

# 中国西北荒漠区持续农业与沙漠综合治理

国际学术交流会论文集

PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON  
SUSTAINABLE AGRICULTURE AND INTEGRATED DESERT  
CONTROL IN THE DESERT FRINGES OF NORTHWEST CHINA

甘肃省治沙研究所

王继和 主编

兰州大学出版社

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# 中国西北荒漠区持续农业与沙漠综合治理 国际学术交流会

1997年11月3日~8日

中国·甘肃·武威

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**International Symposium on Sustainable  
Agriculture and Integrated Desert Control In the Desert  
Fringes of in Northwest China**

November 3~8, 1997

Wuwei, Gansu, China

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## 内容简介

本书为 1997 年 11 月在甘肃省武威市举办的“中国西北荒漠区持续农业与沙漠综合治理国际学术交流会”的论文集,它主要反映联合国开发计划署(UNDP)援助甘肃省治沙研究所的项目“甘肃沙漠综合治理与持续农业”(CPR/91/111)的研究成果,同时汇集了近几年来我国北方有关科研院(所)、大专院校在持续农业与沙漠综合治理方面的部分最新科研成果。同时,还包括了部分国外同类研究方面有价值的方法和经验。内容主要涉及荒漠地区农业的可持续发展(包括可持续发展的农业技术体系及荒漠地区农业系统的重要构成单元土地、水资源等的合理配置与可持续利用),荒漠区农业可持续发展的主要限制因子之一——荒漠化以及如何用持续发展的理论指导荒漠化的治理。此外,讨论了植物与环境、植物保护、资源综合开发利用等。本书反映了目前我国荒漠地区持续农业发展与沙漠综合治理研究方面的新成果,特别体现了荒漠化综合治理研究的最新思路与方法。

本书适于从事农业、林业、治沙和畜牧业等的生产、科研及技术推广人员以及有关大专院校的教师、学生等阅读与参考。

**STATEMENT ON THE OCCASION OF THE OPENING  
CEREMONY OF THE INTERNATIONAL SYMPOSIUM ON  
SUSTAINABLE AGRICULTURE AND INTEGRATED DESERT  
CONTROL IN THE DESERT FRINGES OF NORTHWEST CHINA**

*Stephan Baas*  
*UNDP Representative*  
4 November 1997

Mr. Chairman, Distinguished Guests and Participants, Ladies and Gentlemen!

On the occasion of the opening of the International Symposium on Sustainable Agriculture and Integrated Desert Control in the Desert Fringes of Northwest China, I would like to express my best wishes to all the guests and participants from China and the world.

UNDP attaches great importance to the CPR/91/110 Programme "Agricultural Development in Arid and Semi-arid Areas of Northwest China " of which the present project CPR/91/111 "Integrated Desert Control and Sustainable Agriculture" is an important element.

The objectives of the overall programme are to assist in alleviating poverty through the improvement of agricultural production and rural incomes; to help improve the agro-environmental conditions in the programme area and to contribute towards the region's self-sufficiency in grain. In addition, UNDP attaches great importance to the improvement of women's situation through skill up-grading, income enhancement and more active participation in household and community decision making.

The Northwest Arid and Semi-Arid Agriculture Programme, funded by UNDP and with counterpart contribution from the Government of China, contains five technical component projects and a programme support. Whilst the focus and methodology of each project is necessarily different, they all share a common goal-

that of poverty alleviation in Northwest China. Each project has an important role in the development of the region's economy whilst at the same time maintaining linkage with each other. In this way although being separate, they can influence and support each other in order to speed up regional poverty alleviation and economic development.

Irrigated agriculture plays a vital role in poverty alleviation and economic development of Northwest China. Whilst the region has significant surface and underground water resources, these are being overexploited. In addition, the fragile environment of Northwest China is degenerating, with the spread of soil salinity, increasing desertification and continued desert encroachment.

The work of project CPR/91/111 "Integrated Desert Control and Sustainable Agriculture" is therefore of great significance both for Wuwei Prefecture and other desert fringe areas of the Northwest Region. It is vital that new technologies and crop varieties, that are adapted to the harsh desert conditions, are developed so that water is conserved, the advance of desertification is stopped and that environmentally and economically sustainable systems of integrated agricultural production are developed.

