 3472557.6
- 3472557.7 - 3906627.3
- 3906627.4 - 4340697.0

Source: Ibrahim Index

Average of three subcategories: particpation-- political participation, effective power to govern, free and fair elections, electoral self-determination, free and fair executive elections; right--human rights, political rights, worker's rights, freedom of expression, freedom of association and assembly, press freedom, civil liberties, ratification and initial reporting of core international human rights conventions; gender-- gender equity, primary school completion rate, ratio of girls to boys in primary and secondary school, women's participation in the labor force, women in parliament, women's rights, legislation on violence agaisnt women. The raw data for this Indicator range from 1 to 6, with a low score being worst, and a high score being best. To produce the Ibrahim Index score the raw data were rescaled using the Min-Max method to transform them to a scale of 0 to 100, where 100 is always the best score possible.

Human Development Index-- 2009



Legend

HDI

HDI_09

- 0.0 - 7.9
- 8.0 - 36.2
- 36.3 - 51.5
- 51.6 - 64.5
- 64.6 - 84.9

Land Deals

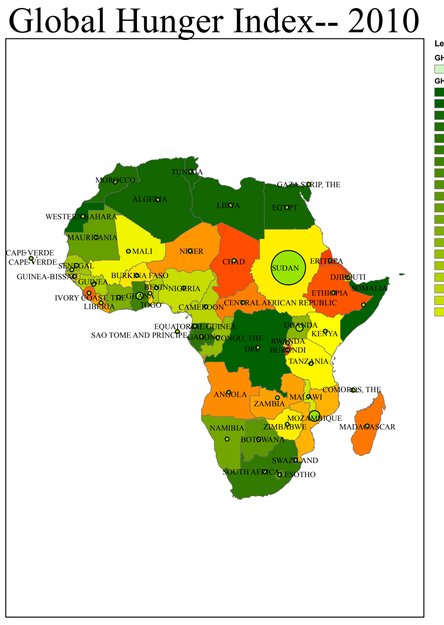
Land_HA

- 0.0 - 434069.7
- 434069.8 - 868139.4
- 868139.5 - 1302209.1
- 1302209.2 - 1736278.8
- 1736278.9 - 2170348.5
- 2170348.6 - 2604418.2
- 2604418.3 - 3038487.9
- 3038488.0 - 3472557.6
- 3472557.7 - 3906627.3
- 3906627.4 - 4340697.0

Source: Ibrahim Index

Average of Health and Welfare-- incidence of TB, child mortality,immunization against measles, welfare regime, social protection and labor, social exclusion, antiretroviral treatment provision, access to piped water, access to improved water, access to improved sanitation, open defecation sanitation & Education-- education provision and quality, ratio of pupils to teachers in primary school, primary school completion rate, progression to secondary school and tertiary enrollment rates. The raw data for this Indicator range from 1 to 6, with a low score being worst, and a high score being best. To produce the Ibrahim Index score the raw data were rescaled using the Min-Max method to transform them to a scale of 0 to 100, where 100 is always the best score possible.

Global Hunger Index-- 2010



Legend

GHI

- <all other values>

GHI_10

- n/a
- <5
- 5.8
- 6.4
- 7.3
- 10
- 10.8
- 12.2
- 12.5
- 13.1
- 13.6
- 14
- 15
- 15.2
- 16.8
- 17.1
- 17.6
- 17.8
- 18.2
- 18.5
- 19.1
- 19.8
- 20.7
- 20.9
- 21.1
- 22.4
- 22.6
- 23.1
- 23.5
- 23.7
- 24.3
- 24.9
- 25.9
- 27.2
- 27.4
- 27.5
- 27.9
- 28.9
- 29.8
- 30.9
- 35.7
- 38.3

Land Deals

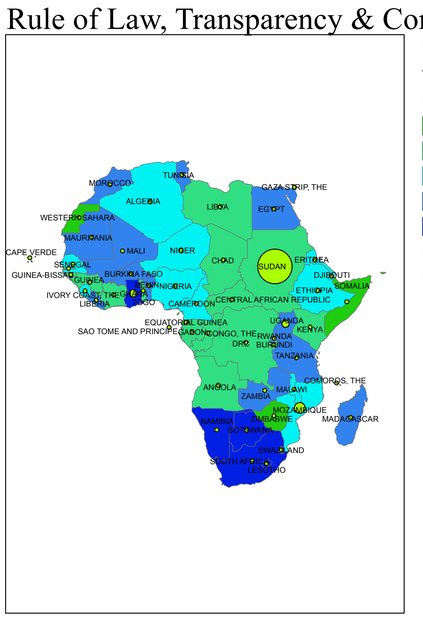
Land_HA

- 0.0 - 434069.7
- 434069.8 - 868139.4
- 868139.5 - 1302209.1
- 1302209.2 - 1736278.8
- 1736278.9 - 2170348.5
- 2170348.6 - 2604418.2
- 2604418.3 - 3038487.9
- 3038488.0 - 3472557.6
- 3472557.7 - 3906627.3
- 3906627.4 - 4340697.0

Source: FAO

The Global Hunger Index is a multidimensional statistical tool used to describe the state of countries' hunger situation.The GHI combines three equally weighted indicators: 1) the proportion of the undernourished as a percentage of the population; 2) the prevalence of underweight children under the age of five; and 3) the mortality rate of children under the age of five. The Index ranks countries on a 100 point scale, with 0 being the best score ("no hunger") and 100 being the worst, though neither of these extremes is achieved in practice. The higher the score, the worse the food situation of a country. Values less than 4.9 reflect "low hunger," values between 5 and 9.9 reflect "moderate hunger", values between 10 and 19.9 indicate a "serious," values between 20 and 29.9 are "alarming", and values exceeding 30 are "extremely alarming" hunger problem.

Rule of Law, Transparency & Corruption-- 2009



Legend

Trans/Corrupt

Law_Trans_

- 0.0 - 14.9
- 15.0 - 33.5
- 33.6 - 45.3
- 45.4 - 58.6
- 58.7 - 89.0

Land Deals

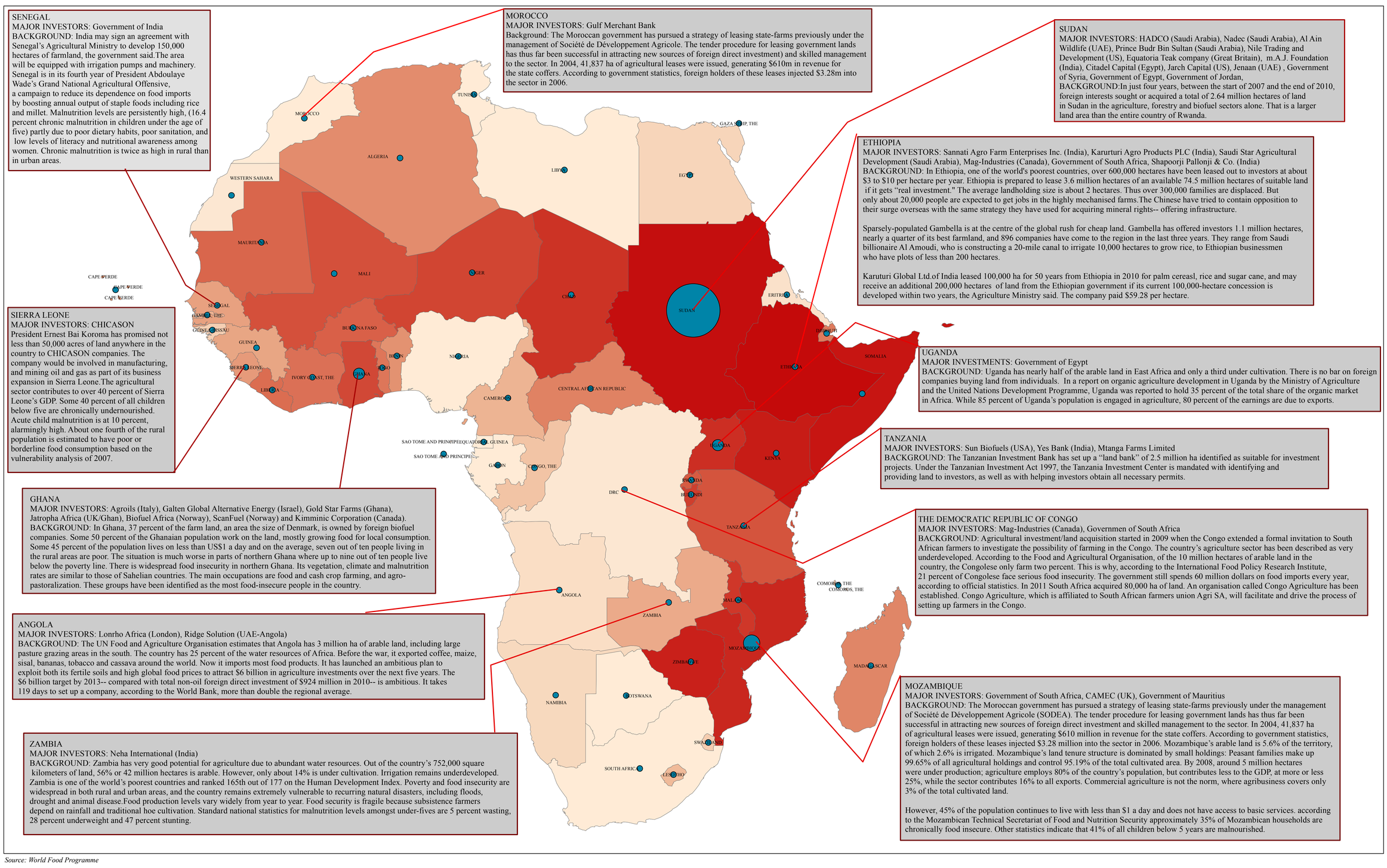
Land_HA

- 0.0 - 434069.7
- 434069.8 - 868139.4
- 868139.5 - 1302209.1
- 1302209.2 - 1736278.8
- 1736278.9 - 2170348.5
- 2170348.6 - 2604418.2
- 2604418.3 - 3038487.9
- 3038488.0 - 3472557.6
- 3472557.7 - 3906627.3
- 3906627.4 - 4340697.0

Source: Ibrahim Index

Average of: ratification of core international human rights conventions, presence of international sanctions, laws on contracts and property rights, judicial independence, efficiency of the courts, efficiency of national institutions regarding contract enforcement & public sector corruption. The raw data for this Indicator range from 1 to 6, with a low score being worst, and a high score being best. To produce the Ibrahim Index score the raw data were rescaled using the Min-Max method to transform them to a scale of 0 to 100, where 100 is always the best score possible.

World Food Programme Food Aid in Metric Tons-- 2010; Analyses of Land Deals & Development



SENEGAL
MAJOR INVESTORS: Government of India
BACKGROUND: India may sign an agreement with Senegal's Agricultural Ministry to develop 150,000 hectares of farmland, the government said.The area will be equipped with irrigation pumps and machinery. Senegal is in its fourth year of President Abdoulaye Wade's Grand National Agricultural Offensive, a campaign to reduce its dependence on food imports by boosting annual output of staple foods including rice and millet. Malnutrition levels are persistently high, (16.4 percent chronic malnutrition in children under the age of five) partly due to poor dietary habits, poor sanitation, and low levels of literacy and nutritional awareness among women. Chronic malnutrition is twice as high in rural than in urban areas.