This symposium will give an opportunity for delegate from China and overseas to discuss the project's results and give to the Gansu Desert Control Research Institute the benefits of their experiences of similar conditions and problems elsewhere. This will enable the Institute to more effectively carry out its work of developing farming systems and rangeland resource management, integrated with desert control, more effectively to the ultimate benefit of the farmer.

I wish the symposium great success.



# 在“中国西北荒漠区持续农业与沙漠综合治理国际学术交流会”开幕式上的讲话

Stephan Baas

联合国开发计划署驻华代表

1997.11.4

主席先生、各位尊贵的客人、女士们、先生们：

在“中国西北荒漠区持续农业与沙漠综合治理国际学术交流会”开幕式上，我谨向来自中国及世界各国的客人表示良好的祝愿！

联合国开发计划署对 CPR/91/110 方案——“中国西北干旱半干旱区的农业发展”给予了很大的关注，CPR/91/111“综合治沙与持续农业”是 110 方案的一个重要组成部分。

110 方案的目标是：提高农业生产，增加农民收入，从而消除贫困；努力改善项目区的农业生产条件，使其达到粮食自给。除此之外，UNDP 还致力于通过加强技术，增加农村妇女的收入，鼓励农村妇女积极参与社会活动及事务决策等手段来提高妇女在社会中的地位。

CPR/91/110，西北干旱半干旱农业发展项目由 UNDP 资助，并得到中国政府的大力协助，它下设五个技术性子项目和一个协作子项目，尽管不同子项目的工作重点及活动策略都不尽相同，但它们有一个共同目标：使中国西北人民摆脱贫困。各项目在本地区经济发展中都发挥着举足轻重的作用，同时，它们又互有联系，共同致力于共同目标的实现。尽管各项目都是独立的，但它们又互相影响、互相帮助，共同为扫除贫困及发展经济奋斗。

灌溉农业在中国西北的脱贫及经济发展中发挥着至关重要的作用,尽管项目区的地表水和地下水资源比较丰富,但由于过度利用,水资源正日渐匮乏。同时,由于土壤盐碱化的不断发展,沙漠化危害的不断加剧,西北脆弱的生态环境正日趋恶化。

因此,CPR/91/111 项目“综合治沙与持续农业”所开展的工作,无论对于武威地区,还是西北其它风沙地区都显得非常重要。而 111 项目工作中最为重要的是:引进适于沙区恶劣条件的技术、动植物品种,这样不仅可以节水,还可以阻止沙漠的进一步前移,以及使持续、综合的农业生产系统在环境上和经济上都得以长足发展。

这次学术会议为来自世界各地的专家探讨、研究项目成果提供了一个很好的机会,也使甘肃省治沙研究所在学习、借鉴其他类似地区的经验方面受益匪浅,还有助于治沙研究所进一步在沙漠治理、农业系统发展和草场管理卓有成效地工作,也有助于项目区的广大农民成为项目的最终受益者。

预祝大会圆满成功!

**STATEMENT ON THE OCCASION OF THE OPENING  
CEREMONY OF THE INTERNATIONAL SYMPOSIUM ON  
SUSTAINABLE AGRICULTURE AND INTEGRATED DESERT  
CONTROL IN THE DESERT FRINGES OF NORTHWEST CHINA**

*Ajmal M. Qureshi, FAO Representative in China*

4 November 1997

Mr Chairman, the Gansu Desert Control Institute project staff members, distinguished participants, Ladies and Gentlemen!

First of all, I would like to extend my congratulations to project staff of CPR/91/111 “integrated desert control and sustainable agriculture” for organizing this International Symposium on Sustainable Agriculture and Integrated Desert Control in the Desert Fringes of Northwest China.

It is a privilege to participate in this important event which should be considered as a milestone in the life of CPR/91/111 project. In the past weeks, two other projects CPR/91/112 Agriculture Education and CPR/91/114 Research, Demonstration and Extension of Rainfed Agriculture have also conducted their symposia. All these events are very important in presenting the achievements of the overall CPR/91/110 programme up to now and exchanging information on agricultural development in arid and semi-arid areas in Northwest China.