MOROCCO
MAJOR INVESTORS: Gulf Merchant Bank
Background: The Moroccan government has pursued a strategy of leasing state-farms previously under the management of Société de Développement Agricole. The tender procedure for leasing government lands has thus far been successful in attracting new sources of foreign direct investment) and skilled management to the sector. In 2004, 41,837 ha of agricultural leases were issued, generating $610m in revenue for the state coffers. According to government statistics, foreign holders of these leases injected $3.28m into the sector in 2006.

SUDAN
MAJOR INVESTORS: HADCO (Saudi Arabia), Nadec (Saudi Arabia), Al Ain Wildlife (UAE), Prince Budr Bin Sultan (Saudi Arabia), Nile Trading and Development (US), Equatoria Teak company (Great Britain), m.A.J. Foundation (India), Citadel Capital (Egypt), Jarch Capital (US), Jenaan (UAE) , Government of Syria, Government of Egypt, Government of Jordan,
BACKGROUND:In just four years, between the start of 2007 and the end of 2010, foreign interests sought or acquired a total of 2.64 million hectares of land in Sudan in the agriculture, forestry and biofuel sectors alone. That is a larger land area than the entire country of Rwanda.

ETHIOPIA
MAJOR INVESTORS: Sannati Agro Farm Enterprises Inc. (India), Karurturi Agro Products PLC (India), Saudi Star Agricultural Development (Saudi Arabia), Mag-Industries (Canada), Government of South Africa, Shapoorji Pallonji & Co. (India)
BACKGROUND: In Ethiopia, one of the world's poorest countries, over 600,000 hectares have been leased out to investors at about $3 to $10 per hectare per year. Ethiopia is prepared to lease 3.6 million hectares of an available 74.5 million hectares of suitable land if it gets "real investment." The average landholding size is about 2 hectares. Thus over 300,000 families are displaced. But only about 20,000 people are expected to get jobs in the highly mechanised farms.The Chinese have tried to contain opposition to their surge overseas with the same strategy they have used for acquiring mineral rights-- offering infrastructure.

Sparsely-populated Gambella is at the centre of the global rush for cheap land. Gambella has offered investors 1.1 million hectares, nearly a quarter of its best farmland, and 896 companies have come to the region in the last three years. They range from Saudi billionaire Al Amoudi, who is constructing a 20-mile canal to irrigate 10,000 hectares to grow rice, to Ethiopian businessmen who have plots of less than 200 hectares.