The CPR/91/110 programme Agricultural Development in Arid and Semi-Arid Areas of Northwest China started in late 1993. The four major objectives of the programme are:

- \* to assist in alleviating poverty through the improvement of agricultural production and rural incomes.
- \* to help improve the agro-environmental conditions in the programme area through the development and introduction of sustainable and economically viable

techniques and systems of crop production, grazing management and irrigation.

- \* to contribute towards the region's self-sufficiency in grain.

- \* to improve the participation of women in all areas of agricultural development.

Although the Gansu Desert Control Research Institute has a long and distinguished record of working to prevent desert encroachment, it is only relatively recently that it has been given the mandate to undertake development, demonstration and extension for agricultural production in desert fringe areas. Within the context of the major objectives of the overall programme, the CPR/91/111 project has worked on the development, demonstration and extension of new farming techniques to increase grain as well as livestock production in sustainable ways as well as improving grazing resource management. Farmers in the project's counties are being trained in the new farming technologies which are important in increasing production and income in difficult environmental conditions.

The support from the Government of China, UNDP and FAO to a project like CPR/91/111 in which sustainable agriculture, poverty alleviation and participation of women are central themes is indeed of critical importance. These days, governments find themselves confronted with the environmental price of agricultural production and development. Loss of natural vegetation and biological diversity, soil erosion and surface and ground water depletion are all results of intensive agricultural practices. The loss of quality and quantity of natural resources is particularly detrimental in poorer areas whose economies are more dependent on natural resources and are thus more vulnerable.

In the northwestern region of China, irrigated agricultural production takes place in a fragile environment, facing loss of quality and quantity of natural resources. It often provides the only source of income to farmers which is rather low and poverty persists. Research results have helped in identifying sustainable agricultural techniques which can improve the situation for the farmers in the region. Even though demonstration and extension of techniques have already started in the project counties taking into account women as well as men farmers,

the transfer of technologies needs to be further extended to other counties. The impact of new technologies on farmers income in a broader area than the project's counties will certainly lead to a more widespread poverty alleviation through sustainable agricultural techniques.

This symposium will serve as a platform for exchange of information on sustainable agricultural techniques, sustainable development of irrigated farming and rangeland resource management. Participants from overseas and from China are gathered here to share their experiences for mutual benefit. I am confident that the symposium will be extremely beneficial for all those working in the fragile environment of the Northwestern region and that it will also benefit the farmers. The lack of information about experience and new techniques is often an important problem. Researchers and extensionists are facing which is also hampering the development of agriculture.

The high priority the government of People's Republic of China attaches to sustainable agricultural development is indeed encouraging. China faces an enormous challenge for sustainable development with important components of food security, control of pollution, poverty eradication and sound natural resource management. However, the efforts of the project staff of CPR/91/111 and the farmers in the spirit of their fullest participation shows the determination on different levels to achieve this goal.

Mr. Chairman, thank you for affording me the opportunity to address this distinguished gathering today.

# 在“中国西北荒漠地区持续农业与沙漠综合治理国际学术交流会”开幕式上的讲话

Ajmal M. Qureshi

联合国粮食与农业组织驻华代表

1997.11.4

主席先生、各位尊贵的客人、甘肃省治沙研究所的全体成员、先生们、女士们：

首先我谨向 CPR/91/111 项目“甘肃沙漠综合治理与持续农业”的全体工作人员为举办此次“中国西北荒漠区持续农业与沙漠综合治理国际学术交流会”表示诚挚的感谢和热烈的祝贺！

我为能参加这样一个重要的学术会议深感荣幸，它算得上是 111 项目工作中的一个重大里程碑。过去几周，112 项目和 114 项目也举办过类似的学术会议，所有这些学术会议，对展示其项目实施成果及使他们在西北干旱半干旱农业发展领域彼此交流经验都十分重要。