Karuturi Global Ltd.of India leased 100,000 ha for 50 years from Ethiopia in 2010 for palm cereasl, rice and sugar cane, and may receive an additional 200,000 hectares of land from the Ethiopian government if its current 100,000-hectare concession is developed within two years, the Agriculture Ministry said. The company paid $59.28 per hectare.

SIERRA LEONE
MAJOR INVESTORS: CHICASON
President Ernest Bai Koroma has promised not less than 50,000 acres of land anywhere in the country to CHICASON companies. The company would be involved in manufacturing, and mining oil and gas as part of its business expansion in Sierra Leone.The agricultural sector contributes to over 40 percent of Sierra Leone's GDP. Some 40 percent of all children below five are chronically undernourished. Acute child malnutrition is at 10 percent, alarmingly high. About one fourth of the rural population is estimated to have poor or borderline food consumption based on the vulnerability analysis of 2007.

UGANDA
MAJOR INVESTMENTS: Government of Egypt
BACKGROUND: Uganda has nearly half of the arable land in East Africa and only a third under cultivation. There is no bar on foreign companies buying land from individuals. In a report on organic agriculture development in Uganda by the Ministry of Agriculture and the United Nations Development Programme, Uganda was reported to hold 35 percent of the total share of the organic market in Africa. While 85 percent of Uganda's population is engaged in agriculture, 80 percent of the earnings are due to exports.

TANZANIA
MAJOR INVESTORS: Sun Biofuels (USA), Yes Bank (India), Mtanga Farms Limited
BACKGROUND: The Tanzanian Investment Bank has set up a "land bank" of 2.5 million ha identified as suitable for investment projects. Under the Tanzanian Investment Act 1997, the Tanzania Investment Center is mandated with identifying and providing land to investors, as well as with helping investors obtain all necessary permits.

GHANA
MAJOR INVESTORS: Agroils (Italy), Galten Global Alternative Energy (Israel), Gold Star Farms (Ghana), Jatropha Africa (UK/Ghan), Biofuel Africa (Norway), ScanFuel (Norway) and Kimminic Corporation (Canada).
BACKGROUND: In Ghana, 37 percent of the farm land, an area the size of Denmark, is owned by foreign biofuel companies. Some 50 percent of the Ghanaian population work on the land, mostly growing food for local consumption. Some 45 percent of the population lives on less than US$1 a day and on the average, seven out of ten people living in the rural areas are poor. The situation is much worse in parts of northern Ghana where up to nine out of ten people live below the poverty line. There is widespread food insecurity in northern Ghana. Its vegetation, climate and malnutrition rates are similar to those of Sahelian countries. The main occupations are food and cash crop farming, and agro-pastoralization. These groups have been identified as the most food-insecure people in the country.

THE DEMOCRATIC REPUBLIC OF CONGO
MAJOR INVESTORS: Mag-Industries (Canada), Governmen of South Africa
BACKGROUND: Agricultural investment/land acquisition started in 2009 when the Congo extended a formal invitation to South African farmers to investigate the possibility of farming in the Congo. The country's agriculture sector has been described as very underdeveloped. According to the Food and Agricultural Organisation, of the 10 million hectares of arable land in the country, the Congolese only farm two percent. This is why, according to the International Food Policy Research Institute, 21 percent of Congolese face serious food insecurity. The government still spends 60 million dollars on food imports every year, according to official statistics. In 2011 South Africa acquired 80,000 ha of land. An organisation called Congo Agriculture has been established. Congo Agriculture, which is affiliated to South African farmers union Agri SA, will facilitate and drive the process of setting up farmers in the Congo.

ANGOLA
MAJOR INVESTORS: Lonrho Africa (London), Ridge Solution (UAE-Angola)
BACKGROUND: The UN Food and Agriculture Organisation estimates that Angola has 3 million ha of arable land, including large pasture grazing areas in the south. The country has 25 percent of the water resources of Africa. Before the war, it exported coffee, maize, sisal, bananas, tobacco and cassava around the world. Now it imports most food products. It has launched an ambitious plan to exploit both its fertile soils and high global food prices to attract $6 billion in agriculture investments over the next five years. The $6 billion target by 2013-- compared with total non-oil foreign direct investment of $924 million in 2010-- is ambitious. It takes 119 days to set up a company, according to the World Bank, more than double the regional average.

MOZAMBIQUE
MAJOR INVESTORS: Government of South Africa, CAMEC (UK), Government of Mauritius
BACKGROUND: The Moroccan government has pursued a strategy of leasing state-farms previously under the management of Société de Développement Agricole (SODEA). The tender procedure for leasing government lands has thus far been successful in attracting new sources of foreign direct investment and skilled management to the sector. In 2004, 41,837 ha of agricultural leases were issued, generating $610 million in revenue for the state coffers. According to government statistics, foreign holders of these leases injected $3.28 million into the sector in 2006. Mozambique's arable land is 5.6% of the territory, of which 2.6% is irrigated. Mozambique's land tenure structure is dominated by small holdings: Peasant families make up 99.65% of all agricultural holdings and control 95.19% of the total cultivated area. By 2008, around 5 million hectares were under production; agriculture employs 80% of the country's population, but contributes less to the GDP, at more or less 25%, while the sector contributes 16% to all exports. Commercial agriculture is not the norm, where agribusiness covers only 3% of the total cultivated land.

However, 45% of the population continues to live with less than $1 a day and does not have access to basic services. according to the Mozambican Technical Secretariat of Food and Nutrition Security approximately 35% of Mozambican households are chronically food insecure. Other statistics indicate that 41% of all children below 5 years are malnourished.

ZAMBIA
MAJOR INVESTORS: Neha International (India)
BACKGROUND: Zambia has very good potential for agriculture due to abundant water resources. Out of the country's 752,000 square kilometers of land, 56% or 42 million hectares is arable. However, only about 14% is under cultivation. Irrigation remains underdeveloped. Zambia is one of the world's poorest countries and ranked 165th out of 177 on the Human Development Index. Poverty and food insecurity are widespread in both rural and urban areas, and the country remains extremely vulnerable to recurring natural disasters, including floods, drought and animal disease.Food production levels vary widely from year to year. Food security is fragile because subsistence farmers depend on rainfall and traditional hoe cultivation. Standard national statistics for malnutrition levels amongst under-fives are 5 percent wasting, 28 percent underweight and 47 percent stunting.

Legend

WFP Food Aid

- <other values>

WFP_Aid_09

- n/a
- 6.7
- 25.3
- 361.1
- 1737
- 2402.3
- 2,530.60
- 6,098.20
- 6991.2
- 7500.0
- 7568.6
- 10023.6
- 12687.9
- 15,207.50
- 15542.7
- 15,686.30
- 17,059.5 320
- 18067.7
- 18439.8
- 20,142.50
- 22230.4
- 22787.0
- 23091.7
- 25,236.40
- 25587.6
- 26060.8
- 26,888.90
- 28239.5
- 28,977.70
- 29,305.90
- 30,169.70
- 30456.7
- 47,507.40
- 62053.6
- 96945.4
- 109839.4
- 111,673.20
- 160,377.50
- 220,447.20
- 269360.7
- 320,224.40
- 500,327.20
- 978544.3