CPR/91/110 项目“中国西北干旱半干旱农业发展”始于 1993 年，其主要目标有下列四个：

- 增加农牧民收入，使其摆脱贫困
- 引进、发展在经济上可行的、能持续发展的作物生产、畜牧业管理和节水灌溉的先进技术，从而改善项目区的农业生态环境
- 努力使项目区粮食生产达到自给
- 增强农村妇女在农业生产各个领域的参与意识

尽管甘肃省治沙研究所在沙漠治理方面已有较长的历史和突出的成绩,但其在风沙沿线地区进行农业生产的开发、示范和推广这一工作是在近几年才开始的,在 CPR/91/110 总方案目标指导下,CPR/91/111 项目一直致力于新农业技术的研究、示范和推广,从而达到增加粮食和畜牧业产量,改善项目区的草场资源管理。项目实施当中,用农业生产新技术培养了一大批农民,这对他们在恶劣的生态环境中提高生产,增加收入非常重要。

中国政府、UNDP 和 FAO 对 CPR/91/111 这种致力于持续农业发展,扶贫和妇女参与发展项目的支持协助,对项目区经济发展发挥着至关重要的作用。目前政府部门发现他们在农业生产发展方面正面临着环境日趋恶化的问题,自然植被和生物多样性的减少,水土流失及地下水位的降低,这都是集约化农业发展的结果。自然资源的恶化、减少对那些主要靠自然资源发展经济的贫困地区尤为不利。

中国西北地区的灌溉农业生产环境非常脆弱,当地农民的农业生产收入很低,自然资源的退化、减少问题很严重。项目致力于持续农业发展方面的研究,有助于改善本区农民的生活条件,尽管在项目区已进行了农业新技术的示范推广工作,但这些新技术需在项目区外的其它地区推广,这样,新技术的推广不仅可使项目区农民、还可使其他地区农民受益,从而使更大范围地区的人民摆脱贫困。

这次大会为来自各国的专家学者提供了一个很好的机会,使他们得以在持续农业发展技术,灌溉农业的持续发展及草场管理各个领域彼此交换信息,交流经验并从中受益,我相信此次学术会议会使工作在西北风沙线的科研工作者及当地农民受益匪浅。在新技术和工作经验交流方面缺乏信息,这是研究人员和推广人员面临的

一个严峻问题,也是农业发展的一个阻碍因子。

令人欣慰的是,中国对持续农业发展给予了高度的重视。目前中国对持续发展方面,包括粮食自给、控制污染、脱贫及自然资源的合理利用等领域都面临着严峻的挑战。然而,从 111 项目人员所付出的巨大努力,以及项目区农民对农业发展的全身心投入上,我们相信上述目标肯定能够实现。

最后,感谢主席先生提供机会让我作此发言。



# 团结协作为沙漠综合治理 与持续农业发展再做贡献

——在“中国西北荒漠区持续农业与沙漠综合治理  
国际学术交流会”上的欢迎词

甘肃省治沙研究所 所长 王继和

尊敬的各位领导、女士们、先生们：

经过近半年时间的准备，“中国西北荒漠区持续农业与沙漠治理国际学术交流会”今天在这里隆重开幕了，请允许我代表甘肃省治沙研究所，并以我个人的名义，向大会召开表示热烈的祝贺！向参加会议的领导、专家表示热烈的欢迎！向给予我们工作大力支持和热情指导的联合国开发计划署驻华代表处、联合国粮农组织驻华代表处、中国国际经济技术交流中心、中国农业部表示衷心的感谢！对始终关心支持我们工作的省林厅、省外经厅、省科委、省计委、武威地区表示衷心的感谢！对工作长期与我们团结协作的民勤县、武威市、临泽县等表示诚挚的谢意。

众所周知，荒漠化所造成的环境恶化和经济危困被列为当今威胁人类生存的十大问题之首。它不仅威胁到整个人类生存环境，而且也是制约全球经济可持续发展和影响社会稳定的重要因素。目前全球陆地面积的 36% 已被沙漠和沙漠化土地所覆盖，其危害涉及全球人口的六分之一，直接经济损失每年约有 420 亿美元。我国是世界上荒漠面积较大，危害严重的国家之一。甘肃省又是中国沙