Land Deals

Land_HA

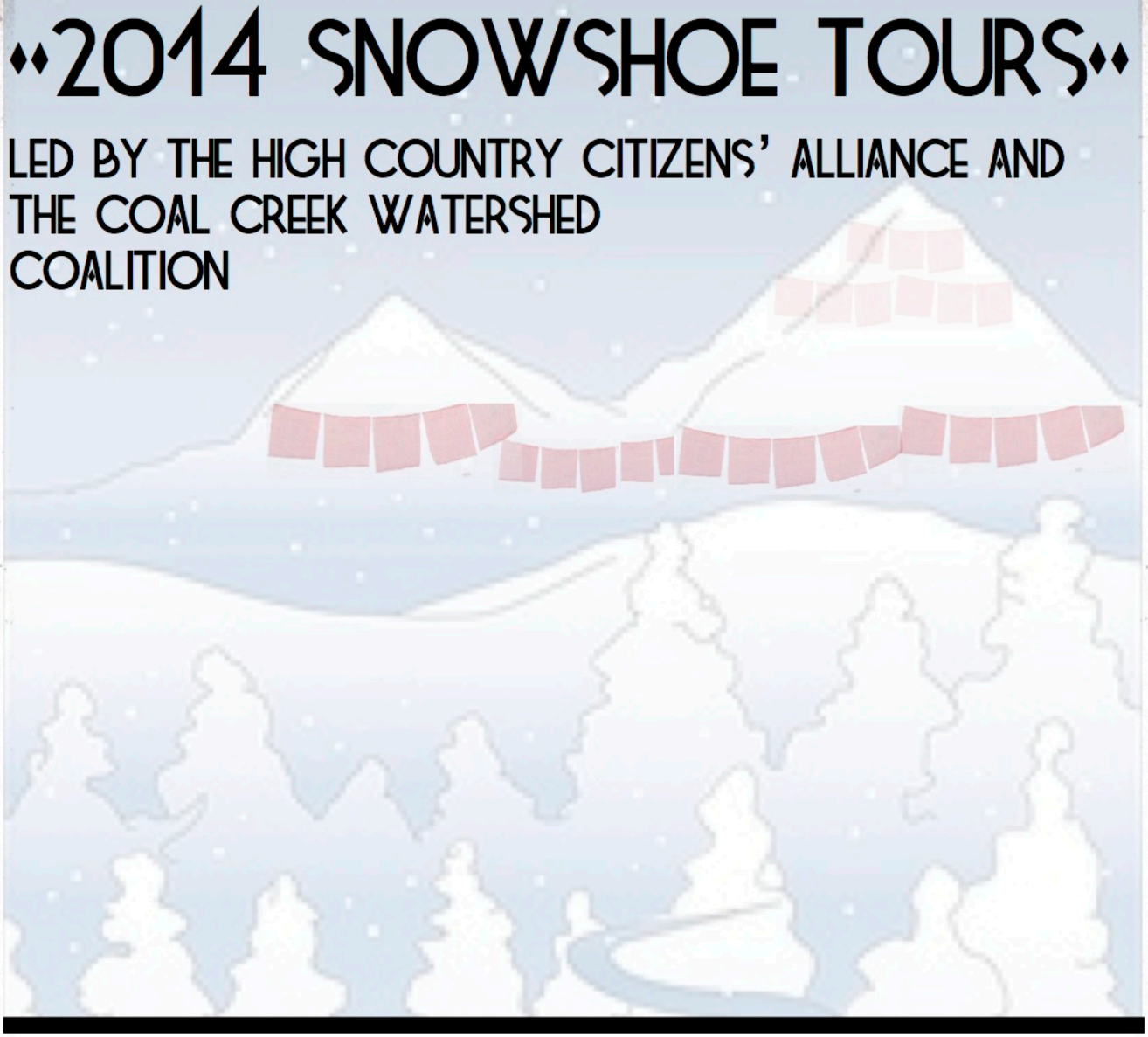
- 0.0 - 434069.7
- 434069.8 - 868139.4
- 868139.5 - 1302209.1
- 1302209.2 - 1736278.8
- 1736278.9 - 2170348.5
- 2170348.6 - 2604418.2
- 2604418.3 - 3038487.9
- 3038488.0 - 3472557.6
- 3472557.7 - 3906627.3
- 3906627.4 - 4340697.0

Crystal Leigh Edmunds
Spring Quarter 2011

Source: World Food Programme

••2014 SNOWSHOE TOURS••

LED BY THE HIGH COUNTRY CITIZENS' ALLIANCE AND THE COAL CREEK WATERSHED COALITION



JOIN THE HIGH COUNTRY CITIZENS' ALLIANCE AND OUR PARTNERS IN CONSERVATION FOR SNOWSHOE TOURS OF THE SLATE RIVER WATERSHED.

WHEN: TUESDAYS JANUARY 28, FEBRUARY 18, MARCH 18 10AM-1PM
MEET AT THE NORDIC CENTER- SECOND AND WHITEROCK
THE NORDIC CENTER IS OFFERING GEAR AT A DISCOUNT PRICE OF $15
BRING: WATER, WARM CLOTHING, SNACKS AND AN ADVENTUROUS SPIRIT!
THIS EVENT IS FREE-- DONATIONS TO HCCA AND CCWC WELCOME.
RSVP WITH 24 HOUR NOTICE TO HCCA OFFICE AT 349-7104 EXT 3. OR HCCAONLINE.ORG

High Country Citizens' Alliance

Coal Creek Watershed Coalition
Protect and Restore

Crested Butte Nordic

Bobbie Lucero

From: Edmunds, Crystal <ce301005@ohio.edu> on behalf of crystal@coalcreek.org
Sent: Friday, March 28, 2014 2:27 PM
To: Bobbie Lucero
Subject: Noxious Weeds Research!

Follow Up Flag: Follow up
Flag Status: Flagged

Hello!

This is Crystal Edmunds from the Coal Creek Watershed Coalition in Crested Butte. I've been working on outreach regarding weeds: here is the pinboard that I am working on and a Facebook album of noxious weeds in the watershed. I know they are small things, but I wanted to share anyways!

Thank you!
Crystal Edmunds
OSM/VISTA Watershed Coordinator, Coal Creek Watershed Coalition
Western Hardrock Watershed Team
419.779.3566
Please visit us on Facebook, Twitter and YouTube!

Sign Up

Email or Phone
Password
Log In
Keep me logged in
Forgot your password?

Noxious Weeds of the Watershed

By Coal Creek Watershed Coalition · Updated about 8 months ago

Noxious weeds are non-native plant species that have been introduced into an environment with few, if any, natural biological controls, thus giving them a distinct competitive advantage in dominating and crowding out native plant species. They have the ability to dominate plant communities to the extent plant diversity and ecosystem integrity is threatened. For more information, visit our Noxious Weeds pinboard on Pintrest: http://pinterest.com/cbcocoalcreek/noxious-weeds-are-our-muse/

1% for Open Space, Crystal Pistol and Coal Creek Watershed Coalition like this.

Other Albums

Timeline Photos
121 photos

Beaver Dams of the…
23 photos

Coal Creek Watersh…
25 photos

Coal Creek Happeni…
124 photos

Cover Photos
22 photos

Wildflowers of the W…
113 photos

See More

Mobile Find Friends Badges People Pages Places Apps Games Music
About Create Ad Create Page Developers Careers Privacy Cookies Terms Help

Facebook © 2014 · English (US)

Search

Come on in!
Join Pinterest today...it only takes like a second or so.

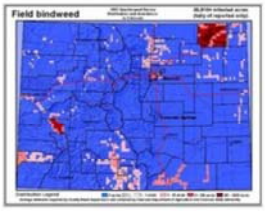
Join Pinter

More like this: **thistles**, **perennials** and **weeds**.

Noxious Weeds are our muse

Noxious weeds threaten valuable wildlife habitat and natural resources, cause economic hardships to agricultural producers, and are a nuisance for recreational activities. The Noxious Weed Act requires all Colorado residents to control noxious weeds using integrated methods to manage noxious weeds. According to the High Country News, noxious weeds infest over 100 million acres of North America. Meet Hoary Cress, Leafy Spurge, Absinthe Wormwood, Yellow Toadflax and others!

Coal Creek Watershed Coalition | Follow Board | 58 Pins



Field bindweed (Convolvulus arvensis) is a non-native deep-rooted perennial that reproduces from seed and creeping, horizontal roots (rhizomes). Field bindweed stems are prostrate (grows low to the ground) and twining, and grow up to 6 feet long. Leaves are distinguishable by their arrowhead shape. The flowers are bell or trumpet-shaped, white to pink in color, and are about 1 inch long. Field bindweed seeds can remain viable in the soil for up to 40 years.

Pinned from colorado.gov

Field bindweed's root system is quite extensive, with both lateral roots and deep vertical tap roots, which are the greatest component of field bindweed's competitive ability. This extensive root system, which can reach depths of up to 9 meters, helps the bindweed to withstand severe drought conditions. Another competitive ability that field bindweed possesses is the seed longevity. The seeds can remain viable for up to 50 years in the soil, and at least 30 years.

Pinned from colorado.gov

Field bindweed is an aggressive competitor that highly decreases crop yield while increasing input cost. For example in a wheat ecosystem Field Bindweed can cause up to a 30% profit loss per bushel by out-competing or choking out a wheat plant. (References; NCAP, OKSTATE, Invasive Species.Gov)

Pinned from colorado.gov

Russian knapweed is allopathic; it contains a toxic substance that inhibits the growth of competing plants. This weed may also be toxic to horses, resulting in serious injury or possibly death of the animal.

Pinned from colorado.gov

The flowers of Ru are urn-shaped, p color, and are sol the upper branch distinguished fror knapweeds by th tips of the rounde surround the flow knapweed emerg after soil tempera above freezing. R reproduces prima system. Buds on roots can form ac that can grow to b plants.

Pinned from colorado.gov

In the U.S., perennial pepperweed occurs in a few states along the eastern seaboard, in several midwestern states, and in all far western states. Plants database provides a state distribution map of perennial pepperweed. It is also found in Quebec, western Canada, and Mexico. Perennial pepperweed has greatly increased in distribution and dominance in western North America during the past two decades.

Pinned from colorado.gov

Pepperweed reproduces both by seed and vegetatively by roots and shoots. Root fragments as small as 0.5 inch can grow into new plants. A serious threat, pepperweed alters ecosystems by acting as a "salt pump" absorbing salts from deep in the soil. The plant then excretes the salt through the leaves and deposits it on the surface soil. Since most desirable plants do not tolerate high saline concentrated soils, the entire plant composition and diversity of the area changes.

Distribution of common mullein in the United States.

1

Pinned from invasive.org

Russian knapweed (Acroptilon repens) is a non-native deep-rooted perennial that spreads by aggressive, creeping, horizontal roots (rhizomes) and seeds. The roots are black with a scaly appearance. Russian knapweed can grow up to 3 feet in height. The stems and leaves are covered with short, stiff hairs.

Pinned from colorado.gov

Perennial Pepper invasive herbace can invade a wide including riparian marshes, and floc readily to natural wetlands.

Pinned from colorado.gov

States that have Dame's Rocket listed as a noxious weed.

1

Pinned from plants.usda.gov

Dame's Rocket is considered an invasive species in some areas; three U.S. states have set the following legal status for it: Colorado: noxious weed (on B-list), with plans for eradication or management varying by area and year Connecticut: invasive and banned, e.g. illegal to move, sell, purchase, transplant, cultivate, or distribute Massachusetts: prohibited

1

Pinned from colorado.gov

Plumeless thistle rosettes have wavy leaves with yellow spines along the white-colored leaf margins. The stems are covered with leaf-like, winged spines that extend up to the flowering heads. The flower heads, in clusters of 2 to 5, are alone at the end of the branches. They are purple to dark red in color and are 1/2 to 1 inch in diameter. Leaves are alternate, stalk-less, hairy underneath and blend into the stem.

Pinned from colorado.gov

Uploaded by Coal Creek Watershed Coalition

Check any "wildflower" seed packets you may purchase to ensure that they do not contain Dame's Rocket seeds. You can cut the flower heads off established plants after bloom so the plants do not set seed, or hand pull the plants. If plants are pulled while in bloom, do not compost them, as the seeds can still ripen and spread. Bag the plants for landfilling, or burn them. Do not allow the plants to dry before burning, as seedpods may burst open and spread seeds when dried.

Pinned from colorado.gov

Plumeless thistle is one of the most aggressive thistles, due to its high seed production. Mature plants can produce upwards of 9,000 seeds. The seed viability for plumeless thistle is unknown; the site must be monitored for at least 10 years after the last flowering adult plants have been eliminated and treatments repeated when necessary.

Pinned from colorado.gov

from NPR.org

In Arid West, Cheatgrass Turns Fires Into Infernos

In Arid West, Cheatgrass Turns Fires Into Infernos | Click to read this **NPR.org** story on how non-native cheatgrass is changing the fire landscape of the Great Basin,

Because of common mullein's germinative powers, and because the plant is an extremely prolific seed bearer (each plant produces hundreds of capsules, each containing up to 700+ seeds, with a total up to 180,000 or 240,000 seeds), it remains in the soil seed bank for extended periods of time, and can sprout from apparently bare ground, or shortly after forest fires long after previous plants have died.

Pinned from colorado.gov

States that have plumeless thistle listed as a noxious weed.

Pinned from plants.usda.gov

Ripened cheatgrass-- when plants are green, animals will graze as forage. When the plant dries, the sharp seed can injure grazing animals getting caught in the mouth, most and eyes of the animal. It is a competitive grass with native grasses and forbs because it germinates in the fall and will over winter as a seedling.

Pinned from colorado.gov

Control of common mullein, when desired, is best managed via mechanical means, such as hand pulling and hoeing, preferably followed by sowing of native plants. Animals rarely graze it because of its irritating hairs, and liquid herbicides require surfactants to be effective, as the hair causes water to roll off the plant, much like the lotus effect. Burning is ineffective, as it only creates new bare areas for seedlings to occupy.

1

Pinned from colorado.gov

The flowers of Dame's Rocket appear from May to August and the plant can produce seeds and flowers on any flower cluster at the same time. The fruits are long, narrow and cylindrically shaped that contains many seeds. The seeds are small, angular, grooved and dark reddish brown. The seed pods are about 1 ½ inches long and very narrow. Leaves are slightly hairy, alternate, and 2 to 4 inches long. The leaves are lance shaped with toothed margins.

1 1

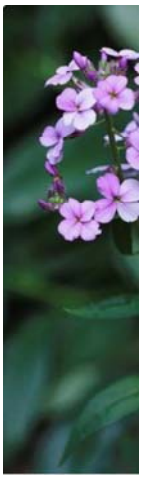
Pinned from colorado.gov

Downy brome or Cheatgrass is an annual that ranges in height from 2 to 36 inches. Each plant contains multiple stems that are erect in nature. The inflorescences are born and the end of the stems, and are multi-branched. At maturity, they appear greenish purple in color. Cheatgrass reproduces solely by seed. The root system is fibrous and fleshy.

Pinned from colorado.gov

Common mullein seeds only; seeds germinative powe to a hundred yea some studies. Nu chambered fruits to 250,000 seeds

Pinned from colorado.gov



Dame's Rocket is caterpillars of sev species, including Anthocharis card White Pieris bras Pieris rapae, and Plutella porrectell

by Dope on the

Pinned from colorado.gov

from The New Y

Out West, 'Blac Death' Offer Ho Invader

A Fungus Emerg Against invasive NYTimes.com

Pinned from nytimes.com

Search

with quotes from USGS WERC scientist Matt Brooks.

Pinned from npr.org